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Role of Consumer Vanity in Driving the Conspicuous Consumption Behavior: The Moderating Effect of Gender

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Abstract

This research aimed to understand the development of conspicuous consumption behavior among consumers of fashion clothing brands. The study examined the influence of psychological variables physical vanity, achievement vanity, private consciousness, public consciousness, and brand consciousness on the formation of conspicuous consumption. The gender is conceptualized as a moderator that moderate all the structural relationships between physical vanity, achievement vanity, private consciousness, public consciousness, and brand consciousness. A total of 426 respondents (193 males and 233 females) participated, with data collected through both self-administered questionnaires and web-based surveys. PLS-SEM was used for analysis due to its superior predictive capability with complex theoretical models. Results confirmed positive relationships between the constructs, although private self-consciousness did not significantly contribute to conspicuous consumption. Additionally, gender was found to moderate the proposed relationships. The study develops and validates a theoretical model that helps to explain the psychological motivations driving conspicuous consumption in developing countries, along with the relative influence of each variable. The target audience was limited to students from tertiary-level institutions in Punjab, Pakistan, which may limit the generalizability of the findings.

Keywords: Physical Vanity, Achievement Vanity, Self-Consciousness, Conspicuous Consumption

Introduction

A prominent trend of luxury consumption, characterized by the use of products belonging to well-known and prestigious brands, has been observed among the general public in recent years more than ever. In contrast to a logical as well as prevalent belief, this demand is also originating from developing economies like China, India, and Brazil (Bhar et al., 2022) because the consumption of products that symbolize the characteristics of luxury is becoming the regular style of living and spending in developing economies too. Such ostentatious consumption is fueled by materialism is widely prominent among Pakistani consumers like other customers belonging to the developing and developed economies (Ahmed et al., 2023; Dev et al., 2018). In response, businesses try to target middle-class consumers by mass-producing the products that are perceived and classified as luxury by middle-class consumers through the adoption of an approach that scholars are now referring to as “masstige” (from prestige and mass) marketing (Kumar et al., 2020). However, the question of why middle and lower-class consumers from developing economies are adopting behavior (similar to) conspicuous consumption by seeking products that offer luxury value remains unanswered (Awais, 2014; Barrera & Ponce, 2021).

Few attempts have been made to answer this behavior. For instance, Sharda et al. (2019) studied the role of vanity (physical and achievement) and brand consciousness in driving attitudes towards the purchase of luxury products. Similarly, Barrera and Ponce (2021) studied personality traits (e.g., competitiveness, materialism, etc.) to predict conspicuous consumption. Also, the outcomes of contemporary studies have consistently stressed the importance that consumers’ psychological variables hold for justifying conspicuous consumption (Dhaliwal et al., 2020). This is because the major rationale for rising interest in luxury goods could be the need to satisfy one’s own egoistic and social goals through the consumption of products that offer social value (Saruchera & Mthombeni, 2023). This is one of the many possible reasons that customers in Pakistan are shifting from the traditional ‘bazaar’ setting that promises affordable prices toward the shopping, to the megamall settings. These megamalls are positioned using the value propositions which mainly focus on delivering superior quality of symbolically visible products blended with a shopping experience. This positing strategy ensures classy shopping environment for customers to

purchase fashion and clothing brands (Iqbal et al., 2022).

Much research has emerged in recent years in Pakistan's textile industry, especially in exploring methods to improve its efficiency in serving international markets (Mehar, 2022). However, the growth of ready-made clothing, also known as attires or apparels, brands is not fully addressed due to lack in understanding of the retail consumer market from the consumer psychological and behavioral perspectives. Despite the fact that local market has great potential and opportunity for serving these fashion-oriented customers with reduced costs. However, some key questions that scholars are yet to investigate include, (1) how do consumers view the clothing brands while deciding to purchase (2) what are the core emotional, social, psychological, and behavioral constructs that play crucial role in the decision-making process (ul Islam et al., 2022)?

Practitioners and scholars in the country are constantly evaluating methods to speed up the buyers' decision-making process in the clothing brands industry to keep up with the sales requirements of clothing brands (Ahmad et al., 2023). but practical implementation of these tools also requires clear consumer insights on a psychological level so that behavioral predictions can be made with added precision. Similar to most other businesses and markets throughout the world, impulsive buying, in-store promotions, and advertising are known to serve as a catalyst for increasing the sales of branded clothing products in Pakistan (Batoool, Awais, Rehman, Shafiq, & Dar, 2019; Nawaz, et al., 2023; Rizwan, 2023).

The most relevant psychological variables are identified from the literature for studying this market (fashion clothing) include physical vanity, achievement vanity, private consciousness and public consciousness (Giovannini et al., 2015; Huang, Kumar, & Hu, 2018; Kapoor & Munjal, 2019; Wong & Malone, 2016; Workman & Lee, 2011, 2013) and brand consciousness (Sharda & Bhat, 2019; Yi-Cheon Yim et al., 2014; Zhang & Kim, 2013). The higher ranking of fashion leaders on physical vanity, achievement vanity, private consciousness and public consciousness (Lee & Workman, 2014) solidifies the evidence for the role of these variables within fashion consumption. However, Lee and Workman (2014) pointed toward investigating the role of physical vanity, achievement vanity, private consciousness and public consciousness in understanding fashion markets of Eastern cultural countries by pointing out the need for testing the causal relationship of vanity with brand consciousness and Private Self-Consciousness as previous studies have not taken these into account. It would be beneficial to examine such relationships for a thorough understanding of fashion markets (Workman & Lee, 2013).

Taking this ahead, Sharda et al. (2019) studied the causality between vanity (physical and achievement) and brand consciousness to drive purchase intentions from luxury brands. However, the self-consciousness was again missed in this inspection and the varying preferences determined by gender differences. Such relationships are also unknown and can add rich insights to the literature on consumer behavior in fashion markets (Sharda & Bhat, 2019). As conspicuous consumption is more relevant to luxury purchases and is backed by the personality traits of the consumers (Barrera & Ponce, 2021), the current study examines the role of vanity (physical and achievement), self-consciousness (private and public), and brand consciousness (psychological variables) to drive conspicuous consumption behavior (behavioral variable) in fashion clothing markets. The mediating roles of brand consciousness, private consciousness and public consciousness are proposed in the study as the both physical vanity and private vanity directly contribute in the development of brand, private and public consciousness (Moon et al., 2022; Sardottir, 2022) that ultimately lead to the development of intentions of conspicuous consumption (Chang, 2019; Khan et al., 2023). Further, the differences that may exist between two genders in terms of motivations to consume from (perceived) luxury fashion clothing brands. To rationalize customer preference toward and purchase decisions from branded fashion and clothing brands, the study has conceptualized these brands as luxury from the customers' point of view by taking into account the *perceived luxury value* that a customer of this lower-income country intends to acquire from shopping from these brands. These perceived luxuries that customers of such brands expect to gain in the form of product attributes along with personal and social benefits (Khan, Awais, Khan, & Khan, 2017; Loureiro et al., 2020).

This research aims to provide a theoretical understanding of consumer motivations in the fashion clothing industry by developing and validating a causal model that conceptually presents the formation of conspicuous consumption behavior. Practically, this model helps marketing practitioners to design effective promotion strategies by communicating the right content which aligns with the rationales of consumer behavior highlighted. Through the help of customer understanding on a psychological level in the understudied market (geographically), the results of the study could also present an opportunity to promote the textile industry in Pakistan which not only is considered to be one of the best in the world but also has a potential to help the country's struggling economy (Jabbar, Sheikh, & Raza, 2023; Khan, Awais, & Malik, 2023; Mehar, 2022).

Literature Review

From a theoretical perspective, this research work is based on Consumer Culture Theory (CCT) (Arnould & Thompson, 2005) to study the factors that serve as the impetus to (perceived) luxury fashion consumption. Under the domain of CCT, the acquisition of products and their association with extending one's self-concept is relevant to consumer behavior (Belk, 1988; Magklaras et al., 2023). The core idea behind such extension of one's self — through the use of (and association with) products or possessions — is that consumers relate their identity with the products used (Ahuvia, 2005). Hence, they consume certain products to alter their identity and/or for creating their ideal self (Hung et al., 2011). Therefore, luxury brand consumption could be best understood by taking into account the personal as well as social-oriented motivational factors (Tsai, 2005). In this regard, vanity, self-consciousness, and brand consciousness could provide a thorough understanding of luxury consumption in the clothing market too. Referring to the nature of consumer behavior as theorized by CCT, vanity, self-consciousness, and brand consciousness provide a good conceptualization ground for testing the assertions of CCT in the fashion clothing market. Since personal and social orientated motivations (for identity creation and/or alteration to reach the desired state) to consume from luxury fashion brands are responsible for the development of purchase intentions (Dhaliwal et al., 2020; Farrag, 2017; Giovannini, Xu & Thomas, 2015; Hung et al., 2011; Janpors, Raeisi Ziarani, & Taghavi, 2023; Sharda & Bhat, 2019), these could be leading to conspicuous consumption behavior by consumers (Barrera & Ponce, 2021; Ko et al., 2019; Li et al., 2019) for the personal and social goals set by an individual.

Vanity

The term "Vanity" is defined as an enhanced, inflated, or magnified perception/view as well as the concern of a person toward his/her physical appearance and/or achievements (Netemeyer et al., 1995; Park et al., 2008; Sharda & Bhat, 2019; Workman & Lee, 2011). Two dimensions that can be delineated from the definition include Physical Vanity (PV) and Achievement Vanity (AV) (Durvasula et al., 2001; Farrag, 2017; Huang, Kumar, & Hu, 2018; Ketron & Naletelich, 2017; Park et al., 2008; Sharda & Bhat, 2019; Wang & Waller, 2006). Both dimensions are described in the light of research interest separately below.

Physical Vanity (PV)

Physical vanity is defined as excessive concern for and/or positive perception/view (perhaps an inflated one) that a person holds regarding his/her physical appearance (Cheah et al., 2015; Netemeyer, Burton & Lichtenstein, 1995; Sharda & Bhat, 2019). Efficacious qualities, prosperous careers, and happily married lives are perceived to be led by people who are physically attractive and good-looking (Eagly et al., 1991). Discriminative behavior of employers can usually be observed based on employees' physical appearance (Cavico et al., 2013). Advertising and entertainment media too, have always associated several professional and personal benefits with physical attractiveness and in doing so, brands and products that increase physical beauty are promoted (Netemeyer et al., 1995). Hence, individuals become susceptible to purchasing from luxury (and fashion) brands (Park et al., 2008) as they serve a hope for them to be acceptable and praised within social groups by becoming physically good-looking (Cheah et al., 2015). People often intentionally engage in comparisons with others based on physical attractiveness and prominent media personalities are considered to be the ultimate level for these comparisons the struggle

to achieve the desired state of physical acceptance in one's own and others' eyes often leads to fashion purchases and even cosmetic surgeries (Sigurðardóttir, 2022). These rationales behind the purchase of fashion products from the point of view of PV (specifically) might not be justified for the decision-making of customers during their purchases of counterfeit fashion purchasing but when the role of this PV is viewed for the original brands that are viewed as prestigious by the customers, the significant impact is most likely to play a significant role (Mayasari et al., 2022). Thus, for the population of this study, it would not be wrong to expect that one of the major reasons to purchase from fashion and luxury (clothing) brands is to look physically good for personal as well as social acceptance.

Achievement Vanity (AV)

Achievement vanity is an excessive concern and/or positive perception/view (perhaps inflated one) regarding one's abilities and professional accomplishments (Huang, Kumar, & Hu, 2018; Netemeyer et al., 1995; Sharda & Bhat, 2019; Wang & Waller, 2006). AV has very close ties with luxury consumption because consumers use expensive products to communicate their financial status. It plays a significant role in the consumer's decision-making processes during the purchase (Netemeyer et al., 1995). Just as PV is closely related to materialism, AV is strongly correlated with price-based prestige sensitivity (Chang et al., 2008). When it comes to the formation of the advertising appeal of luxury products (including dresses), the impact of such advertisements is much more likely to develop a positive intention to buy among the consumers who want to show their achievements by the possession of that product (Lewis & Moital, 2016) as people gather wealth primarily to purchase expensive products for demonstration (Husain et al., 2020). This contributes to the goals of self-presentation and status communication within society (Nezlek et al., 2019). Similarly, self-concept-related values which also include vanity, self as well as brand consciousness are some of the predictors of compulsive buying including purchases from fashion and clothing brands in Pakistan (Moon et al., 2022).

Self-Consciousness

Self-Consciousness is defined as the direction of thoughts/attention of the person toward his own (inner and/or outer) self (Fenigstein et al., 1975; Fenigstein, 1979; Ruganci, 1995). It is a focus of an individual towards one's self (Lee & Workman, 2014). Unlike self-awareness, which is the increased awareness of one's self, self-consciousness is more of self-examination. Self-consciousness is a variable that is involved in the decision-making of the person in terms of the acquisition and consumption of products (Giovannini et al., 2015). The major two dimensions of self-consciousness include private self-consciousness and public self-consciousness (Chang, 2019; Fenigstein, 1979; Lee & Workman, 2014; Nezlek et al., 2019). Private self-consciousness mainly consists of the aspects of the individual's personality that are not observed by or shared with other people (Chang, 2019; Fenigstein et al., 1975). Self-esteem, which by definition, can be related to PrSC was found to be positively related to purchase-related variables including conspicuous consumption (Giovannini et al., 2015). The efforts of an individual to look good (reflecting vanity concerns) result in behaviors plastic surgery, luxury brand consumption, etc. (indicators of conspicuous consumption) that can be closely linked to private and public dimensions of self-consciousness (Chang, 2019).

Public Self-Consciousness (PuSC)

Fenigstein et al. (1975) described PuSC as the state of pre-occupation of an individual toward presenting himself/herself to others. As PrSC is the person's direction of attention and concern toward exploring and satisfying himself through a connection with his inner self, PuSC can be defined as "directed attention towards the outside where an individual identifies himself/herself as a part of society and places importance over the opinions of others about himself/herself (Fenigstein, 1979; Ki & Kim, 2016; Lewis & Moital, 2016). Previous studies have asserted that publicly self-conscious individuals are more sensitive to people's rejection (Kapoor & Munjal, 2019; Nezlek et al., 2019). To gain acceptance from the reference group, publicly self-conscious individuals are more likely to purchase products that are symbolic, expensive, and more visible (Johnson, Tariq, & Baker, 2018; Vigneron & Johnson, 2004). Due to this,

PuSC is positively related to compulsive buying behavior (Xu, 2008).

However, it must also be noted that the consumers with higher SC (especially the public) are brand conscious too but are prone to avoid purchasing counterfeit brands if they are very visible to protect their self-image among their peers and other social groups (Khan et al., 2023). Thus, it is most likely that self-conscious consumers are more attracted to buy from (a) original brands even if they are not very prestigious or (b) counterfeit brands if the brand is not too visible [as a part of image management]. Brand-conscious consumers purchase from relatively expensive and well-known (publicly or socially visible) brands with the belief that higher prices reflect superior quality (Shim & Gehrt, 1996). Brand consciousness (BC) can be defined as a psychological trait due to which customer prefers goods offered by famous brands (Zhang & Kim, 2013).

Brand Consciousness

A vast number of studies has considered the variable of BC to explore the attitudinal and behavioral aspects of consumers such as purchase intention, purchase behavior, brand loyalty, luxury purchase intention, etc. (Farrag, 2017; Giovannini et al., 2015; Ismail, 2017; Liao & Wang, 2009; Johnson, Tariq, & Baker, 2018; Sharda & Bhat, 2019; Soh, Rezaei, & Gu, 2017; Workman & Lee, 2013; Zhang & Kim, 2013). This shows the importance that the construct BC holds for understanding and even predicting consumer behavior. BC is initiated due to the perception that consuming products from well-known brands enhances one's social status and provides a sense of self-worth and respect within a social group (Liao & Wang, 2009). By providing a sense of belonging to their desired social group, consumption from well-known brands facilitates the consumers for their socialization-related goals (Lachance et al., 2003; Xu & Nuangjamnong, 2022). BC could be the result of the need to communicate the status of a person to others through consuming products offered by expensive and well-known brands (Sharda & Bhat, 2019).

Conspicuous Consumption (CC)

Cummings (1899); Veblen (2017), in chapter number four of his book "Theory of Leisure Class", presented the idea of Conspicuous Consumption (CC) for the first time while elaborating on the culture and living style of the elite. CC can be defined as an exceptional consumer behavior that is characterized by the possession as well as an ostentatious display of fancy items for the sake of conveying the message of belongingness to an affluent social group through communicating the wealthy status possessed by a person (Cummings, 1899; Patsiaouras & Fitchett, 2012; Lewis & Moital, 2016; Veblen, 2017). As described by Veblen (2017), two aspects of a product include serviceability and honorific (non-utility based). The honorific aspect of the product is reflective of non-productive or conspicuous consumption. People strive to enhance the interaction process with others by using tools "consumer goods" for the sake of self-enhancement because they consider such goods or possessions as a part of their extended self (Ahuvia, 2005; Belk, 1988) and this is because they attach symbolic meanings to the consumption and possessions of goods (Grubb & Grathwohl, 1967). Consumers are believed to engage in CC behaviors through buying from luxury brands with the primary objective of expressing exclusivity of their personality so that it could contribute toward their goals of status enhancement (Li et al., 2019).

Vanity and Self-Consciousness

Studies undertaken by Workman and Lee (2011, 2013, 2014) focused on investigating the correlative relationships between vanity and self-consciousness. Individuals who score higher on the PrSC have higher vanity views and concerns (Workman & Lee, 2013). Extending this, Lee and Workman (2014) investigated the comparisons between fashion leaders and followers based on the levels of vanity and self-consciousness. Again, fashion leaders and followers scoring higher on PrSC were reported to have higher vanity views and concerns (Lee & Workman, 2014). These findings indicate a valid association between vanity and SC, and it may be possible that vanity-concerned individuals are more (privately) self-conscious. Among the scarce research that focused on consumer behavior concerning the role of SC and vanity, only a scintilla of studies has focused on both dimensions of the construct; and this has resulted in a compromised investigation of the construct's capacity for a satisfactory understanding of consumer

behavior in literature (Lopez-Bonilla et al., 2021). However, a recent study has argued that vanity concerns and views are responsible for the distortion of one's self-concept, thus giving rise to self-consciousness as a whole (Kupfer, 2021). Hence, the first hypothesis of this study assumed a positive impact of vanity on SC.

H1a: Physical Vanity positively contributes in the development Private Self-Consciousness.

H1b: Achievement Vanity positively contributes in the development Private Self-Consciousness.

In response to social pressure, women wear more make-up in an effort to enhance their physical appearance and social acceptance (Miller & Cox, 1982). Individuals who are highly publicly self-conscious are more sensitive toward public opinion and to gain positive opinions, they use (luxury) fashion-related products (including clothes) to enhance their physical appearance (Nia & Lynne Zaichkowsky, 2000). Highly self-conscious consumers purchase from luxury brands to achieve their ideal self-concepts and communicate their superior status to others in the social group (Kumar et al., 2020). Such behaviors could also be forerunners of self and status consciousness (Husain et al., 2022). Based on this, it was hypothesized:

H1c: Physical Vanity positively contributes in the development of Public Self-Consciousness.

H1d: Achievement Vanity positively contributes in the development of Public Self Consciousness.

Vanity and Brand Consciousness

It is evident from both theoretical and applied bodies of marketing, sociology, and psychology literature that consumption patterns are related to the achievements of the consumer (Husain et al., 2020; Netemeyer et al., 1995). This means AV affects an individual's brand selection because one of the characteristics of a luxury brand is the symbolic value that it delivers to the consumer (Ko et al., 2019). Also, the enhancement of physical appearance is the key driver for the formation of purchase intention and behavior toward luxury brands (Cheah et al., 2015; Farrag, 2017). High fashion conscious consumers are more likely to purchase from luxury brands especially when it comes to the selection and purchase of clothing (Tak, 2020). Another motivation for consuming from luxury brands is the satisfaction of one's vanity views and concerns (Siyao, 2021). Vanity is one of the prominent factors to drive the consumer's intention to purchase from (perceived) luxury brands (Xu & Nuangjamnong, 2022) and these consistent preferences toward visible original brands are most likely to make consumers more and more brand-conscious. All these shreds of evidence from different industries indicate the primary relevance of vanity in influencing the individual's BC. Hence,

H2a: Physical Vanity positively influences Brand Consciousness.

H2b: Achievement Vanity positively influences Brand Consciousness.

Self-Consciousness and Conspicuous Consumption

Since publicly self-conscious people are more concerned about others' opinions and consider themselves as a social object (Xu, 2008), they try to present themselves in a way by which others can accept them and consistently try to establish a favorable public image (Fenigstein, 1979). In doing so, they use consumer goods (Burnkrant & Page, 1982) belonging to expensive brands (Tolbert et al., 2014) to form their desired image (Fenigstein, 1979) as a part of their self-presentation (enhancement) strategy (Doherty & Schlenker, 1991). Higher PuSC translates into a higher tendency to consume conspicuously in the fashion and clothing market (Lewis & Moital, 2016). Following the desire to signal superior status to reference groups, consumers engage in CC by purchasing from well-reputed brands (Sharda & Bhat, 2019). PuSC is directly linked to the individual's tendency to purchase from luxury brands (Xu, 2021) and this tendency is related to conspicuous consumption behavior. Beyond gaining social acceptance by consuming from symbolic brands, the consumer's agenda for purchasing from luxury brands also stemmed from the effort to avoid any public embarrassment that indicates PuSC (Balabanis & Stathopoulou, 2021). Following this, it was proposed that:

H3a: Public Self-Consciousness positively contributes in the development of the Conspicuous Consumption.

Similarly, individuals can also turn toward branded products to satisfy themselves. Other than socially inspired goals, consumers are attracted to luxury clothing brands due to their emotional needs (Vigneron & Johnson, 2004). Self-satisfaction is a factor that motivates consumers to consume from luxury brands because this makes them feel good about themselves (Ko et al., 2019; Tak, 2020). This was also noted by Kapoor and Munjal (2019) who found a significant relationship between PrSC and attitude toward “Femvertising” (advertising specifically directed toward females only) which in turn leads to purchase intention from advertising brands (Kapoor & Munjal, 2019). This means that PrSC could also be the reason for consumers to adopt CC behavior. Thus,

H3b: Private Self-Consciousness positively contributes in the development of the Conspicuous Consumption.

Brand Consciousness and Conspicuous Consumption

Products from luxury brands are used by consumers as a part of their impression management and the primary motive for buying such products is to impress others through the display of status and wealth (Tsai, 2005). Consumers who are highly concerned for and about the brands are the ones who have a high need or desire to create their superior or prestigious self-image (Husic & Cicic, 2009). One study found that susceptibility toward interpersonal influence (the need for creating and amplifying one’s image in front of influential others and social groups through the use of products) leads to brand consciousness which results in an attitude towards luxury [an indicator of CC] (Yi-Cheon Yim et al., 2014). Another study found that consumers who had high levels of BC also possessed a strong motivation for CC (Giovannini et al., 2015). Furthermore, as argued by Siyao (2021), luxury brands are the source of an individual’s vanity-related views and concerns which in turn makes a consumer more brand conscious; and enhanced attraction towards these luxury brands results in non-productive use of available resources (income, finance options, etc.) which ultimately feeds consumerism (Kuryshva & Vernikov, 2021) as reflected through status consumption (Husain et al., 2022). Also, as Shahid et al. (2023) noted in their study of the affordable luxury market, the conspicuous brands are the one that most likely captures the Indian customers’ attention for purchase (Shahid et al., 2023) and specifically for Pakistani customers too, like other geographical markets, brand consciousness has repeatedly been positively linked with the consumption patterns that are backed by materialistic values and status communication (Waqar et al., 2023). Thus, we hypothesized that:

H4: Brand Consciousness positively influences Conspicuous Consumption.

Gender Differences in Vanity, Self-consciousness, and Brand Consciousness

The first-ever study for the delineation of SC asserted that the stereotypes that existed about females being more self-conscious (especially publicly) might be outdated (Fenigstein et al., 1975) but the latter studies found some significant differences between genders. Private self-consciousness plays a greater role than PuSC for women during the selection of clothes (Kwon, 1991). Social desirability is also a factor due to which women in Pakistan engage in impulsive buying behavior in the apparel industry specifically (Amir et al., 2014).

When the variable of vanity is taken into consideration, it is generally believed that females are more likely to score higher on PV whereas the same is true for males when AV is taken into account (Qardottir, 2022). Females score relatively higher on the PV whereas males rank higher on AV (Huang, Kumar, & Hu, 2018). Females are more self-conscious (both privately and publicly) and score relatively higher on PV as compared to men (Lee & Workman, 2014). Similarly, males are relatively less concerned about appearance and score lower on SC than females (Workman & Lee, 2013). As per these differences in both genders in terms of self-consciousness and vanity, the following hypotheses were proposed. The conceptual model of the study is presented in Figure 01.

H5a: The relationship between Physical Vanity and Private Consciousness is moderated by Gender.

H5b: The relationship between Achievement Vanity and Private Consciousness is moderated by Gender.

H5c: The relationship between Physical Vanity and Public Consciousness is moderated by Gender.

H5d: The relationship between Achievement Vanity and Public Consciousness is moderated by Gender.

H5e: The relationship between Physical Vanity and Brand Consciousness is moderated by Gender.

H5f: The relationship between Achievement Vanity and Brand Consciousness is moderated by Gender.

It can also be inferred that woman, due to greater concerns about their physical appearance are more likely to be brand conscious as compared to men because expensive and well-known brands are believed to be capable of adding more attractiveness resulting in better presentation of self-image (O’Cass & Frost, 2002). In comparison to males, females are more sensitive toward brands and are more brand-conscious (Workman & Lee, 2013). This may result in a greater inclination of females toward symbolic brands. Hence, it was proposed that:

H5e: The relationship between Physical Vanity and Brand Consciousness is moderated by Gender.

H5f: The relationship between Achievement Vanity and Brand Consciousness is moderated by Gender.

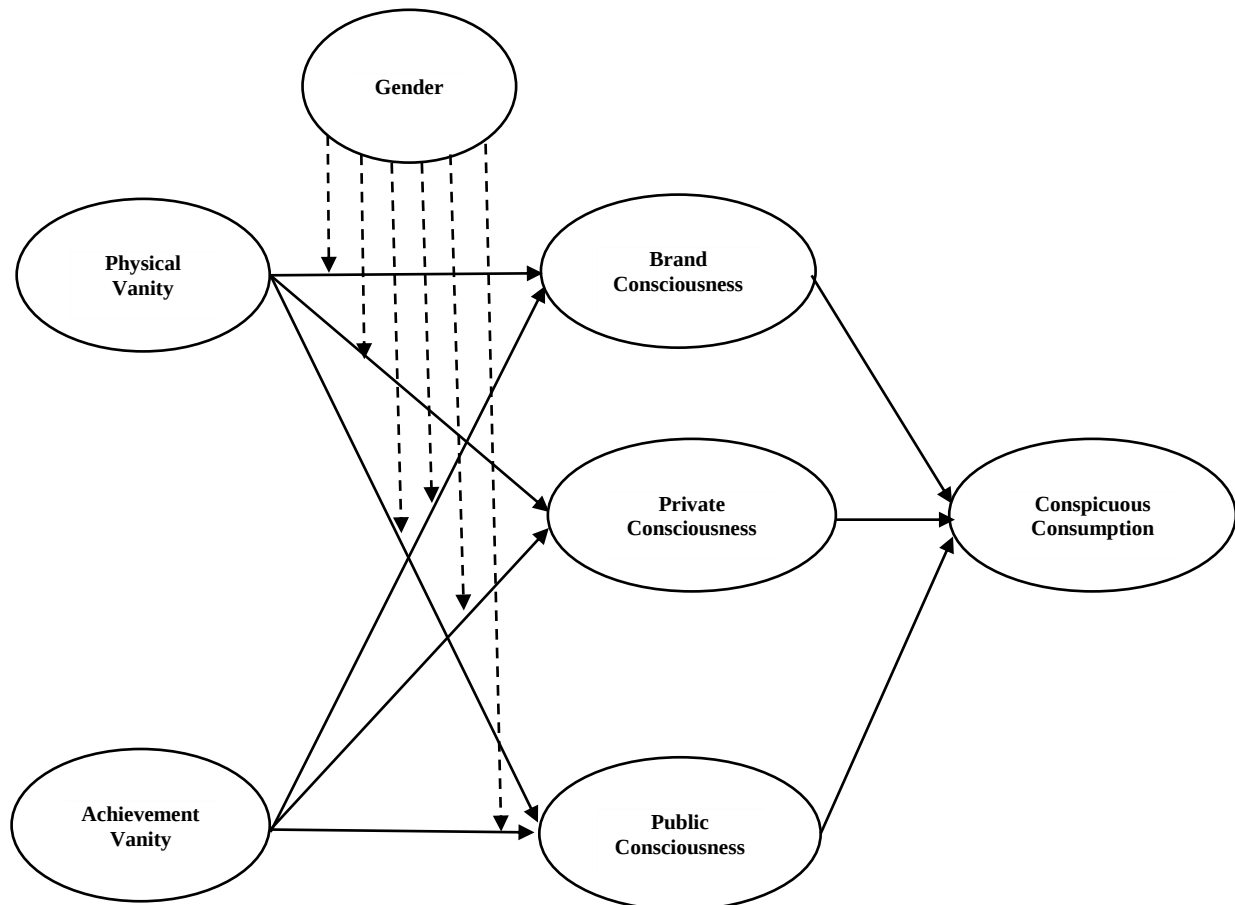


Figure-1: The conceptual model of the study

Methodology

Since the purpose of the study was to analyze consumer behavior in the fashion clothing market, the population of university students was deemed appropriate. Due to access to discretionary income, students represent the best population for studying consumer behavior (Workman & Lee, 2013). Also, university students comprise the most prominent segment that is attracted to fashion clothing brands and thus represent a significant proportion of the whole customer base of such brands. Additionally, university

students are an appropriate segment for collecting survey- based data (in Pakistan) because of their higher educational level, awareness, and knowledge of the concepts than the general public (Usmani & Ejaz, 2020). A convenience sampling technique was used to recruit 430 respondents. The sample size was calculated following the Item-response theory; according to which, items of the measurement instrument can be multiplied by 10 to obtain a suitable sample size (Hair et al., 2019). The details of the measurement instrument's items (before adaptation and item screening) are provided in Table 1.

Table 01: Sources and specifications of the adopted scales

Sr. No.	Variable Name	Source	No. of items
1.	Physical Vanity	(Hung et al., 2011)	5
2.	Achievement Vanity	(Hung et al., 2011)	4
3.	Brand consciousness	(Sprotles & Kendall, 1986)	7
4.	Private-consciousness	(Fenigstein et al., 1975)	8
5.	Public-consciousness	(Fenigstein et al., 1975)	8
6.	Conspicuous consumption	(Roy Chaudhuri, et al., 2011)	11
Total Number of Items			43

According to Spero and Stone (2004), consumers' motivations and reasons behind purchase decisions are prone to change with the change in the stage of the life cycle. Also, youngsters' purchases are mostly less conspicuous (e.g. clothing) than senior adults whose conspicuousness may be reflected by products like cars, houses, etc. (Spero & Stone, 2004). Therefore, to maintain consistency in the results, studies that focus on consumer behavior related to purchasing patterns and/or habits should target a specific age group only (Lewis & Moital, 2016). Keeping this in view, a sample was planned to be comprised of 18-35-year-old university students who shop from the clothing brands. The PLS-SEM technique was used for the data analysis and hypotheses testing because of its capability to run complex models and better predictive power in comparison to other SEM tools (Ali et al., 2018). SmartPLS 3 was used to run PLS-SEM and data was refined through data screening tools offered by SPSS version 25.

Respondent Profile

The sample is comprised of 45.3% (193) males and 54.7% (233) females with income from 0 to 500,000 Pkr/month. Table 2 presents a complete demographic profile of respondents. Data was collected through self-dissemination of the questionnaire as well as adopting online survey methods. Out of 465 responses obtained, 426 were found to be valid enough for their inclusion in statistical analyses. To ensure the quality of data, incomplete (with more than 15% missing values) and unengaged responses were highlighted and eliminated from the collected data. Additionally, by pointing out unusual response patterns, unengaged responses were also identified and discarded. Some examples of unusual response patterns include filled questionnaires with (a) single scale option selection (e.g., strongly agree) for all the items, (b) selection of more than one response (e.g., strongly agree as well as strongly disagree) for a single item, and/or (c) formation of specific shape (e.g., z-pattern) throughout the questionnaire. Furthermore, responses from the participants who highlighted themselves as not being brand-conscious were also eliminated.

Analysis and Results

As recommended by Hair et al., (2019), a two-stage analytical procedure was adopted for testing the proposed model. The first stage of analysis included the assessment of the measurement model and structural relationships were tested in the second stage of model testing (Hair et al., 2019).

Table 02: Demographic Profile of the respondents

Variable	Category	N	%	Variable	Category	N	%
Gender	Male	193	45.3	Family Income (per month)	Up to 50,000 PKR per month	90	21.1
	Female	233	54.7		Up to 100,000 PKR per month	210	49.3
	Total	426	100.0		Up to 150,000 PKR per month	53	12.4
Age	18-20 Years Old	112	26.3		Up to 200,000 PKR per month	35	8.2
	21-23 Years Old	163	38.3		Up to 400,000 PKR per month	27	6.3
	24-26 Years Old	95	22.3		More than 400,000 PKR per month	11	2.6
	27 and above	56	13.1		Total	426	100.0
	Total	426	100.0	Average spending on clothing (per month)	Up to 3,000 PKR per month	158	37.1
Preferred clothing brand	Domestic	352	82.6		Up to 6,000 PKR per month	182	42.7
	International	74	17.4		Up to 9,000 PKR per month	33	7.7
	Total	426	100.0		10,000 PKR or more	53	12.4
					Total	426	100.0

Measurement Model

Before moving on to measurement model assessment, the issue of multicollinearity needs to be checked. A variance Inflation Factor (VIF) value of lower than 5 is required for overcoming the collinearity issue (Becker et al., 2013), and the VIF values presented in Table 04 satisfy this requirement. Measurement model assessment involves analyzing the goodness of fits. For this purpose, the scale's reliability and validity were confirmed. The measurement model was found to be reliable as the values of Cronbach alpha, as well as composite reliability (CR), were greater than 0.7 (Henseler et al., 2014).

Table 03: Reliability of the measurement instrument

Sr. No.	Construct	Number of items	Cronbach Alpha
1.	Physical Vanity	5	0.816
2.	Achievement Vanity	4	0.775
3.	Private Self-Consciousness	5	0.755
4.	Public Self-Consciousness	4	0.740
5.	Brand Consciousness	6	0.865
6.	Conspicuous Consumption	10	0.922
	Overall	34	0.812

CR's value greater than 0.70, Average Variance Extracted (AVE) of 0.50 or greater, and outer loading value of 0.60 or greater (Table 04) are reflective of convergent validity (Gholami et al., 2013).

Table 04: Values of Factor Loadings, CR, and AVE of the Measurement Model for Convergent Validity

Sr No.	Construct	Item	Loading	VIF (Outer)	CR	AVE
1.	Physical Vanity	PV1	0.764	1.818	0.873	0.579
		PV2	0.814	2.277		
		PV3	0.787	2.018		
		PV4	0.686	1.31		
		PV5	0.748	1.554		
2.	Achievement Vanity	AV1	0.704	1.37	0.856	0.598
		AV2	0.806	1.6		
		AV3	0.827	1.749		
		AV4	0.749	1.497		
		PrSC1	0.685	1.459		
3.	Private Self-Consciousness	PrSC2	0.758	1.64	0.836	0.516
		PrSC3	0.767	1.444		
		PrSC5	0.651	1.225		
		PrSC7	0.687	1.287		
		PuSC3	0.784	1.464		
4.	Public Self-Consciousness	PuSC4	0.753	1.481	0.837	0.563
		PuSC6	0.785	1.506		
		PuSC7	0.675	1.27		
		BC1	0.690	1.521		
		BC2	0.832	2.25		
5.	Brand Consciousness	BC3	0.762	1.963	0.899	0.598
		BC4	0.795	2.015		
		BC5	0.765	1.801		
		BC6	0.786	1.842		
		CC1	0.724	1.772		
6.	Conspicuous Consumption	CC3	0.765	2.111	0.935	0.589
		CC4	0.747	2.036		
		CC5	0.775	2.119		
		CC6	0.764	2.093		
		CC7	0.815	2.537		
		CC8	0.72	1.81		
		CC9	0.772	2.06		
		CC10	0.79	2.273		
		CC11	0.797	2.328		

Table 05: Hetrotrait-Monotrait (HTMT) ratio for Discriminant Validity

	PV	AV	PrSC	PuSC	BC	CC
PV						
AV	0.222					
PrSC	0.734	0.431				
PuSC	0.678	0.535	0.809			
BC	0.407	0.375	0.571	0.616		
CC	0.387	0.412	0.563	0.629	0.872	

Additionally, the Fornell (1981) and Larcker criterion along with the Hetrotrait-Monotrait (HTMT) ratio and cross-loadings were used to assess discriminant validity. As presented in Tables 05 & 06, the square root of AVE for all the constructs was greater than the correlation with other constructs (Fornell & Larcker, 1981). The HTMT values were also lower than 0.9 for all variables (Teo, Srivastava, & Jiang, 2008), and all indicators loaded significantly higher on the respective constructs that they measured (as compared to other variables). The value of all indicator loadings was also greater than 0.50 (Fabrigar et al., 1999; Usmani & Ejaz, 2020) which confirmed the discriminant validity of the measurement model.

Beta coefficient (P), t-statistic, and co-efficient of determination (R^2) are checked for assessing the

relationships between the variables (Hair et al., 2019). Following this, all hypothetical relationships between the variables of the study were analyzed. The structural model output results are provided in Figure 02.

Table 06: Fornell and Larcker (1981) Criterion for Discriminant Validity of Measurement Model						
	PV	AV	PrSC	PuSC	BC	CC
PV	0.761					
AV	0.18	0.773				
PrSC	0.582	0.335	0.711			
PuSC	0.536	0.405	0.608	0.75		
BC	0.351	0.31	0.47	0.496	0.783	
CC	0.346	0.353	0.48	0.525	0.773	0.768

Both PV ($P = 0.54$, $p < 0.05$) and AV ($P = 0.237$, $p < 0.05$) were found to share a significant positive relationship with private Self-Consciousness. Additionally, the relationship of PV ($P = 0.478$, $p < 0.05$) and AV ($P = 0.319$, $p < 0.05$) was also positive with the PuSC. Thus, H1 was fully supported by data. Physical ($P = 0.304$, $p < 0.05$) and Achievement ($P = 0.255$, $p < 0.05$) vanity also showed a positive association with brand consciousness. On the basis of these results, H2 was also fully accepted. The relationship between PrSC ($P = 0.074$, $p > 0.05$) and CC was found to be positive but insignificant due to which H3a was rejected. On the other hand, PuSC ($P = 0.142$, $p < 0.05$) was found to be positively and significantly associated with CC, considering which H3b was accepted. Hence, H3 was partially accepted. Finally, the strongest predictor of CC is the BC as its relation with CC was found to be highly significant and positive. Hence, H4 was also found to be supported by the data. The effect size (Z^2) of 0.02, 0.15, and 0.35 is considered nominal, medium, and large (Cohen, 1988). Following this guideline, the effect size of PV (on BC) and AV (on PrSC) was found to be nominal whereas the effect size of AV on BC and PuSC was found to be medium. The effect size of PV on Self-Consciousness (both private and public) and of BC on CC was found to be large (Table 07).

Table-07: Hypotheses Testing Summary									
Hypothesis	Relationship	β	SD	t-value	Support	R^2	f^2	Q^2	
H1	H1a	PV>>BC	0.304	0.048	6.346***	YES	0.182	0.109	0.107
	H1b	AV>>BC	0.255	0.042	6.170***	YES		0.078	
H2	H2a	PV>>PrSC	0.54	0.044	13.949***	YES	0.391	0.398	0.194
	H2b	AV>>PrSC	0.237	0.046	5.254***	YES		0.077	
	H2c	PV>>PuSC	0.478	0.039	13.949***	YES	0.383	0.359	0.212
	H2d	AV>>PuSC	0.319	0.035	8.995***	YES		0.161	
H3	H3	BC>>CC	0.679	0.034	19.743***	YES		0.958	
H4	H4a	PuSC>>CC	0.142	0.045	3.162**	YES	0.641	0.047	0.37
	H4b	PrSC>>CC	0.074	0.041	1.752 ^{NS}	NO		0.001	

The predictive power of all independent variables was assessed through a coefficient of determination (R^2) and predictive relevance or explanatory power (Q^2) for each dependent variable. R^2 of 0.25, 0.50, and 0.75 is interpreted as small, moderate, and substantial respectively (Hair et al., 2011) whereas Q^2 value of 0.02, 0.25, and 0.50 is indicative of little, moderate, and large model's predictive power (Hair et al., 2019). Considering this, R^2 of BC (0.182), PrSC (0.391), and PuSC (0.383) were construed to be weak. However, variance in CC due to vanity, brand, and self-consciousness was found to be moderate as these variables were found to be responsible for explaining a 64.1% variance in conspicuous consumption. Additionally, the Q^2 of PrSC, PuSC, and BC was found to be small whereas the Q^2 of target variable CC was found to be moderate (Table 07).

Moderation

The categorical moderation was assessed through the technique of multi-group analysis (MGA) in SmartPLS3 software. For running MGA, requirements of minimum sample size (Hult et al., 2008; Hair et al., 2019) and measurement invariance (Matthews, 2017) were fulfilled. The results of MGA showed that the relationships between PV and PuSC ($p^{\text{male}} - p^{\text{female}} = -0.287$, $p < 0.01$), PV and BC ($p^{\text{male}} - p^{\text{female}}$

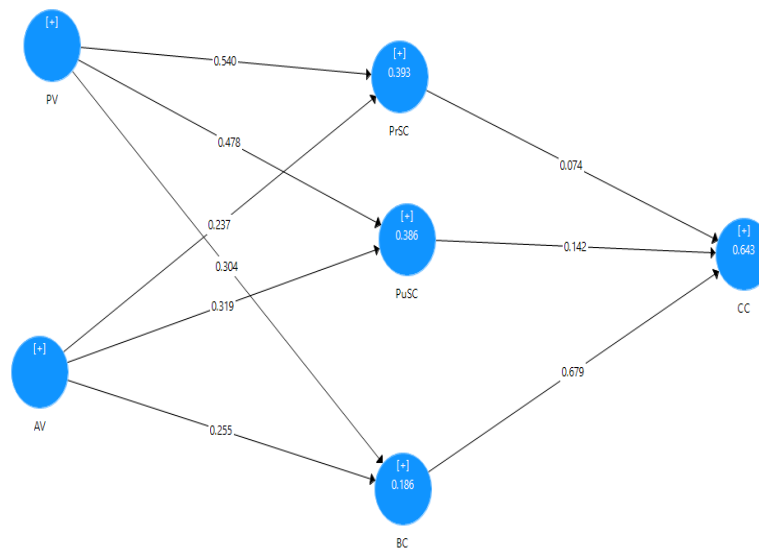
= 0.43, $p < 0.01$) and AV and BC ($p^{\text{male}} - p^{\text{female}} = 0.428$, $p < 0.01$) were found to be moderated by gender. Following this, only H5b from H5 was accepted and H6 was also fully supported by the data. All other moderating hypotheses (H5a, H5c, & H5d) were rejected. The summary of MGA results is provided in Table 08.

Table-08: Multi-Group Analysis Results for Testing of Categorical Moderation

Hypothesis	Relationship	β (Male)	β (Female)	$\beta^{\text{male}} - \beta^{\text{female}}$	t-statistic	Moderation
H5	H5a PV>>PrSC	0.427	0.557	-0.131	1.492 ^{NS}	NO
	H5b PV>>PuSC	0.304	0.591	-0.287	3.184 ^{**}	YES
	H5c AV>>PrSC	0.228	0.247	-0.019	0.195 ^{NS}	NO
	H5d AV>>PuSC	0.36	0.307	0.053	0.715 ^{NS}	NO
H6	H6a PV>>BC	0.45	0.02	0.43	4.673 ^{***}	YES
	H6b AV>>BC	0.541	0.113	0.428	5.363 ^{***}	YES

It was also found that the relationship between PV and PuSC was significantly stronger when females were taken into account whereas the relationship between vanity (both physical and achievement) and BC was stronger for males as compared to the females.

Figure-02: PLS-SEM Output Results (Diagrammatic)



Importance-Performance Matrix Analysis (IPMA)

According to Hair et al. (2019), a new dimension can be added to the overall understanding of the research by utilizing insights from IPMA. IPMA provides the relative direct as well as indirect effects of all variables on the final target variable (Hair et al., 2019) by using overall estimates of the model. The two major outcomes of IPMA are index values (which depict the importance of the variable) and performance scores (which highlight the performance of each variable (Hair et al., 2019)). As can be seen from Table 09, the most important variables are BC (0.736) and PV (0.365) as per their total effects. This means (in light of the model of study) that BC is highly responsible for triggering CC behavior and it is driven by the PV of a person. On the other hand, the performance (index value) of all variables is significantly high in determining a change in the target endogenous variable CC. Even though the variables of Self-Consciousness and BC are ranked higher for their performance, they still have little relevance if the total effects of BC and PV are taken into account.

Table 09: Total Effects and Index Values (from IPMA)

Construct	Total Effect	Index Values (Performance)
AV	0.26	62.723
BC	0.736	62.981
PV	0.365	71.637
PrSC	0.034	69.159
PuSC	0.2	69.509

Discussion

The positive relationship between PV and PrSC as well as PuSC confirms and extends the results found by Lee and Workman (2014) by establishing a positive causal link between the two constructs. This means vanity views and concerns make the individual privately as well as publicly self-conscious. Additionally, the positive association of both physical and achievement vanity with BC (found in this study) corresponds to the results of Sharda et al. (2019) who also reported the mediating effect of BC between vanity and luxury purchase intentions. This study's results extend these studies' findings by testing the collaborative effect of vanity, self-consciousness, and BC on consumption behaviors adopted by consumers. Additionally, the positive associations found between vanity and self-consciousness confirm the results of Lee (2010) and also extend the results of this study by highlighting that these relationships are also existent for males as the prior study examined data from females only (Lee, 2010).

Furthermore, the current study provides the consequences of these interactions in the form of conspicuous consumption. The causal relationship that is found between vanity and BC also extends the results of Workman and Lee (2013) which only highlighted the existence of correlative relationships between these variables. Since vanity is reflective of inflated views and concerns of the person about his/her appearance and/or achievements, luxury clothing brands provide the image of glamour by claiming the ability of the products through enhancement of physical appearance along with communicating the esteemed status of the possessor backed by prestigious brand image. This nature of brands appeals to vain consumers and justifies the positive relationship between AV and luxury purchase intention as reported by Hung et al. (2011).

The relationship of SC and BC with CC was also tested in this research by taking into account the individual effects of both dimensions of self-consciousness on conspicuous consumption. PrSC did not show any significant relationship for influencing the CC behavior in this study. The reported effects of PrSC on consumption behaviors are inconsistent across previous studies (Kapoor & Munjal, 2019; Nezlek, Mochort, & Cyprianska, 2019; Solomon & Schopler, 1982). For instance, Kapoor and Munjal (2019); Solomon and Schopler (1982) found no correlative relationships between PrSC and the formation of clothing selection but Nezlek et al. (2019) reported a significant positive association of the variable with self-presentational motives. The inconsistent results found in all those related studies including this one could be due to cultural differences. Privately self-conscious persons in different cultures may behave differently. This can be said based on the fact that all these studies (including the current one) were conducted by using the data of individuals who belonged to different cultures. However, the current study sheds light on the fact that PrSC does not play a significant role in motivating a person to consume conspicuously, especially if a consumer comes from Punjab, Pakistan.

On the other hand, PuSC showed a positive association with CC. This outcome of the study corresponds to Giovannini et al. (2015); Soh, Rezaei, and Gu (2017) where the PuSC was found to be positively related to the purchase intention of luxury clothing brands. The reason behind such a relationship of PuSC with intentional as well as consumption-related variables is quite obvious. The desire to look good and be perceived favorably by the people of the social circle motivates an individual to purchase from luxury clothing brands because these brands come with a promise of enhancing physical outlook along with symbolic meanings attached to the brand. However, it is also true that BC is triggered by PuSC which as a result contributes toward the formation of CC behavior but the results revealed that PuSC has its effect on CC even when BC is not present between two variables as a mediator. Additionally, the effect for

which BC is responsible for influencing CC is far greater than the effect caused by PuSC. Hence the biggest contributor to CC is BC which is also shown by the IPMA results. The IPMA results also indicated that where the biggest contributor of CC is BC, the most prominent effect on BC is through PV. This means the concerns and views to look physically attractive make the person brand conscious and due to this BC, an individual consumes conspicuously. Our results also confirm the assertions made by Mayasari et al. (2022) by presenting data-based evidence for the significant role of PV in the purchase behavior of customers in the (perceived) luxury fashion industry for original brands (Mayasari et al., 2022).

PV which is influenced by the BC, PrSC, and PuSC comparatively stronger in the initial chain of relationships too. This result is surprising because BC has always been strongly associated with variables like AV. The results of the study correspond to the results of all related previous studies in terms of the relationships that exist between PuSC (or social influence/pressure), BC (or brand prominence and/or perception), and Consumption practices e.g. purchase intention and/or purchase behavior, attitude toward the purchase, CC, etc. (Cheah et al., 2015; Giovannini, et al., 2015; Janpors, Raeisi Ziarani, & Taghavi, 2023; Ki & Kim, 2016; Mayasari et al., 2022; Nezlek et al., 2019; Sharda & Bhat, 2019; Siyao, 2021; Soh, Rezaei, & Gu, 2017; Xu, 2021; Zhang & Kim, 2013). The results shown by MGA for gender differences were surprising because males are more associated with AV and females are believed to rank higher on PV (Huang, Kumar, & Hu, 2018). Similarly, females were also found to be more brand conscious than males in previous related studies (Workman & Lee, 2013) but the results of the current study are contrary to this as MGA showed a relationship between vanity and BC was stronger when the males were taken into account as compared to females. This means, in the case of consumers from Punjab, Pakistan, males are more likely to be motivated to purchase from brands due to their physical appearance as well as achievement-related communication goals as compared to females. This coincides with the results of Workman, Lee, and Liang (2022) where males' obsession with their physical appearances was directly linked with social media usage. However, It should be noted that this study did not gender differences like the current study did to report higher physical vanity among males in Pakistan but logically interpret the current study's findings, the results may indicate significantly higher usage of social media among Pakistani male consumers as compared to females (Workman et al., 2022). On the other hand, females were found to be more publicly self-conscious based on their physical appearance. This indicates the fact that females view themselves more on the basis of people's opinions about their physical appearance. This also means that females are more likely to consume conspicuously to achieve their goals related to gaining positive opinions about their looks from the ones within their social circle and these opinions are even more important than what females think about themselves in terms of their appearances.

Implications

Theoretical

Different variables were identified that portray the phenomenon (or part of it) described by the respective theory. After highlighting those variables, they were integrated into the model with the help of existing pieces of evidence of the inter-relationships in the light of previous studies and theoretical knowledge. The study then tested the interactive relationships between the variables through which theories were tested, validated, and confirmed by the results of those tests. The variables that were highlighted at the beginning of the study and examined in the study did not have their causality defined and tested in any of the studies available in the literature (in terms of collective effects). The current research work adds to that knowledge (within the literature) by providing the nature and direction of the relationships between the variables for the first time. Where past studies highlighted the luxury or CC concerning vanity and SC only in terms of correlative relationships between the constructs (Lee & Workman, 2014; Workman & Lee, 2011, 2013) and/or identifying the causal relationships of the variables by taking limited variables into account (Balabanis & Stathopoulou, 2021; Giovannini et al., 2015; Khan et al., 2023; Kumagai & Nagasawa, 2023; Nagpaul & Pang, 2017; Sharda & Bhat, 2019; Siyao, 2021; Soh, Rezaei, & Gu, 2017; Xu, 2021; Waqar et al., 2023), the current work adds up to the body of literature by providing and validating a model in which a combined effect and causality of variables including vanity, self-

consciousness, and BC are assessed about conspicuous consumption. This not only advances the knowledge of consumer behavior in the industry but also provides a starting point for understanding how the variables can be influenced to reach desired marketing goals.

Practical

As far as the practical understanding and/or modification of a business model is concerned, the business tries to make perfect products to suit the personality of the customer so that the popularity of the brand among its customers can be maximized and so are the sales. As presented by the results of this research, when (fashion clothing) brand tries to design its marketing communications (e.g., advertising theme, campaign, or strategy) to make its products (garments and other fashion accessories related to garments) appealing to the target customers, the factors that are required to be taken into account include Vanity, Public Self-Consciousness and Brand Consciousness where Physical Vanity and Brand Consciousness are the most important ones. Designing communications that enhance these elements in the minds of the target customers about the products can result in maximum effectiveness leading to maximum sales as well as the brand's image. Not only these factors can boost sales but can also aid in capturing a distinct image in the minds of the customers which can result in repeat purchases. Young customers want to become more and more physically attractive by using fashion clothing products and the goal of communicating wealth through these brands is minimal (yet existent) as compared to the goals related to physical appearance. The marketing communications and efforts should be directed toward making the customers believe that the products make them look their best rather than trying to attach other meanings (which requires additional efforts that could not be of so much value and importance) to their products. This will aid (Physical) Vanity views and concerns of the customers that make them brand conscious; and which in result, brings the financial streams into the business.

The other perspective is sustainable consumption. Since conspicuous consumption does not refer to the idea of a well-balanced and productive economy, the study provides the factors that can be looked upon when the goal is to manage the consumption patterns in such a way that it could lead to sustainable consumption. Excessive orientation of individuals towards vanity aids in the development of excessive emphasis on self and brand consciousness due to which abnormal consumption patterns arise which heightens unproductive economic indicators. Hence, the actors responsible for managing and encouraging sustainable consumption can keep the narcissistic factors in check whenever the situation seems to move out of the picture of productive consumption leading to imbalanced economic elements.

Limitations and Future Directions

First of all, data from a limited geographic segment (Punjab, Pakistan) of customers was collected and analyzed in this research. Therefore, results may not be generalizable to customers from other countries. Hence, future studies can be conducted to test the relevance of the model in explaining the CC behavior of customers from different countries and cultures. Second, the study was limited to a specific group (university students) which is not reflective of the entire customer base of clothing brands. Future studies could be undertaken to study the effectiveness of the model to predict the CC behavior by taking into account the entire customer base of the clothing brands. Third, the research work presents the results that are illustrative of only one industry (fashion clothing brands) and may not be applicable to depict the consumption motivations of consumers from other industries e.g., automobile, and electronic industry. Considering this, future studies may be conducted for studying the CC's determinants in other industries where products are used by consumers conspicuously e.g., the smartphone industry. Additionally, the research assessed the categorical differences for only one group (gender) whereas differences that exist among other groups (e.g., based on income, occupation, etc.) are also worth the attention. Therefore, future studies can on studying differences among such groups toward CC. Finally, the tested psychological constructs predicted only 64.3% of the variance in CC. This indicates the room for other psychological constructs in the model that can be tested to increase the predictability of CC. Future studies could be undertaken to add and assess the effects of other psychological variables in the presented model.

References

- Ahmad, M., Jawad, K., Alvi, M. B., & Alvi, M. (2023). Google maps data analysis of clothing brands in south punjab, pakistan. *EAI Endorsed Transactions on Scalable Information Systems*, 10(3).
- Ahmed, M. A., Anwar-ul-Haq, M., Shafique, T., & Akram, B. (2023). Active mind, active learning: the role of materialism and psychological well-being for the determination of student's academic performance. *International Journal of Management in Education*, 17(1), 44-67.
- Ahuvia, A. C. (2005). Beyond the extended self: Loved objects and consumers' identity narratives. *Journal of Consumer Research*, 32(1), 171-184.
- Ali, F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., & Ryu, K. (2018). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International Journal of Contemporary Hospitality Management*, 30(1), 514-538.
- Amir, F., Zahur, S. F., Qureshi, A. N., Akbar, S. J., & Amin, M. F. (2014). Impulsive buying behaviour of women in apparel industry in Pakistan. *International Journal of Management Sciences*, 2(7), 296-314.
- Arnould, E. J., & Thompson, C. J. (2005). Consumer culture theory (CCT): Twenty years of research. *Journal of Consumer Research*, 31(4), 868-882.
- Awais, M. (2014). Self-control & Saving Habits. *Asian Journal of Engineering, Sciences & Technology (AJEST)*, 4(2).
- Balabanis, G., & Stathopoulou, A. (2021). The price of social status desire and public self-consciousness in luxury consumption. *Journal of Business Research*, 123, 463-475.
- Barrera, G. A., & Ponce, H. R. (2021). Personality traits influencing young adults' conspicuous consumption. *International Journal of Consumer Studies*, 45(3), 335-349.
- Batool, I., Awais, M., Rehman, K. U., Shafiq, M., & Dar, I. B. (2019). How Social Economy can add Value to State Development?. *Foundation University Journal of Business & Economics*, 4(1), 1-12.
- Becker, J. M., Rai, A., Ringle, C. M., & Völckner, F. (2013). Discovering unobserved heterogeneity in structural equation models to avert validity threats. *MIS quarterly*, 665-694.
- Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research*, 15(2), 139-168.
- Bhar, S., Lele, S., & Rao, N. D. (2022). Beyond income: correlates of conspicuous and luxury consumption in India. *Sustainability: Science, Practice and Policy*, 18(1), 142-157.
- Burnkrant, R. E., & Page Jr, T. J. (1982). On the Management of Self Images in Social Situations: The Role of Public Self Consciousness. *Advances in Consumer Research*, 9(1).
- Cavico, F. J., Muffler, S. C., & Mujtaba, B. G. (2012). Appearance discrimination in employment: Legal and ethical implications of "lookism" and "lookphobia". *Equality, Diversity and Inclusion: An International Journal*, 32(1), 83-119.
- Chang, W. L. (2019). Does beauty matter? Exploring the relationship between self-consciousness and physical attractiveness. *Kybernetes*, 48(3), 362-384.
- Chang, W. L., Liu, H. T., Lin, T. A., & Wen, Y. S. (2008). Influence of family communication structure and vanity trait on consumption behavior: a case study of adolescent students in Taiwan. *Adolescence*, 43(170).
- Chaudhuri, H., Mazumdar, S., & Ghoshal, A. (2011). Conspicuous consumption orientation: Conceptualisation, scale development and validation. *Journal of Consumer Behaviour*, 10(4), 216-224.
- Cheah, I., Phau, I., Chong, C., & Shimul, A. S. (2015). Antecedents and outcomes of brand prominence on willingness to buy luxury brands. *Journal of Fashion Marketing and Management*, 19(4), 402-415.
- Cohen, J. (2013). *Statistical Power Analysis for The Behavioral Sciences*. Routledge.
- Cummings, J. (1899). The theory of the leisure class. *Journal of Political Economy*, 7(4), 425-455.
- Dev, M., Podoshen, J. S., & Shahzad, M. (2018). An exploratory comparison of materialism and conspicuous consumption in Pakistan. *Journal of International Consumer Marketing*, 30(5), 317-

325.

- Dhaliwal, A., Singh, D. P., & Paul, J. (2020). The consumer behavior of luxury goods: A review and research agenda. *Journal of Strategic Marketing*, 1-27.
- Doherty, K., & Schlenker, B. R. (1991). Self-consciousness and strategic self-presentation. *Journal of Personality*, 59(1), 1-18.
- Durvasula, S., Lysonski, S., & Watson, J. (2001). Does vanity describe other cultures? A cross-cultural examination of the vanity scale. *Journal of Consumer Affairs*, 35(1), 180-199.
- Eagly, A. H., Ashmore, R. D., Makhijani, M. G., & Longo, L. C. (1991). What is beautiful is good, but...: A meta-analytic review of research on the physical attractiveness stereotype. *Psychological bulletin*, 110(1), 109.
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4(3), 272.
- Farrag, D. A. (2017). The young luxury consumer in Qatar. *Young Consumers*, 18(4), 393-407.
- Fenigstein, A. (1979). Self-consciousness, self-attention, and social interaction. *Journal of Personality and Social Psychology*, 37(1), 75.
- Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of consulting and clinical psychology*, 43(4), 522.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Gholami, R., Sulaiman, A. B., Ramayah, T., & Molla, A. (2013). Senior managers' perception on green information systems (IS) adoption and environmental performance: Results from a field survey. *Information & Management*, 50(7), 431-438.
- Giovannini, S., Xu, Y., & Thomas, J. (2015). Luxury fashion consumption and Generation Y consumers: Self, brand consciousness, and consumption motivations. *Journal of Fashion Marketing and Management*, 19(1), 22-40.
- Grubb, E. L., & Grathwohl, H. L. (1967). Consumer self-concept, symbolism and market behavior: A theoretical approach. *Journal of Marketing*, 31(4), 22-27.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-152.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of The Academy of Marketing Science*, 43, 115-135.
- Huang, J., Kumar, S., & Hu, C. (2018). Gender differences in motivations for identity reconstruction on social network sites. *International Journal of Human-Computer Interaction*, 34(7), 591-602.
- Hult, G. T. M., Ketchen, D. J., Griffith, D. A., Finnegan, C. A., Gonzalez-Padron, T., Harmancioglu, N., ... & Cavusgil, S. T. (2008). Data equivalence in cross-cultural international business research: assessment and guidelines. *Journal of International Business Studies*, 39, 1027-1044.
- Hung, K. P., Huiling Chen, A., Peng, N., Hackley, C., Amy Tiwsakul, R., & Chou, C. L. (2011). Antecedents of luxury brand purchase intention. *Journal of Product & Brand Management*, 20(6), 457-467.
- Husain, R., Ahmad, A., & Khan, B. M. (2022). The impact of brand equity, status consumption, and brand trust on purchase intention of luxury brands. *Cogent Business & Management*, 9(1), 2034234.
- Husain, R., Alam, A., & Khan, B. M. (2020). Impact of trait of vanity and social influence on luxury brands-a study on indian luxury consumers. *Elementary Education Online*, 19(4), 5375-5380.
- Husic, M., & Cicic, M. (2009). Luxury consumption factors. *Journal of Fashion Marketing and Management: An International Journal*, 13(2), 231-245.
- Iqbal, A., Nazir, H., & Memon, R. M. (2022). Shopping centers versus traditional open street bazaars: A comparative study of user's preference in the city of Karachi, Pakistan. *Frontiers in Built Environment*, 8, 1066093.

- Ismail, A. R. (2017). The influence of perceived social media marketing activities on brand loyalty: The mediation effect of brand and value consciousness. *Asia Pacific Journal of Marketing and Logistics*, 29(1), 129-144.
- Jabbar, A., Sheikh, A. A., & Raza, S. H. (2023). Examining the role of masstige value between celebrity endorsement and consumer engagement of fashion brands: An empirical study. *International Journal of Business and Economic Affairs*, 8(3), 103-111.
- Janpors, N., Raeisi Ziarani, M., & Taghavi, S. M. (2023). The Effect of Consumer Values, Brand Consciousness, and Behavioral Intentions on Luxury Fashion Apparel Consumption. In *5th International Conference on Brand Marketing, Challenges and Opportunities*.
- Johnson, C. M., Tariq, A., & Baker, T. L. (2018). From Gucci to green bags: Conspicuous consumption as a signal for pro-social behavior. *Journal of Marketing Theory and Practice*, 26(4), 339-356.
- Kapoor, D., & Munjal, A. (2019). Self-consciousness and emotions driving femvertising: A path analysis of women's attitude towards femvertising, forwarding intention and purchase intention. *Journal of Marketing Communications*, 25(2), 137-157.
- Ketron, S., & Naletelich, K. (2017). Redefining vanity sizing: when bigger may be better. *Journal of Fashion Marketing and Management: An International Journal*, 21(4), 438-452.
- Khan, S., Awais, M., Khan, M. N., & Khan, O. A. (2017). Moderating Effect of Employee's Emotional Intelligence on the Relation of Emotionally Intelligent Project Manager and Employee Engagement. *Foundation University Journal of Business & Economics*, 2(2), 41-67.
- Khan, R., Awais, M., & Malik, Q. A. (2023). Innovation, Sentiment, Great Market Crash and Stock Market Value Reflection: A case of Over-confidence and Attribution Bias of Stock's Investors. *Journal of Tourism, Hospitality, and Services Industries Research (JTHS)*, 3(02), 1-15.
- Khan, S., Fazili, A. I., & Bashir, I. (2023). I feel so embarrassed, still, I want it! The self-presentational dilemma of counterfeit luxury buyers. *Journal of Consumer Marketing*, 40(1), 87-101.
- Ki, C. W., & Kim, Y. K. (2016). Sustainable versus conspicuous luxury fashion purchase: Applying self-determination theory. *Family and Consumer Sciences Research Journal*, 44(3), 309-323.
- Ko, E., Costello, J. P., & Taylor, C. R. (2019). What is a luxury brand? A new definition and review of the literature. *Journal of Business Research*, 99, 405-413.
- Kumagai, K., & Nagasawa, S. Y. (2023). Effects of perceived luxury value and use of sustainable polyester on brand trust, perceived quality risk, and consumers' brand evaluation. *Journal of Global Fashion Marketing*, 14(2), 123-142.
- Kumar, A., Paul, J., & Unnithan, A. B. (2020). 'Masstige' marketing: A review, synthesis and research agenda. *Journal of Business Research*, 113, 384-398.
- Kupfer, J. (2021). The Vicious Undertow of Vanity in Young Adult. *Film and Philosophy*.
- Kurysheva, A., & Vernikov, A. (2024). Veblen was right: Why people seek unaffordable cars. *Journal of Economic Issues*, 58(1), 149-169.
- Kwon, Y. H. (1991). The influence of the perception of mood and self-consciousness on the selection of clothing. *Clothing and Textiles Research Journal*, 9(4), 41-46.
- Lachance, M. J., Beaudoin, P., & Robitaille, J. (2003). Adolescents' brand sensitivity in apparel: influence of three socialization agents. *International Journal of Consumer Studies*, 27(1), 47-57.
- Lee, S. H. (2010). Vanity, self-consciousness and brand consciousness. *Journal of Fashion Business*, 14(5), 93-101.
- Lee, S. H., & Workman, J. (2014). Vanity, fashion leadership, and self-consciousness among South Korean male and female college students. *International Journal of Fashion Design, Technology and Education*, 7(2), 115-124.
- Lewis, A., & Moital, M. (2016). Young professionals' conspicuous consumption of clothing. *Journal of Fashion Marketing and Management*, 20(2), 138-156.
- Liao, J., & Wang, L. (2009). Face as a mediator of the relationship between material value and brand consciousness. *Psychology & Marketing*, 26(11), 987-1001.
- Loureiro, S. M. C., Jiménez-Barreto, J., & Romero, J. (2020). Enhancing brand coolness through perceived luxury values: Insight from luxury fashion brands. *Journal of Retailing and Consumer*

Services, 57, 102211.

- Magklaras, V., Kapoulas, A., Xharavina, N., & Miaoulis Jr, G. (2023). Insights on metrosexuality and consumption for marketers in South-East Europe. *International Journal of Market Research*, 65(5), 622-641.
- Matthews, L. (2017). Applying multigroup analysis in PLS-SEM: A step-by-step process. *Partial least squares path modeling: Basic Concepts, Methodological Issues and Applications*, 219-243.
- Mayasari, I., Haryanto, H. C., Wiadi, I., Wijanarko, A. A., & Abdillah, W. (2022). Counterfeit purchase intention of fashion brands: The personal values and social aspect of consumers as determinants. *Gadjah Mada International Journal of Business*, 24(1), 1-24.
- Mehar, M. A. (2022). Magnitude of investment and global value chain: a case study of textile and clothing industry of Pakistan. *The Journal of The Textile Institute*, 113(2), 191-198.
- Miller, L. C., & Cox, C. L. (1982). For appearances' sake: Public self-consciousness and makeup use. *Personality and Social Psychology Bulletin*, 8(4), 748-751.
- Moon, M. A., Faheem, S., & Farooq, A. (2022). I, me, and my everything: Self conceptual traits and compulsive buying behavior. *Journal of Retailing and Consumer Services*, 68, 103075.
- Nagpaul, T., & Pang, J. S. (2017). Materialism lowers well-being: The mediating role of the need for autonomy—correlational and experimental evidence. *Asian Journal of Social Psychology*, 20(1), 11-21.
- Nawaz, N., Rehman, H., & Kashif, S. (2023). Stimulators of impulse buying behaviour: an analysis of Pakistan's readymade garment buyers. *International Journal of Electronic Marketing and Retailing*, 14(2), 202-224.
- Netemeyer, R. G., Burton, S., & Lichtenstein, D. R. (1995). Trait aspects of vanity: Measurement and relevance to consumer behavior. *Journal of Consumer Research*, 21(4), 612-626.
- Nezlek, J. B., Mochort, E., & Cypriańska, M. (2019). Self-presentational motives and public self-consciousness: Why do people dress a certain way?. *Journal of Personality*, 87(3), 648-660.
- Nia, A., & Lynne Zaichkowsky, J. (2000). Do counterfeits devalue the ownership of luxury brands?. *Journal of Product & Brand Management*, 9(7), 485-497.
- O'cass, A., & Frost, H. (2002). Status brands: examining the effects of non-product-related brand associations on status and conspicuous consumption. *Journal of Product & Brand Management*, 11(2), 67-88.
- Park, H. J., Rabolt, N. J., & Sook Jeon, K. (2008). Purchasing global luxury brands among young Korean consumers. *Journal of Fashion Marketing and Management: An International Journal*, 12(2), 244-259.
- Patsiaouras, G., & Fitchett, J. A. (2012). The evolution of conspicuous consumption. *Journal of Historical Research In Marketing*, 4(1), 154-176.
- Rizwan, S. I. (2023). Impact of Advertising Expenditure on the Sales of the Textile Industry (A Case Study of Leading Textile Companies in Pakistan). *Journal of Marketing and Management*, 14(1), 33-47.
- Ruganci, R. N. (1995). Private and public self-consciousness subscales of the Fenigstein, Scheier and Buss self-consciousness scale: A Turkish translation. *Personality and Individual Differences*, 18(2), 279-282.
- Saruchera, F., & Mthombeni, L. (2023). Antecedents to the conspicuous consumption of luxury fashion brands by middle-income black South Africans. *Journal of Fashion Marketing and Management: An International Journal*, 27(6), 944-964.
- Shahid, S., Islam, J. U., Farooqi, R., & Thomas, G. (2023). Affordable luxury consumption: An emerging market's perspective. *International Journal of Emerging Markets*, 18(2), 316-336.
- Sharda, N., & Bhat, A. (2019). Role of consumer vanity and the mediating effect of brand consciousness in luxury consumption. *Journal of Product & Brand Management*, 28(7), 800-811.
- Shim, S., & Gehrt, K. C. (1996). Hispanic and Native American adolescents: An exploratory study of their approach to shopping. *Journal of Retailing*, 72(3), 307-324.
- Sigurðardóttir, T. R. *The Effect of Family Communication Patterns and Social Support on Physical and*

Achievement Vanity (Doctoral dissertation).

- Siyao, L. (2021, June). Analysis of Luxury Brand and Consumer Psychology. In *2021 International Conference on Enterprise Management and Economic Development (ICEMED 2021)* (pp. 44-47). Atlantis Press.
- Soh, C. Q. Y., Rezaei, S., & Gu, M. L. (2017). A structural model of the antecedents and consequences of Generation Y luxury fashion goods purchase decisions. *Young Consumers*, 18(2), 180-204.
- Solomon, M. R., & Schopler, J. (1982). Self-consciousness and clothing. *Personality and Social Psychology Bulletin*, 8(3), 508-514.
- Spero, I., & Stone, M. (2004). Agents of change: how young consumers are changing the world of marketing. *Qualitative Market Research: An International Journal*, 7(2), 153-159.
- Sprotles, G. B., & Kendall, E. L. (1986). A methodology for profiling consumers' decision-making styles. *Journal of Consumer Affairs*, 20(2), 267-279.
- Tak, P. (2020). Antecedents of luxury brand consumption: An emerging market context. *Asian Journal of Business Research*, 10(2), 23-44.
- Teo, T. S., Srivastava, S. C., & Jiang, L. I. (2008). Trust and electronic government success: An empirical study. *Journal of Management Information Systems*, 25(3), 99-132.
- Tolbert, S. L., Kohli, C., & Suri, R. (2014). Who pays the price for loyalty? The role of self-consciousness. *Journal of Product & Brand Management*, 23(4/5), 362-371.
- Tsai, S. P. (2005). Impact of personal orientation on luxury-brand purchase value: An international investigation. *International Journal of Market Research*, 47(4), 427-452.
- ul Islam, M. S., Khaliq, A., Muien, H. M., & Shahwar, M. (2022). Consumers' Views and Responses Towards Sales Promotion Strategies in Pakistan: Fresh Evidence from Second Generational Approach. *International Journal of Management Research and Emerging Sciences*, 12(1).
- Usmani, S., & Ejaz, A. (2020). Consumer buying attitudes towards counterfeit and green products: application of social comparison theory and materialism. *South Asian Journal of Management*, 14(1), 82-103.
- Veblen, T. (2017). *The Theory of The Leisure Class*. Routledge.
- Vigneron, F., & Johnson, L. W. (2017). Measuring perceptions of brand luxury. *Advances in Luxury Brand Management*, 199-234.
- Wang, P. Z., & Waller, D. S. (2006). Measuring consumer vanity: A cross-cultural validation. *Psychology & Marketing*, 23(8), 665-687.
- Waqar, A., Javed, Z., & Rasool, A. (2023). Brand Consciousness, Social Comparison and Materialism amongst Teenagers. *Pakistan Journal of Humanities and Social Sciences*, 11(2), 1052-1060.
- Wong, W., & Malone, T. (2016). Contribution of vanity to consumer apparel advertising perception. *Journal of Fashion Marketing and Management*, 20(1), 54-71.
- Workman, J. E., & Lee, S. H. (2013). Relationships among consumer vanity, gender, brand sensitivity, brand consciousness and private self-consciousness. *International Journal of Consumer Studies*, 37(2), 206-213.
- Workman, J. E., & Lee, S. H. (2011). Vanity and public self-consciousness: a comparison of fashion consumer groups and gender. *International Journal of Consumer Studies*, 35(3), 307-315.
- Workman, J. E., Lee, S. H., & Liang, Y. (2023, January). Young Men's Social Media Use & Fashion Innovativeness: Body Consciousness, Vanity and Para-social Interaction. In *International Textile and Apparel Association Annual Conference Proceedings* (Vol. 79, No. 1). Iowa State University Digital Press.
- Xu, P., & Nuangjamnong, C. (2022). Understanding Chinese buying behavior in purchase intention towards luxury goods in China under the COVID-19 pandemic.
- Yi-Cheon Yim, M., L. Sauer, P., Williams, J., Lee, S. J., & Macrury, I. (2014). Drivers of attitudes toward luxury brands: A cross-national investigation into the roles of interpersonal influence and brand consciousness. *International Marketing Review*, 31(4), 363-389.
- Zhang, B., & Kim, J. H. (2013). Luxury fashion consumption in China: Factors affecting attitude and purchase intent. *Journal of Retailing and Consumer Services*, 20(1), 68-79.

The Impact of Corporate Sustainability Performance on the Financial Performance of Pakistani Manufacturing Firms: Evidence from GMM System

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Abstract

The purpose of this study is to investigate the impact of corporate sustainability performance (SP) on the financial performance (FP) of non-financial manufacturing firms in Pakistan. The relationship between SP and FP is still unclear and the manufacturing sector facing some issues about sustainability, that ultimately affect their performance. Quantitative data from eight years of 65 sample firms listed at the Pakistan Stock Exchange (PSX) is collected from annual reports. 2016 was selected due to the Sustainable Development Goals (SDGs) 2030 issued by the United Nations (UN) in 2015. SP is measured through the global reporting indicator (GRI). SP is measured through the content analysis and index created. FP is measured through return on assets (ROA) and return on equity (ROE). Firm size (FS) and total debt to total assets (TDTA) are used as control variables. For analysis generalized moment method (GMM) system is employed. Findings show that SP has a positive significant effect on FP. The resource-based view (RBV) theory supports these findings. According to researchers' knowledge, this is the pioneer study conducted on Pakistani manufacturing firms and employed the GMM model. The findings contribute significantly to the policy implications for the creation of sustainability to improve their FP.

Keywords: Sustainability Performance, Firm Performance, Manufacturing Firms, GMM, Pakistan

Introduction

Does Pakistani manufacturing FP benefit from SP? Numerous research over the past few decades have attempted to answer this question, but the outcomes are inconsistent (Hussain et al., 2018). Manufacturing firms are highly significant to the world's economy because these are almost 90% of all enterprises globally and 60% labor force is engaged in these firms (Khan et al., 2023). In the context of Pakistan (developing country), manufacturing firms constitute a significant economic force, with over five million individuals, about forty percent of the GDP, approximately seventy percent of the workforce employed, and all exports of the country coming from this sector. Pakistan's manufacturing firms do not fully contribute to the country's SDGs, despite their considerable economic contributions (Li et al., 2022).

Manufacturing firms commonly use natural resources without taking into account the effects on the environment on a global scale (Rehman et al., 2022). Seventy percent of global pollution is attributed to

manufacturing firms (Awewomom et al., 2024; Purwandani & Michaud, 2021). Remarkably, ninety-nine percent of these manufacturing firms in developing nations, neglect to include environmental management techniques in their business operations (Dey et al., 2022). Serious consequences from these manufacturing firm's omission of sustainability measures, including their contribution to global warming and the production of natural disasters such as heat waves, tsunamis, cyclones, scarcities, and floods (Fang, 2024). Environmental issues are a significant financial burden for businesses operating in developing nations, resulting in significant economic losses (Sakai & Yao, 2022). To protect their communities and the environment, businesses must implement sustainable practices and actively participate in social responsibility (Zhao & He, 2022).

Teamwork and a collective understanding are essential to fighting climate change, and organizations are essential in assisting the implementation of solutions (Khan et al., 2022). As a strategic approach to support sustainable business practices that give social and environmental concerns top priority and minimize adverse impacts, the concept of SP has been put out (Le, 2022). Finding a sound balance between the pursuit of profit, environmental care, and social responsibility is the aim of sustainability (Saghir & Awais, 2024; Sang & Han, 2023). Elkington (1997), asserts that sustainability encompasses social, environmental, and economic dimensions. Manufacturing associations that strenuously work for sustainable practices that can promote fiscal substance, in extension to gathering stakeholder prospects, are getting increasingly important (Schaltegger & Burritt, 2018). Wagner et al. (2019), assert that sustainability programs can lower charges, improve a business's brand, draw in more socially conscious companies, help cooperation form, and make finance agreements easier. However, also they must look into the relationship between SP and FP If manufacturing enterprises in Pakistan are to fully benefit from sustainability. The previous exploration that assessed SP's impact on FP has inconsistent effects (Hussain et al., 2018). As a result, exploration is needed, with an emphasis on Pakistani manufacturing enterprises, as they deal with further cases about the SP and FP.

The study's theoretical foundation is the RBV. According to the RBV, a company's distinct puissance and resources determine its FP (Barney, 1991). SP can be viewed as a resource that could support FP by strengthening a manufacturing establishment's resource base through tactics like sustainable force chain operation and invention in green technology (Awais, Saghir, & Nasir, 2023; Barney & Hesterly, 2006). A company's capacity to reallocate and reorganize its resources in response to relocating foreign reserves (Teece et al., 1997). This notion is exercised in this study to probe how sustainable practices improve FP in the context of Pakistani manufacturing companies.

It's insolvable to overestimate the significance of this study for Pakistan, where manufacturing enterprises which make up a huge portion of the business community are the backbone of the nation's economy (Awais, Sulehri, Dar, Mohsin, & Estes, 2021; Gerged et al., 2024). These artificial companies do, still, face a variety of expostulations, involving scarce resources, high competition, and environmental conditions. Pakistan also faces socioeconomic expostulations like compensation and profit inequality, as well as environmental cases comparable to contaminant and water disasters. Sustainable business practices are pivotal (Kohtamki et al., 2024; Yaqub, Awais, Aslam, Mohsin, & Rehman, 2022). By analyzing how SP influences the FP of manufacturing enterprises, this study offers a roadmap for Pakistani manufacturing firms to thrive economically and contribute positively to the environment and society at large. To help Pakistan strengthen its economic resilience and achieve sustainable growth while addressing pressing environmental and social issues, this research provides policymakers, business executives, and other stakeholders with useful insights.

The significance of these concepts cannot be disputed, yet it is still unclear how they relate to one another. More specifically, it is essential to look into how SP and FP relate to one another. This study was driven by the idea that modern organizations experience unprecedented amounts of uncertainty and upheaval. Understanding the components that allow manufacturing companies to adapt and respond to changing conditions is therefore essential. The RBV is one of the key theories that form the basis of this work. It builds a research model intending to establish whether or not SP efforts influence how manufacturing firms allocate their resources. Furthermore, this study emphasizes how crucial it is to fund SP projects to

improve organizational resilience and FP. This study also used secondary data and employed the GMM model to check the relationship between these variables.

Our study aims to shed light on these factors' significant influence and the consequences they have for companies operating in Pakistan. The empirical findings demonstrate a significant and positive link between these key variables. The data were collected from 65 manufacturing firms listed at PSX from 2016 to 2023. SP is measured through GRI indicators while FP is measured through ROA and ROE. STATA is used for statistical analysis. Additionally, by firmly establishing these results within the RBV, this study unites theory and practice and provides a thorough grasp of how sustainable practices, when properly used, lead to improved FP. This study has some contributions. Firstly, this study contributes to the literature to investigate the impact of SP on FP in the manufacturing sectors of Pakistan. Secondly, this study used the GMM model which is ignored by previous studies. Thirdly, SP is measured by GRI indicators which are introduced by the UNs. The study has implications for academia as well as for business executives and policymakers' useful information for promoting competitive excellence and sustainable growth in the unique environment of firms.

The remaining sections of the document are arranged as follows: The theoretical underpinning, creation of hypotheses, and conceptual framework are covered in section 2. The methodology is explained in Section 3. The results and discussion are presented in Section Four. While last section, section 5 consists of the conclusion.

Literature Review

Theoretical Background

The fundamental foundations of RBV guide our investigation of the complex interrelationship between SP and FP. The RBV, first introduced by Barney (1991), asserts that a company's potential to gain a competitive edge depends on its capacity to recognize, obtain, and efficiently utilize important and distinctive resources and skills. By fostering precious intangible assets like brand reputation and innovative capabilities, sustainable practices can be seen as strategic resources that improve competitive posture. It implies that firms that are skilled at adapting their sustainability programs quickly are better able to take advantage of new opportunities and control risks, which in turn improves their FP. Prior research has demonstrated that RBV can be used to understand the relationships among financial outcomes, sustainability practices, and competitive advantages. Examples of these studies are Barney (1991) and Teece et al. (1997). These generalities give a strong theoretical frame for our exploration, especially when taking into account Pakistani manufacturing companies.

Hypotheses Development

Sustainability Performance

Elkington was the first to introduce the eidolon of sustainability in 1997. It offers a complete program for scoring marketable success by involving social, environmental, and profitable objects. Sustainability is the thing of adding profitable value generation while also enhancing and securing the environment and society. According to Masud et al. (2019), sustainability is the process of generating value for the association and society. Sustainability practices are the thoughtful operation of policymakers of manufacturing firms that achieve a maintainable balance between furthering social enhancement, environmental conservation, and profitable expansion (Kamble et al., 2020). Helleno et al. (2017) claim that SP is a collection of thoughtful acts intended to satisfy current demands without exposing those of unborn conceptions the industry that uses SP adapts the policies to regard the social, environmental, and profitable goods (Moktadir et al., 2018).

The Brandt and Commission define sustainable evolution as the pursuit of objects that "meet the requirements of the present without exposing unborn conceptions' capability to meet their requirements". This description is harmonious with sustainability. In strategic environments, the journey's corporate social responsibility (CSR) and sustainability may be exercised interchangeably; still, it's important to flashback that CSR has not become as significant as sustainability over time (Beachfront et al., 2015). The

objectification of sustainability into business missions and structures is a sophisticated procurator. Elkington (2018) highlights how social sustainability has been promoted for profitable sustainability with social and environmental considerations, instanced by miscellanies like the 'Triple Bottom Line' or 'TBL'.

Sustainability Performance and Firm Performance

The relationship between SP and FP has been the reason for the difference in the opinion of researchers. SP has no effects on FP (Revelli & Viviani 2015; Rowley & Berman 2000; Van Beurden & Gössling, 2008). Friede et al. (2015) and Rahi et al. (2024) discovered that old firms have a positive significant effect of SP on FP. According to Albuquerque et al. (2012); Zhou et al. (2024), SP is generally recognized as a strategic standard that could boost a company's profitability. According to Albuquerque et al. (2019); Lourenço et al. (2012), adopting sustainable practices is anticipated to give companies a competitive bite within their region, leading to swelled products and lower exposure to systemic threats.

Earlier studies between SP and FP claim that SP didn't always positive effect on FP. According to some research, there is a correlation between environmental practices and FP, which emphasizes the importance of attending to environmental stakeholders' concerns (Friede et al., 2015; Salama, 2005). As shown by Arvidsson (2022); Fauzi et al. (2007), and Gutiérrez-Ponce and Wibowo (2024) neglecting these stakeholders might result in disagreements, higher costs, and reduced FP. Another study suggests that increasing SP could lead to higher expenses and a decrease in marginal net benefits (Horvathova, 2010). Moreover, given the acknowledged variations across countries and legal systems, the conclusions drawn from these connections may vary based on the particular environment.

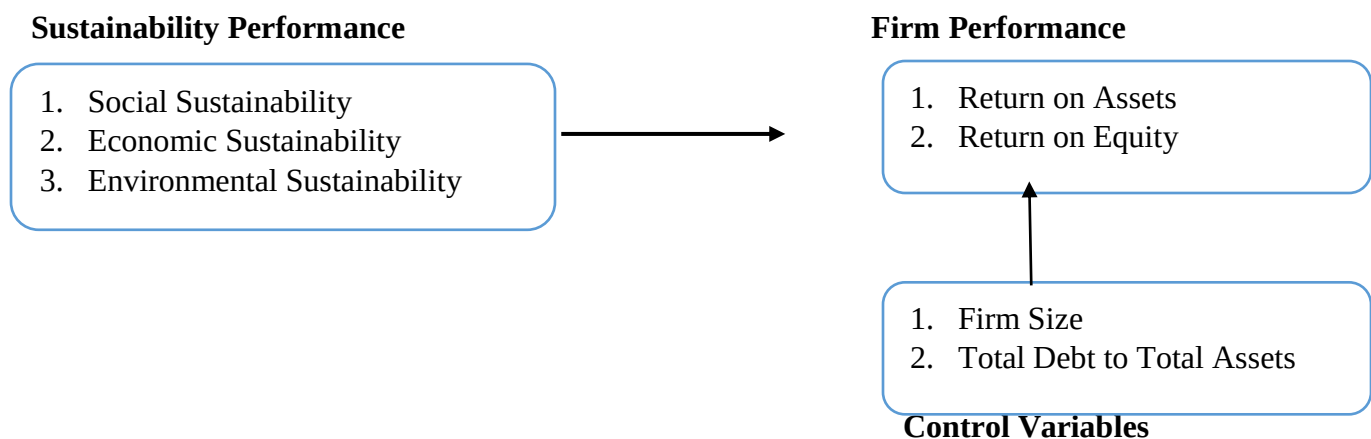
Academics emphasize the importance of examining diverse organizational settings (Theyel, 2000). While some studies demonstrate that SP positively affects FP and gives the company a long-term competitive advantage. Research has also shown that investing with social responsibility leads to better financial outcomes. However, other studies show contradictory findings, such as the notion that business spending on sustainability initiatives wastes money that could be allocated to other lucrative ventures (Peng & Yang, 2014). Weston and Nnadi (2023) have not discovered any connection between SP and FP. To sum up, previous studies on the association between SP and FP have shown contradictory results when looking at specific SP components as well as looking at SP holistically (Friede et al., 2015; Rowley & Berman, 2000). We propose the following hypotheses based on above literature review:

Hypothesis 1: Sustainability Performance has effects on Firm Performance (return on assets).

Hypothesis 2: Sustainability Performance has effects on Firm Performance (return on equity).

Conceptual Fretwork

The conceptual framework of this study is given below in in figure which is created based on literature.



Methodology

Data

The sample for this study consists of 65 manufacturing firms that were listed between 2016 and 2023 on the PSX. The sample was selected based on a set of criteria, which included being a publicly traded non-financial firm, providing facts about sustainability, and remaining listed for the period of the research. The selected study period agrees with the UN's 2015 release of the SDGs mandate for public firms.

Model Specification

The association between SP and ROA has been measured through the following model:

$$ROA_{it} = \beta_0 + \beta_1 ROA_{it-1} + \beta_2 SP_{it} + \beta_3 SP_{Ecoit} + \beta_4 SP_{Envit} + \beta_5 SP_{Socit} + \beta_6 FS_{it} + \beta_7 TDTA_{it} + \epsilon_{it} \dots (1)$$

The association between SP and ROE has been measured through the following model:

$$ROE_{it} = \beta_0 + \beta_1 ROE_{it-1} + \beta_2 SP_{it} + \beta_3 SP_{Ecoit} + \beta_4 SP_{Envit} + \beta_5 SP_{Socit} + \beta_6 FS_{it} + \beta_7 TDTA_{it} + \epsilon_{it} \dots (2)$$

Where;

ROA_{it} = Return on Assets of firm i at time t

ROE_{it} = Return on Equity of firm i at time t

SP_{it} = Sustainability Performance of firm i at time t

SP_{Ecoit} = Economic Sustainability Performance of firm i at time t

SP_{Envit} = Environmental Sustainability Performance of firm i at time t

SP_{Socit} = Social Sustainability Performance of firm i at time t

FS_{it} = Size of firm i at time t

$TDTA_{it}$ = Total Debt to Total Assets of firm i at time t

ϵ_{it} = error term

Measurement of Variables

The measurement of variables is given below in detail.

Measurement of Dependent Variable

Earlier studies by Ali et al. (2022); Farooq and Ahmad, (2023); and Naeem et al. (2024) used ROA, ROE, earning per share and Tobin's q to measure FP. So, this study used proxies ROA and ROE to measure FP. Net income divided by total assets yields ROA, while net income divided by total equity yields ROE.

Measurement of Independent Variable

The Independent variable used in this study is SP. SP is measured through content analysis of annual reports rather than the data collection through questionnaires. Questionnaire data depends on respondent behavior and mood. So, SP is measured through GRI 39 dimensions (8 for economic, 17 for environmental, and 14 for social) in dummy form. If the indicator is mentioned then assign otherwise 0 after this, we created the index of these indicators by using this formula:

Index = No of items disclosed / Total item on an indicator.

This methodology is aligned with Alam and Tariq (2023) and Zhou et al. (2024).

Measurement of Control Variable

Some control variables (FS, and TDTA) have been added to the regression model to increase its quality. These variables are added because they affect FP (i.e. when any firm has more resources it can work on its performance and another side when firms more rely on debt ultimately their performance is affected). FS is calculated as the natural logarithm of total assets. According to this viewpoint, businesses with higher log or assets are anticipated to produce higher performance than lower assets firms. Finally, TDTA is calculated by dividing the total debt by the total assets of the firm. Ali et al. (2022); Farooq and Ahmad (2023), and Naeem et al. (2024) used these variables in their studies.

The data analysis, which includes descriptive analysis, correlation, and regression is presented in the section that follows as a conclusion to the findings.

Results

The GMM model is used to analyze the relationship between the variables. The GMM model is better than the OLS regression model as well as a fixed effect and random effect model.

Descriptive Results

Table 1 Descriptive Result

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	520	0.54	0.39	-0.36	0.79
ROE	520	0.62	0.19	-.019	0.82
SP	520	0.59	0.11	0.49	0.74
SP _{Eco}	520	0.42	0.13	0.26	0.51
SP _{Env}	520	0.61	0.10	0.15	0.76
SP _{Soc}	520	0.70	0.23	0.51	0.97
FS	520	5.32	0.49	4.32	7.49
TDTA	520	0.51	0.19	0.15	0.78

Notes: This table shows the descriptive statistics. In this result ROA shows return on assets, ROE is the abbreviation of return on equity. SP is sustainability performance, SP_{Eco} is sustainability economic performance, SP_{Env} is sustainability environmental performance and SP_{Soc} is sustainability social performance. While FS represents the firm size and TDTA to total debt to total assets.

Table I summarizes the descriptive result of variables which contained mean, standard deviation, minimum, and maximum value. The mean values of ROA and ROE are 0.54 and 0.62 respectively. It shows that most firms utilize their resources properly and work on SP to improve FP. The mean value of SP is 0.59 percent. This suggests that the majority of the firms realize the importance of SP and working on it. The average value of SP in this study is bigger than those reported by certain writers in other developing countries (Mehboob et al., 2023), as they reported. The mean values of economic sustainability, environmental sustainability, and social sustainability are 0.42, 0.61, and 0.70 respectively. FS and TDTA mean values are 5.32 and .51 respectively.

Correlation and Variance Inflation Factor Result

Table II Correlation Result

Variables	SP	SP _{Eco}	SP _{Env}	SP _{Soc}	FS	TDTA
SP	1.000					
SP _{Eco}	0.07	1.000				
SP _{Env}	0.21	0.39	1.000			
SP _{Soc}	0.07	0.42	0.57	1.000		
FS	0.03	0.06	0.14	-0.02	1.000	
TDTA	-0.29	-.020	-0.19	-0.39	0.26	1.000

Table III Variance inflation factor

Variables	VIF	1/VIF
SP _{Eco}	1.49	0.67
FS	1.31	0.76
SP _{Env}	1.21	0.82
SP	1.18	0.84
SP _{Soc}	1.12	0.89
TDTA	1.06	0.94
Mean VIF	1.23	

Notes: This table shows the correlation and VIF statistics. In this result ROA shows return on assets, ROE is the abbreviation of return on equity. SP is sustainability performance, SP_{Eco} is sustainability economic performance, SP_{Env} is sustainability environmental performance and SP_{Soc} is sustainability social

performance. While FS represents the firm size and TDTA to total debt to total assets.

The correlation analysis of the study's variables is shown in Table II and VIF in Table III. The correlation result shows that the highest value is 0.57 among environmental sustainability and social sustainability. However, this value is less than the threshold of 0.70 (Farooq et al., 2023). VIF mean is also 1.23 which is lower than the threshold. This result indicates that no multicollinearity issue exists among variables.

Regression Result

Table IV Regression Result

Variables	ROA	ROE
Lagged of Dependent	0.382*** -0.016	0.274*** -0.015
SP	0.550*** -0.034	0.521*** -0.035
SP _{Eco}	0.386*** -0.016	0.372*** -0.045
SP _{Env}	0.276*** -0.015	0.413*** -0.055
SP _{Soc}	0.270*** -0.015	0.086*** -0.010
FS	0.050 -0.034	0.141*** -0.042
TDTA	-0.260*** -0.021	-0.086*** -0.026
Constant	0.909*** -0.216	0.861*** -0.262
Year dummy	Yes	Yes
Industry dummy	Yes	Yes
Observations	520	520
Wald Chi2	668.24	462.11
Hansen's test	0.41	0.85
AR(1)	0.017	0.002
AR(2)	0.62	0.71
No. of companies	65	65

Notes: This table shows the GMM result. In this result ROA shows return on assets, ROE is the abbreviation of return on equity. SP is sustainability performance, SP_{Eco} is sustainability economic performance, SP_{Env} is sustainability environmental performance and SP_{Soc} is sustainability social performance. While FS represents the firm size and TDTA to total debt to total assets.

The figures in parentheses are the standard errors.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table IV shows the regression result of the variables. The result found a positive significant effect of SP and their dimensions on ROA and ROE. RBV supports these findings. It claims that those firms who use their resources, work for environmental protection and social enhances the image of firms. These things ultimately improve the performance of firms. All variables have a positive effect while TDTA negatively affects ROA and ROE. It indicates that when firms use more debt in their capital structure these things negatively affect their performance.

Results indicate that SP brings a 62% change in ROA and a 71% change in ROA. This result underlines the importance of seeing the interests of various stakeholders, including employees, customers, and society at great as well as economic and environmental factors. Therefore, SP and its dimensions play a role in shaping organizational dynamics, broader societal norms, and stakeholder pressures and also contribute significantly to advancing SDGs 2030. So all the hypotheses are accepted.

Conclusion

The purpose of this research was to examine how SP affects FP. Our results provide a new context and a deeper understanding of the differences found in previous studies (Trumpp et al., 2015). As shown in Table IV, our results confirm previous findings (Nollet et al., 2016) and show that SP dimensions have a favorable effect on FP. Our study closes this gap by providing empirical data. We offer a new set of measures intended to more accurately reflect the sustainability efforts of enterprises in all SP dimensions. These data, according to our models, will support our theory. While other studies that evaluate SP in terms of transparency have shown contradictory results, the SP characteristics do have a significant impact on FP when examined in terms of performance (Hussain et al., 2018). Notably, our research demonstrates that the inclusion of our variables greatly increases the models' overall explanatory power, and the coefficients differ significantly based on the particular sustainability aspect under investigation. We call for further development of the SP framework in light of these facts. We draw the conclusion that the methodology used to measure SP is crucial and can provide more definitive information on the nature of the connection between FP and sustainability engagement. Our findings further highlight the necessity of reassessing and realigning the SP dimensions.

Our findings demonstrate that a concentration on sustainable development goals is the only way to fully realize the impact of a major commitment to sustainability goals, irrespective of the degree of transparency. The RBV's concepts are supported by these results. Moreover, our data support the Porter hypothesis by showing that real dedication to SP has positive outcomes. These results are consistent with those of Alam and Tariq (2023); Gómez-Bezares et al. (2017); Pätäri et al. (2012); and Zhou et al. (2024) who found that to achieve a range of performance targets, organizations should incorporate sustainability into their strategic planning and raise their investments in social and environmental performance. Furthermore, we conclude that businesses that prioritize sustainability, particularly well-known ones outperform their competitors.

Our research has significant policy implications for all stakeholders (managers, owners, directors, and shareholders). Through SP they increase the FP of firms and also get more market shares. The firm's managers and directors by following these implications protect the environment and become responsible firms to adopt these guidelines. Moreover, given our discoveries on the connections among different SP dimensions and sub-dimensions, we suggest conducting additional research both globally and in developing or rising economies. We think that managers and policymakers can get important insights from a more thorough analysis of SP sub-dimensions.

References

- Alam, Z., & Tariq, Y. B. (2023). Corporate Sustainability Performance Evaluation and Firm Financial Performance: Evidence from Pakistan. *SAGE Open*, 13(3), 21582440231184856.
- Albuquerque, R., Durnev, A., & Koskinen, Y. (2012). Corporate social responsibility and asset pricing in industry equilibrium. *Available at SSRN*, 1961971.
- Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. *Management Science*, 65(10), 4451-4469.
- Ali, S., Murtaza, G., Hedvicakova, M., Jiang, J., & Naeem, M. (2022). Intellectual capital and financial performance: A comparative study. *Frontiers in Psychology*, 13, 967820.
- Arvidsson, S., & Dumay, J. (2022). Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice?. *Business Strategy and the Environment*, 31(3), 1091-1110.
- Awais, M., Saghir, R., & Nasir, M. I. (2023). Prominent Antecedents of Herding and Their Role in Financial Market Abnormalities. *Journal of Global Business & Technology*, 19(2).
- Awais, M., Sulehri, N. A., Dar, I. B., Mohsin, M., & Estes, J. (2021). Antecedents Of Optimism Bias of Investors in The Stock Market of Pakistan Along with The Scale Development of Optimism Bias. *Academy of Strategic Management Journal*, 20(3), 1-35.
- Awewomom, J., Dzeble, F., Takyi, Y. D., Ashie, W. B., Ettey, E. N. Y. O., Afua, P. E., ... & Akoto, O. (2024). Addressing global environmental pollution using environmental control techniques: a focus on environmental policy and preventive environmental management. *Discover Environment*, 2(1), 8.

- Barney, J. (1991). Competitive advantage. *Journal of Management*, 17(1), 99-120.
- Barney, J. B., & Hesterly, W. (2006). Organizational economics: Understanding the relationship between organizations and economic analysis. *The SAGE Handbook of Organization Studies*, 111-148.
- Broadstock, D. C., Matousek, R., Meyer, M., & Tzeremes, N. G. (2020). Does corporate social responsibility impact firms' innovation capacity? The indirect link between environmental & social governance implementation and innovation performance. *Journal of Business Research*, 119, 99-110.
- Busch, T., Cho, C. H., Hoepner, A. G., Michelon, G., & Rogelj, J. (2023). Corporate Greenhouse Gas Emissions' Data and the Urgent Need for a Science-Led Just Transition: Introduction to a Thematic Symposium. *Journal of Business Ethics*, 182(4), 897-901.
- Dey, P. K., Malesios, C., De, D., Budhwar, P., Chowdhury, S., & Cheffi, W. (2022). Circular economy to enhance sustainability of small and medium sized enterprises. In *Supply Chain Sustainability in Small and Medium Sized Enterprises* (pp. 10-45). Routledge.
- Eliwa, Y., Aboud, A., & Saleh, A. (2021). ESG practices and the cost of debt: Evidence from EU countries. *Critical Perspectives on Accounting*, 79, 102097.
- Elkington, J. (1997). Cannibals with forks: The triple bottom line of 21st century business, Capstone.
- Elkington, J. (2018). 25 years ago, I coined the phrase “triple bottom line.” Here’s why it’s time to rethink it. *Harvard Business Review*, 25, 2-5.
- Fang, X. (2024). Can climate risk exposure compel companies to undergo a green transformation?. *Journal of Cleaner Production*, 434, 140310.
- Farooq, M., & Ahmad, N. (2023). Nexus between board characteristics, firm performance and intellectual capital: an emerging market evidence. *Corporate Governance: The International Journal of Business in Society*, 23(6), 1269-1297.
- Farooq, M., Noor, A., & Naeem, M. (2023). Does family ownership moderate the relationship between board characteristics and corporate social responsibility? Evidence from an emerging market. *Asian Journal of Business Ethics*, 12(1), 71-99.
- Fauzi, H., Mahoney, L. S., & Abdul Rahman, A. (2007). The link between corporate social performance and financial performance: evidence from Indonesian companies. *Issues in Social and Environmental Accounting*, 1(1), 149-159.
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210-233.
- Gerged, A. M., Zahoor, N., & Cowton, C. J. (2024). Understanding the relationship between environmental management accounting and firm performance: The role of environmental innovation and stakeholder integration—Evidence from a developing country. *Management Accounting Research*, 62, 100865.
- Gómez-Bezares, F., Przychodzen, W., & Przychodzen, J. (2017). Bridging the gap: How sustainable development can help companies create shareholder value and improve financial performance. *Business Ethics: A European Review*, 26(1), 1-17.
- Gutiérrez-Ponce, H., & Wibowo, S. A. (2024). Do sustainability practices contribute to the financial performance of banks? An analysis of banks in Southeast Asia. *Corporate Social Responsibility and Environmental Management*, 31(2), 1418-1432.
- Helleno, A. L., de Moraes, A. J. I., & Simon, A. T. (2017). Integrating sustainability indicators and Lean Manufacturing to assess manufacturing processes: Application case studies in Brazilian industry. *Journal of Cleaner Production*, 153, 405-416.
- Horváthová, E. (2010). Does environmental performance affect financial performance? A meta-analysis. *Ecological Economics*, 70(1), 52-59.
- Hussain, N., Rigoni, U., & Cavezzali, E. (2018). Does it pay to be sustainable? Looking inside the black box of the relationship between sustainability performance and financial performance. *Corporate Social Responsibility and Environmental Management*, 25(6), 1198-1211.
- Initiative, G. R. (2011). Sustainability Reporting Guidelines (GRI–G3. 1) 2000-2011.

- Kamble, S., Gunasekaran, A., & Dhone, N. C. (2020). Industry 4.0 and lean manufacturing practices for sustainable organisational performance in Indian manufacturing companies. *International Journal of Production Research*, 58(5), 1319-1337.
- Khan, R. U., Arif, H., Sahar, N. E., Ali, A., & Abbasi, M. A. (2022). The role of financial resources in SMEs' financial and environmental performance; the mediating role of green innovation. *Green Finance*, 4(1), 36-53.
- Khan, S. A. R., Yu, Z., & Farooq, K. (2023). Green capabilities, green purchasing, and triple bottom line performance: Leading toward environmental sustainability. *Business Strategy and The Environment*, 32(4), 2022-2034.
- Kohtamäki, M., Bhandari, K. R., Rabetino, R., & Ranta, M. (2024). Sustainable servitization in product manufacturing companies: The relationship between firm's sustainability emphasis and profitability and the moderating role of servitization. *Technovation*, 129, 102907.
- Le, T. T. (2023). Corporate social responsibility and SMEs' performance: mediating role of corporate image, corporate reputation and customer loyalty. *International Journal of Emerging Markets*, 18(10), 4565-4590.
- Li, W., Liu, Z., Xia, S., Yan, J., Xiong, Y., Sakka, G., & Li, R. Y. (2022). How can emerging-market SMEs domestically benefit from their performance in developed countries? Empirical evidence from China. *Journal of Business Research*, 142, 200-210.
- Masud, M. A. K., Rashid, M. H. U., Khan, T., Bae, S. M., & Kim, J. D. (2019). Organizational strategy and corporate social responsibility: The mediating effect of triple bottom line. *International Journal of Environmental Research and Public Health*, 16(22), 4559.
- Mehboob, A., & Zaidi, S. S. Z. (2023). Impact of Sustainability Performance on Financial Performance of Small and Medium enterprises (SMEs) in Pakistan. *GISRAS Journal of Management & Islamic Finance (GJMIF)*, 3(4).
- Moktadir, M. A., Ali, S. M., Rajesh, R., & Paul, S. K. (2018). Modeling the interrelationships among barriers to sustainable supply chain management in leather industry. *Journal of Cleaner Production*, 181, 631-651.
- Naeem, M., Siraj, M., Abdali, A. S., & Mehboob, A. (2024). The Impact of Investment in AI on Bank Performance: Empirical Evidence from Pakistan's Banking Sector. *KASBIT Business Journal*, 17(1).
- Nollet, J., Filis, G., & Mitrokostas, E. (2016). Corporate social responsibility and financial performance: A non-linear and disaggregated approach. *Economic Modelling*, 52, 400-407.
- Pätäri, S., Jantunen, A., Kyläheiko, K., & Sandström, J. (2012). Does sustainable development foster value creation? Empirical evidence from the global energy industry. *Corporate Social Responsibility and Environmental Management*, 19(6), 317-326.
- Peng, C. W., & Yang, M. L. (2014). The effect of corporate social performance on financial performance: The moderating effect of ownership concentration. *Journal of Business Ethics*, 123, 171-182.
- Purwandani, J. A., & Michaud, G. (2021). What are the drivers and barriers for green business practice adoption for SMEs? *Environment Systems and Decisions*, 41(4), 577-593.
- Rahi, A. F., Johansson, J., Blomkvist, M., & Hartwig, F. (2024). Corporate sustainability and financial performance: A hybrid literature review. *Corporate Social Responsibility and Environmental Management*, 31(2), 801-815.
- Rehman, S. U., Bresciani, S., Yahiaoui, D., & Giacosa, E. (2022). Environmental sustainability orientation and corporate social responsibility influence on environmental performance of small and medium enterprises: The mediating effect of green capability. *Corporate Social Responsibility and Environmental Management*, 29(6), 1954-1967.
- Revelli, C., & Viviani, J. L. (2015). Financial performance of socially responsible investing (SRI): what have we learned? A meta-analysis. *Business Ethics: A European Review*, 24(2), 158-185.
- Rowley, T., & Berman, S. (2000). A brand-new brand of corporate social performance. *Business & Society*, 39(4), 397-418.
- Saghir, R., & Awais, M. (2024). Investigating the Relationship between Trade Openness and Government Size for Selected South Asian Countries. *Journal of Social & Organizational Matters* 3(3), 131-140.

- Sakai, P., & Yao, Z. (2023). Financial losses and flood damages experienced by SMEs: Who are the biggest losers across sectors and sizes?. *International Journal of Disaster Risk Reduction*, 91, 103677.
- Salama, A. M. (2005). PLADEW: a tool for teachers' awareness of school building sustainability. *Global Built Environment Review*, 5(1), 45-56.
- Sang, Y., & Han, E. (2023). A win-win way for corporate and stakeholders to achieve sustainable development: Corporate social responsibility value co-creation scale development and validation. *Corporate Social Responsibility and Environmental Management*, 30(3), 1177-1190.
- Schaltegger, S., & Burritt, R. (2018). Business cases and corporate engagement with sustainability: Differentiating ethical motivations. *Journal of Business Ethics*, 147, 241-259.
- Strand, R., Freeman, R. E., & Hockerts, K. (2015). Corporate social responsibility and sustainability in Scandinavia: An overview. *Journal of Business Ethics*, 127, 1-15.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- Theyel, G. (2000). Management practices for environmental innovation and performance. *International Journal of Operations & Production Management*, 20(2), 249-266.
- Trumpp, C., Endrikat, J., Zopf, C., & Guenther, E. (2015). Definition, conceptualization, and measurement of corporate environmental performance: A critical examination of a multidimensional construct. *Journal of Business Ethics*, 126, 185-204.
- Van Beurden, P., & Gössling, T. (2008). The worth of values—a literature review on the relation between corporate social and financial performance. *Journal of Business Ethics*, 82, 407-424.
- Wagner, N., Strulak-Wójcikiewicz, R., & Landowska, A. (2019). Trust in sharing economy business models from the perspective of customers in Szczecin, Poland. *Sustainability*, 11(23), 6838.
- Weston, P., & Nnadi, M. (2023). Evaluation of strategic and financial variables of corporate sustainability and ESG policies on corporate finance performance. *Journal of Sustainable Finance & Investment*, 13(2), 1058-1074.
- Yaqub, A., Awais, M., Aslam, S., Mohsin, M., & Rehman, A. U. (2022). Determining the Association between Monetary Policy, Corporate Investments and Cash Holdings. *Academy of Accounting and Financial Studies Journal*, 26(1), 1-18
- Zhao, L., & He, Q. (2022). Explicating the micro-foundation of SME pro-environmental operations: the role of top managers. *International Journal of Operations & Production Management*, 42(4), 500-525.
- Zhou, D., Saeed, U. F., & Agyemang, A. O. (2024). Assessing the role of sustainability disclosure on firms' financial performance: Evidence from the energy sector of belt and road initiative countries. *Sustainability*, 16(2), 930.

How Can Green Finance and Technological Innovation Transform Sustainable Performance Across G20 Nations?

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Abstract

Achieving sustainable goals involves leveraging private sector investments in renewable energy sources. The global surge in demand for alternative renewable energy and green finance has spurred extensive research in these domains. Throughout the study period, the evaluation of sustainable practices is conducted through the environmental, social, and governance (ESG) pillars. This study investigates the impact of green finance, green energy, and green economic development with the moderation of technological innovation by utilizes secondary data spanning from 2011 to 2020 across G-20 countries. Using the fixed effects method, the results confirm significant relationships between sustainability, green finance, economic development, GDP, and technological innovation. Green finance, green energy, and green economy development negatively impact sustainability, while technological innovation shows a positive effect. However, the moderating role of technological innovation negatively influences sustainability when combined with green finance. The findings are robust and validated through Driscoll-Kraay (D-K) standard error estimation. Policymakers should prioritize reforms in green finance policies to ensure they effectively contribute to long-term sustainability goals. Moreover, fostering a stronger integration of technological innovation with green economic development can significantly enhance the outcomes of sustainability in the G-20 countries. Encouraging investments in both green energy and innovation, along with the regulatory frameworks that promote sustainable development, will be crucial to advancing environmental sustainability while achieving economic growth.

Keywords: Green finance; Green Energy; sustainable practices; technological innovation; ESG; Green Economy; G-20

Introduction

In recent decades, the issue of climate change has garnered significant attention from researchers, scholars, climate activists, and governmental authorities (Razzaq et al., 2021; Sun et al., 2021). The international community has raised concerns about some environmental changes, including but not limited to climate change, desertification, destruction of tropical rainforests, erosion of coastal ecosystems, depletion of soil resources, overfishing, an end to species, and biodiversity loss. The rapidly deteriorating global atmosphere has become a major issue that affects all of humanity, particularly when it comes to ensuring access to fresh water, food production, land use, environmental balance, and human welfare (Kartal et al., 2022; Li & Haneklaus, 2022; Shan et al., 2021).

A collection of seventeen interrelated Sustainable Development Goals (SDGs) that are closely linked to the Five P's—planet, people, prosperity, peace, and partnership—make up the 2030 Agenda for Sustainable Development, or Agenda 2030. Within this framework, 17 sustainable goals have been designed to collectively address urgent global concerns relating to social injustice, environmental degradation, and climate change (Khaled et al., 2021). The implementation of instruments targeted at achieving these goals requires national efforts to be coordinated by creating SDG roadmaps and progress

reports for each nation and encouraging international multi-stakeholder partnerships. No matter how developed or developing a country is categorized as, this requirement still applies (Plastun et al., 2022).

However, an evident concern in the context of these sustainable objectives is the seeming absence of sincere dedication and compliance by corporate organizations. In particular, research from (PwC, 2019) shows that around 72% of businesses prominently use the term "sustainable development goals" (SDGs) in their reports. On the other hand, just twenty percent have put quantitative measures in place to actively work towards these objectives. This strengthens the case that a sizable portion of companies and sectors still fail to implement strategies that result in noticeable advantages for a sustainable environment (Awais, Shah, Abidy, & Scholar, 2018; Zhuang et al., 2022).

A significant gap exists in the theoretical and empirical literature regarding how companies and related industries might evaluate their actions concerning the SDGs. Within this framework, corporate sustainability performance becomes a crucial indicator of how well an industry or company is contributing to these sustainable objectives (Arayssi & Jizi, 2019). However, the use of environmental, social, and governance (ESG) scores—a combination known as ESG—in the assessment of sustainable performance has gained support in the research. These results demonstrate a dedication to non-monetary objectives that correspond with efforts made towards sustainable development (Halbritter & Dorfleitner, 2015; Paolone et al., 2022). According to studies by Kocmanová and Šimberová (2014) and Kocmanová et al. (2011) and it is important to incorporate ESG indicators into the corporate strategy. Their results highlight the need for financial indicators to be supplemented because they alone are unable to provide a complete picture of overall performance.

The persistent rise in carbon dioxide (CO₂) emissions raises concerns, particularly for the nations heavily dependent on fossil fuels for their economic advancement. Economic advantages have been prioritized over environmental well-being in these countries, which are frequently categorized as emerging economies with insufficient technological progress. Their heavy reliance on imported and local fossil fuels to meet their energy needs has resulted in significant environmental damage (Udeagha & Ngepah, 2019, 2023). Reducing CO₂ emissions is widely acknowledged as being essential, with a focus on striking a balance between environmental conservation and economic growth. As a result, scholars are investigating many elements, such as green finance (GFN) and financial technology (fintech), in order to formulate approaches for cultivating a sustainable and environmentally conscious global environment (Udeagha & Ngepah, 2023).

Green financing and technological innovation enable industries to embrace and promote E.S.G. Green technological innovation is a reflection of states' determination to stop environmental degradation, especially through technological developments in the energy economy and the production of green energy. It makes the money flow from industries that produce large amounts of carbon dioxide and pollution to those that use cutting-edge technologies. According to Zhang and Wang (2021), the green finance contributes to the enhancement of ecological sustainability and management, acting as a remedy for environmental damage. The capacity of green finance to bring industrialized and developing nations together in the common fight against pollution is one of its main advantages. The green finance framework directs promising investments and financing for environmentally conscious projects (Muganyi et al., 2021).

In addition, researchers are intensively studying how clean and green energy can be used to curb environmental degradation and influence the direction of sustainable performance. Green and eco-friendly energy consumption shows negligible environmental impact and presents itself as a solution for attaining sustainable results. Simultaneously, clean and green energy sources are undergoing significant ongoing development (Li et al., 2019; Razzaq et al., 2021). However, using conventional or non-renewable energy sources is frequently thought to be cheaper and more cost-effective. But doing so comes at the cost of using more non-renewable energy, which could result in higher greenhouse gas emissions. Therefore, the literature emphasizes how important it is to use clean energy in order to achieve sustainable results,

stressing how important it is to not undervalue its function (Awais, Kashif, & Raza, 2020; Hillerbrand, 2018; Midilli et al., 2006; Razzaq et al., 2021).

The term "green economy" first appeared over two decades ago (Barbier, 2011). The green economy, which is positioned as a long-term approach to navigating economic crises, strives for poverty reduction, economic recovery, and the simultaneous reduction of carbon emissions and prevention of ecological destruction (Barbier, 2011). A "green economy" is one that promotes social justice and human well-being while minimizing negative ecological effects, according to the United Nations Environment Programme (UNEP, 2011). Thus, pursuing green growth which is consistent with the idea of a green economy contributes naturally to sustainable development (Kasztelan, 2017; Ohotina, 2016). However, continuous work is necessary to create global models and scenarios that evaluate national "green economy" and "green" growth strategies (Kasztelan, 2017).

This study investigates the impact of green financing and green economy development on sustainable practices through technological innovation in G20 countries over the 2012-2022 period. The inclusion of G-20 nations in this research is motivated by their significant influence in international negotiations and environmental protection accords, particularly due to the migration of industries from developed to G-20 economies. This industrial migration, driven by the stringent environmental regulations in established economies and lower production costs in developing nations, has resulted in an increased CO₂ emission, surpassing those of other growing economies (Udeagha & Ngepah, 2023). Previous literature has mentioned many other factors that affect sustainability such as energy efficiency (Rasoulinezhad & Taghizadeh-Hesary, 2022), economic growth (Ning et al., 2023), green financial development (He et al., 2019), corporate social responsibility (Awais, Khan, Hassan, & Ishaq, 2023; Guang-Wen & Siddik, 2022), and previous research was mainly focused on G7 countries (Yang et al., 2022) but the literature lacks a comprehensive analysis of how green financing, green economy development, and technological innovation interact specifically in the G-20 context.

Furthermore, Polzin and Sanders (2020); Zhang and Wang (2021) highlight the role of green finance in promoting sustainable renewable energy development by attracting private investors and fostering collaboration between state and private sectors. Insights from Sarangi (2018) emphasize the contribution of the growing green energy financing market to enhancing green projects in India, thereby increasing the overall share of green energy in the country's energy portfolio. The direct and positive influence of green finance on renewable energy development is contingent on financial market mechanisms and state policies related to green finance, as argued by Ahn et al. (2022), emphasizing the necessity of green economic reforms for boosting the investment in environmentally friendly energy production.

Lastly, the incorporation of a green technology innovation in this study adds a significant contribution to the literature, as it is recognized as an effective solution to the environmental pollution problems and a means to enhance ecological quality. Green technology innovation has the potential to substantially reduce the carbon emissions (Castellacci & Lie, 2017). Evaluating the green technology innovation of enterprises becomes a pivotal strategy in determining their ability to achieve green and sustainable development (Ghulam, Rizwan, & Awais, 2024; Huang & Li, 2017). Beyond mitigating ecological damage, the upgrading and transition of green technology within enterprises can confer a competitive advantage and establish long-term sustainable goodwill (Hernández-Chea et al., 2021).

Literature Review

Numerous studies have delved into the correlation between Green Finance (GF) and Sustainable Development (SD). According to (Wang & Zhi, 2016), GF is essential to the sensible balance between environmental and financial resources and the efficient management of environmental risks. Although there are differences in how green finance is conceptualized, (Liu et al., 2020), suggest that its core components are a dedication to environmental preservation and social responsibility. Green finance, positioned as a new catalyst, has become a major force behind the expansion of the green economy.

According to Ng (2018), green finance is an economic initiative that supports the preservation of the environment, maximizes the use of available resources, and tackles climate change. Green finance prioritizes sustainable development, the green sector, and ecological conservation over traditional finance (Falcone & Sica, 2019; Kang et al., 2019). Kandpal and Agarwal (2024) highlight that attaining environmental, social, and governance (ESG) objectives can be facilitated by allocating more funds for environmental planning in conjunction with finance mechanisms designed for projects that are climate-friendly. According to Zhang and Wang (2021), there is evidence that a strong growth in green financing may greatly reduce the use of coal and advance the development of sustainable energy sources. Green finance dramatically lowers carbon emissions over the long and short terms, according to Al Mamun et al. (2022). To optimize resource allocation and handle environmental externalities, Zhao et al. (2022) contend that China's green financial strategy needs to be better planned and designed. It is noteworthy, therefore, that green funding does not invariably result in a favorable influence on sustainable development. According to Sachs et al. (2019), different players in green financing have different beneficial relationships. Sinha et al. (2021) provide additional evidence that the green financing method may progressively harm social and environmental responsibility. Increased investor knowledge of environmental issues, according to Strand (2024) will result in a rise in green bond investments and cheaper borrowing for lenders. Green bonds are used for environmental initiatives and are thought to be a major instrument of innovation in green financing over the previous decade (Gabr & Elbannan, 2024). As green bonds are issued more frequently, Tolliver et al. (2019) show that more and more individuals are questioning whether they are a viable source of funding for ecological restoration. Green bonds, loans, and other financial instruments are presented by Niyazbekova et al. (2021) as efficient ways to allocate funding to projects that solve the climate crisis.

Numerous investigations have explored the relationship between environmentally sustainable practices and green financing. Fu and Irfan (2022) study, which examines the relationship between green finance and environmental sustainability in the economies of the Association of Southeast Asian Nations (ASEAN), serves as an example of one of these investigations. Khan et al. (2024) studied the systematic review on green finance and environmental sustainability. According to their research, green financing and environmental sustainability are positively correlated; nevertheless, there may be trade-offs with possibilities for economic growth in this relationship. Shahzad and Riaz (2022) are conducting another study to understand how green finance affects environmental sustainability in five regions. To evaluate green financing, the study uses five variables: GDP, investment in renewable energy sources, R&D for eco-friendly initiatives, output of renewable electricity, and public-private energy investment. Further, Ma and Huang (2023) studied the impact of green finance on sustainability. The results show that reducing CO₂ emissions is facilitated by increasing the output of renewable energy, improving research and development, and growing public-private partnerships that invest in renewable energy. Based on all these studies, it can be hypothesized that:

H1: Green Finance significantly influence the Sustainability.

A considerable body of the scholarly literature has explored the nexus between the green energy and sustainable development. In an early contribution, Midilli et al. (2006) delineated the key green energy strategies aimed at fostering sustainable development. These strategies encompassed metrics such as green energy impact ratio, the green energy-based sustainability ratio, and the green energy utilization. The authors noted a positive correlation between green energy-based sustainability ratio and the technological, sectoral, and implication impact ratios. Moreover, the recent policy initiatives within the BRICS nations advocates an intensified commitment to a renewable energy investment as a catalyst for the sustainable development. According to Li et al. (2021) implementing strategies including cutting back on coal usage, increasing the use of renewable energy, and streamlining energy structures are essential to attaining sustainable and environmentally friendly economic development. Thus, it can be hypothesized that:

H2: Green Energy significantly influence the Sustainability.

Economic development and organizational health are important factors that influence the knowledge base of the finance industry and boost economic expansion. Additionally, it contributes significantly to economic growth by lowering obstacles to investment and expediting the procedures for financial support. According to Masuda et al. (2022), this promotes trust between investors and customers, which in turn facilitates business expansion and stimulates consumer spending on higher-value items. These benefits of contemporary banking markets are not without a price, though. The global economy faces a big problem in maintaining environmental sustainability in this era of fast economic growth. Resources are viewed as assets by the world economy of a country. Large businesses and assets can now be leveraged by developing countries, but the ecosystem suffers as a result of these sources of income and reckless resource use. In industrialized nations, petroleum, petrol, and coal are the main causes of environmental harm (Zhabko et al., 2019). Examining the SDGs embraced in developed and developing economies has received a lot of interest in the literature since the creation of the Sustainable Development Goals for 2030. However, patterns in this research have shown that corporate groups and industries place little focus on taking into account green finance, clean energy, and the green economy as key factors influencing sustainable development practice (Ling et al., 2022; Qiao et al., 2022). Investment in renewable energy for sustainable development appears to be moving more quickly according to recent BRICS policy efforts. The dynamics of renewable energy and economic activity are examined for 17 G20 countries between 1980 and 2012 by Paramati et al. (2018) from the standpoint of sustainable development. The study's conclusions support a long-term equilibrium relationship between the variables and emphasize the important and advantageous role that renewable energy consumption plays in economic activity. This, in turn, ensures low carbon emissions and sustainable economic growth in the member states that were chosen. Based on these studies, it can be hypothesized that:

H3: Green Economic Development significantly influence the sustainability.

Technological advancement is currently one of the most powerful forces in the global effort to mitigate climate change. As noted by Sohag et al. (2021), innovations in technology are crucial in addressing the challenges of environment by providing new solutions to reduce carbon emissions and promote sustainable practices. The evolving landscape of environmental legislation has further bolstered the adoption of direct environmental technologies which drive steady progress in reducing CO₂ emissions through enhanced efficiency and cleaner production methods (Raihan et al., 2022b). One of the key ways technological innovations contribute to mitigation of climate change is by facilitating the shift from traditional, production-driven economic models to more sustainable, innovation-driven ones. This transition is pivotal in reducing CO₂ emissions, particularly in industries that have historically been major contributors to pollution (Sohag et al., 2015). Technological progress also plays an essential role in improving energy efficiency. With the development of advanced technologies, economies can achieve higher levels of production while consuming less energy, which not only boosts the performance of economy but also reduces environmental strain (Ratner et al., 2022; Sohag et al., 2015).

Moreover, the role of technological innovation in transitioning from depletable to renewable energy sources cannot be overstated. Advances in renewable energy technologies, such as solar, wind, and battery storage systems, have made it possible for economies to meet the growing energy demands while significantly lowering CO₂ emissions which are associated with fossil fuel consumption. By enabling cleaner energy production and reducing reliance on fossil fuels, technological innovations directly contribute to a reduction in energy consumption and overall greenhouse gas emissions. As a result, the continued progress in these technologies holds promise for creating a more sustainable and climate-resilient global economy. The dynamic relationship between sustainable development and the green economy is explored by Lavrinenko et al. (2019). The goals of sustainable development and green growth through clean energy technologies are complimentary, as noted by international policymakers, according to Barbier (2011), who also notes the policy issues facing the green economy and sustainable economic development. However, he argues that as long as environmental deterioration persists, green growth cannot provide sustainable economic development. Belmonte-Ureña et al. (2021), analyze the existing

academic discourse on sustainable development in light of the SDGs, which adds significantly to the body of literature.

Introduced in the 1990s, green innovation signifies a shift from prevailing production technologies to the adoption of inventive products and processes. This transition aligns with economic, environmental, and social considerations, coupled with adherence to environmental regulations, aimed at bolstering sustainable industries and long-term production (OECD, 2022). Studies underscore the imperative for green innovation and eco-friendly technologies, emphasizing their role in facilitating environmental and social initiatives (Galdeano-Gómez et al., 2013). Albort-Morant and Oghazi (2016) illustrated two key advantages of incorporating environmentally friendly technologies in business: (1) economic benefits that can shape a competitive edge and (2) commercial benefits in the production of environmentally friendly products. Based on all these studies, it can be hypothesized that:

H4: Green Finance significantly influence the sustainability through technological innovation.

Data and Methodology

Data

To investigate the dynamic impact of Green Finance (GF), Green energy (GE) and Green Economic Development (ED) on sustainability (SUS) through technological innovation in G-20 countries. This study uses panel data from 2011 to 2020 due to the availability of consistent and comprehensive data on key variables, such as green finance, GDP, technological innovation, and sustainability practices. Further, these years are marked by the policy shifts, such as the adoption of the Paris Agreement in 2015, which set clear climate goals for countries, and the increasing focus on green finance and investments in renewable energy. Green Finance is proxied using renewable energy consumption (Wu & Trinh, 2021), Green energy is measured by Natural resource Rent, Green Economic Development is proxied using productivity of CO₂, Sustainability was measured by CO₂ emission and patents were used as proxy for Technological innovation (Zhang & Lu, 2017). This dataset consists of annual observations for each variable, totaling 200 observations (20 countries over 10 years) for empirical analysis. The data for green finance, GDP, trade openness, sustainability practices and technological innovation was obtained from WDI. Trade openness is the sum of a country's exports and imports of goods and services which is expressed as a percentage of its Gross Domestic Product (GDP). This indicator reflects the degree of an economic integration of a country with the global economy, where higher values indicate a more open economy. Whereas, data for green economic development were obtained from the OECD. In a panel framework, the transformed log-linear model's augmented multivariate function is given as follows:

$$\ln \text{SUS}_{it} = \alpha + \beta_1 \text{GF}_{it} + \beta_2 \text{GE}_{it} + \beta_3 \text{ED}_{it} + \beta_4 \text{TI}_{it} + \beta_5 \text{GDP}_{it} + \beta_6 \text{TO}_{it} + \varepsilon_{it}$$

where α is constant term, $\beta_1, \dots, \beta_6$ show how flexible Sustainability practices are with green finance, green economic development, green energy, trade openness, GDP and technological innovation. Individual cross-sections are denoted by the letters i and, t which stand for time (2011–2020). The measurement and the source of the parameters are illustrated in Table 1.

Table 1

Measurement and Description of Variables

Abbreviations	Variables	Description	Sources
GF	Green Finance	Renewable Energy Consumption	WDI
GE	Green Energy	Natural resource rent	WDI
ED	Green Economic Development	Productivity of CO ₂	OECD
SUS	Sustainability practices	CO ₂ emission	WDI

TI	Technological Innovation	Patent non-resident+ OECD
GDP	Gross Domestic Product	Patent resident Per Capita GDP growth (Annual percentage) WDI
FDI	Foreign Direct Investment	FDI, Net Inflow (percentage of GDP) WDI
TO	Trade Openness	% of GDP WDI

3.2 Methodological framework

This research is carried out with the cross-sectional dependency test, panel unit root test, casualty test, and panel estimation technique.

Cross-Sectional Dependency Test

The problem of cross-sectional dependence (CSD) is often ignored by longitudinal data analysis since it compromises the validity of methods, and leads to the generation of ambiguous results and bias. CSD emerges when there are unobservable characteristics that are inherent in all cross-sectional units which leads to cross-sectional dependence (Pesaran, 2007). Some of the leading causes of CSD are proximity, globalization, spatial factors and economic interdependence. Ignoring CSD issues can lead to biased results in unit root and cointegration analyses (Yao et al., 2020). Thus, it is necessary to examine if CSD exists in each of the cross-sections. To address CSD, we employed three specific tests: These tests include (a) the Pesaran Common Correlated Effects (CSD) test following Pesaran (2004), (b) the Pesaran Scaled LM test following Pesaran (2004), and (c) the Bias-corrected LM test following Baltagi et al. (2012). These methods are especially appropriate for large panel datasets that include many cross-sectional units (De Hoyos & Sarafidis, 2006). Every test produces a test statistic under the assumption that the arrangement of the data is independent across sections and a significant outcome supports the existence of CSD in the data.

Unit Root Test

The next step in the econometric process after tests on cross-sectional dependence (CSD) is to test for the levels of stationarity or integration. To this end, we employ two other panel data cointegration estimators, namely panel data cointegration estimator 1 and panel data cointegration estimator 2. First, we employ the cross-sectional augmented Dickey-Fuller (CADF) test, which is a second-generation panel stationarity test suggested by Pesaran (2007). This method also takes care of cross-sectional dependence within the dataset which as a result provides a test statistic that encompasses the correlations thus making the results of stationarity to be more accurate. The CADF test is especially useful in a panel context where CSD issues are expected since it uses cross-sectional averages of lagged levels and first differences of the variables and provides useful information on the integration properties of the panel data under test. To support the result of using the CADF unit root test, another unit root test known as the Cross-Sectional Im-Pesaran-Shin (CIPS) test was applied. This methodology is very useful in controlling for heteroscedasticity and within-group serial correlation in panel datasets with cross-sectional dependence whereby data available across countries or regions may be interrelated.

Regression Analysis

We utilized Pesaran (2004) Fixed Effects — Ordinary Least Squares (FE-OLS) approach that enables the estimation of coefficients with fixed intercepts but allows for differing serial correlation of the panel variables. Consequently, the traditional panel data estimation method includes either fixed or random effects models. These issues suggest that the random-effects model is well-appropriate for unobserved heterogeneity across cross-sections, where some variables are fixed over time but vary across entities. Therefore, the random-effects model can be used when the cross-sections are ‘large’ and randomly selected within the sample (Hadri, 2000). The fixed effects model on the other hand eliminates the omitted variable bias by making it fixed over time so it is more appropriate to use it in smaller cross-sections (N). To determine the appropriate estimation technique for our models, we had to choose between the random-

effects and fixed-effects panel regression. The optimal method can be identified through the Hausman test, which helps assess whether the random-effects model is suitable. The null hypothesis of the Hausman test suggests that the random-effects model is appropriate. However, given the significant p-value obtained from the test, we reject the null hypothesis which led us to opt for the fixed-effects panel regression to analyse equation (1). The fixed-effects model accounts for heterogeneity or individuality across the countries by allowing each country to have its unique intercept. The term "fixed effect" refers to the fact that while the intercept varies across countries, it remains constant over time which make it time-invariant. This approach better captures the country-specific characteristics that influence the dependent variable which improve the robustness of our analysis.

The sample of our study consists of 20 cross-sections ($N = 20$) with 7 variables ($k = 7$) and with 200 observations ($T = 200$). Since all the presented data indicate that N is smaller than T ($N < T$), we used the FE-OLS method for estimation per the approach described by Anwar et al. (2021). Furthermore, following the method by Driscoll and Kraay (1998) and Ullah et al. (2021), we outlined the role of our explanatory variables on sustainability practices, including moderation effects, on the G-20 countries. The advantage of the Driscoll-Kraay approach is that it is designed to handle CD and provides sensible standard errors. This method involves using the heteroscedasticity and autocorrelation-consistent (HAC) estimator to estimate the average of the products between the explanatory variables and residuals.

Casualty Test

To conduct causality analysis, the Dumitrescu and Hurlin (2012) causality test is employed which is developed from the Granger causality test developed in 1969 and involves averaging the Wald statistics for the raw cross-section data in a non-parametric manner. The test is used in the analysis of panel data to define the direction of causality between those variables. The null hypothesis postulates that there is no causality between the given variables while the alternative hypothesis holds the contrary and points to the existence of a causality between the chosen variables. It is flexible in the sense that it permits different forms of heterogeneity across sections enabling it to be used effectively in panel data analysis. It gives a sound analysis of the relationships as well as dependencies in the data set.

Empirical Results and Discussion

Descriptive Statistics

The table 2 presents descriptive statistics for several variables: Sustainability (Sus), Green Energy (GE), Green Finance (GF), Gross Domestic Product (GDP), Economic Development (ED), Technological Innovation (TI) and Trade Openness (TO). Co-efficients of mean values show that generally negatives exist for both; GE, and for ED; -0.013, and -0.040, respectively whereas positives are seen for; GF, TI, and TO; with mildly positive mean effect, 0.017, 0.045, and 0.018 respectively were estimated. Mean for GDP is also slightly positive skewed with a mean value of 0.001. However, the medians are slightly in different value compared to the means with GE, ED, and Sus having negative median while GF, TI and GDP having positive median. This implies that the mean values could be skewed by a few high or low values especially in the case of GE and ED. The maximum and minimum values reveal a broad range in all variables, with extreme values particularly evident in GDP, where the maximum is 6.301 and the minimum is -6.021. Similarly, GF and GE exhibit high variability, as their maximum and minimum values are notably far apart, reflecting a substantial spread in the data.

Table 2

Descriptive Statistics

	Sus	GE	GF	GDP	ED	TI	TO
Mean	0.006	-0.013	0.001	-0.040	-0.001	0.032	-0.003
Median	-0.011	-0.094	0.019	-0.045	0.019	0.018	-0.007

Maximum	2.108	4.236	5.036	6.301	1.242	4.537	1.215
Minimum	-1.946	-2.876	-5.919	-6.021	-1.091	-5.133	-0.645
Std. Dev.	0.346	0.728	0.639	1.018	0.234	0.889	0.171
Skewness	0.938	1.997	-1.801	0.602	-0.496	-1.256	1.948
Kurtosis	21.702	16.391	60.563	16.843	17.064	20.654	20.087
Jarque-Bera	2796.970***	1545.980***	26334.675***	1520.601***	1573.560***	2517.361***	2431.595***

Notes: The table shows the summary statistics. The Jarque-Bera test (***) indicates all variables deviate significantly from normality, with high skewness and kurtosis which suggests non-normal distributions.

From the skewness statistics it is apparent that the Sus, GE and TO are positively skewed with the ‘long tail’ to the right while the GF, GDP, ED and TI are negatively skewed with the ‘long tail’ to the left. The kurtosis values for all variables are larger than 3, which means the variables are leptokurtic or have fat-tailed distrion, in others words, there are outliers in the data. The high Jarque-Bera test statistics of which all are significant at 1% level confirms this finding that none of the variables is normally distributed notwithstanding the moderate deviations from normality noted on all the four measurements

Result of Cross-sectional Dependency

The results of the cross-sectional dependency (CSD) tests presented in Table 3 which indicate significant evidence of CSD across variables at the 1% significance level. This confirms that shocks, whether positive or negative which affects a variable in one country are likely to influence the same variable in other countries within the panel. The Breusch-Pagan LM, Pesaran scaled LM, bias-corrected scaled LM, and Pesaran CD tests collectively provide robust evidence of interdependence, with consistent rejection of the null hypothesis of no CSD. For variables such as GE, GF, ED, TI, TO, and SUS the significant test statistics confirm strong interconnectivity among the countries. Specifically, the Breusch-Pagan LM test, which is suitable for larger panels, shows very high values (e.g., GE: 766.8331, and GF: 1160.6 which indicate pronounced dependence. The Pesaran scaled LM and bias-corrected scaled LM tests which are designed to address size distortions in finite samples, also yield significant results across most variables. These findings reinforce the robustness of the observed interdependence.

However, the Pesaran CD test, which is more effective in smaller panels and detects average pairwise correlation, shows nuanced results. For instance, while GE, GF, ED, and TO exhibit significant dependence at the 1% or 5% level, SUS and TI yield non-significant or even negative test statistics. This variation suggests that while cross-sectional dependence is a general feature of the dataset, its intensity may vary across variables which is possibly influenced by the nature of the variable or regional heterogeneity. Given the strong evidence of cross-sectional dependency, a fixed-effects model was employed in the FE-OLS estimation to account for unobserved heterogeneity and mitigate biases which arises from interdependence. The approach aligns with the methodological recommendations of Hunjra et al. (2020) and ensures the reliability of parameter estimates in the presence of CSD.

Table 3

Cross-sectional dependency

	Breusch-Pagan LM	Pesaran scaled LM	Bias-corrected scaled LM	Pesaran CD
GE	766.8331***	32.21896***	31.16341***	7.321413***
GF	1160.6***	53.51142***	52.45587***	5.109877***
ED	1065.238***	48.35488***	47.29932***	2.468514***

SUS	1345.575***	63.51373***	62.45818***	0.546265
TI	1270.45***	59.45142***	58.39587***	-1.34226
GDP	173.6999***	0.145993***	-0.90956***	2.174251
TO	850.9355***	36.7667***	35.71114***	2.161433**

Note: *** shows the 1% level of significance.

4.3 Results of Unit Root Test

In this study, the panel unit root tests were performed using the CADF and CIPS methods, which account for cross-sectional dependence (CSD) as per Pesaran (2007). The results from the CIPS and CADF tests show a order of integration among the variables. All variables are stationary at level, as indicated by a significant test statistic. Similarly, the CADF test also confirms the stationarity of all variables, with strong significance as shown in Table 4.

Table 4

CIPS and CADF Unit Root Test

Variables	CIPS		CADF	
	1(0)	1(1)	1(0)	1(1)
GE	-5.80***	-	-1.969*	-
GF	-5.11***	-	-3.462***	-
ED	-10.56***	-	-2.191**	-
SUS	-4.31***	-	-3.994***	-
TI	-5.30***	-	-2.374**	-
GDP	-2.28***	-	-3.939***	-
TO	-10.90***	-	-2.072*	-

Notes: The CIPS and CADF unit root tests were applied to assess stationarity. The values for each variable indicate significance levels, where *** represents 1%, ** denotes 5%, and * denotes 10%.

However, Green Finance (GF) is stationary at levels, with both CIPS and CADF tests rejecting the null hypothesis of non-stationarity at the 1% significance level. Economic Development (ED), Sustainability (SUS), Technological Innovation (TI), Green Energy (GE), Trade Openness (TO), and Gross Domestic Product (GDP) are found to be stationary at levels, with significant test statistics at 5% or 10% levels in both tests. Since, our results shows that all variables are stationary at level so there is no need for differencing. The lag length for the unit root tests was determined automatically on the basis of standard information criteria, such as the Akaike Information Criterion (AIC) or Bayesian Information Criterion (BIC), to ensure optimal lag selection. This approach helps to minimizes the serial correlation in residuals while avoiding overfitting. By adhering to this selection method, the reliability of the stationarity results is reinforced, and the tests are robust against misspecification.

Results of Regression Analysis

Table 5 presents the estimates of the Fixed Effect OLS regression that illustrate the significance of core variables prospective to latent sustainability experiences. Green Finance (GF) is positively correlated with sustainability, with a 1% increase in GF leading to a 0.071% and 0.063% rise in sustainability in Models 1 and 2, respectively. This confirms that sustainable green finance can encourage a better environment by offering funding and promotion for more energy-efficient technologies and reducing the detrimental impacts of environmental depreciation agreeing with earlier studies done by Shahbaz et al. (2018) and Zafar et al. (2019).

Table 5
Fixed effect OLS

Variable	1	2
Constant	0.004 (0.030)	0.001 (0.016)
GE	-0.163*** (0.030)	-0.159*** (0.030)
GF	-0.181*** (0.029)	-0.210*** (0.035)
ED	-0.912*** (0.101)	-0.853*** (0.110)
TI	0.039* (0.026)	0.041* (0.026)
GDP	0.024* (0.017)	0.023* (0.017)
TO	0.513*** (0.121)	0.522*** (0.121)
GF*TI		-0.030** (0.013)
R ²	0.632	0.615
Adjusted R ²	0.575	0.600
Regression SE	0.226	0.219
F statistics	11.20	41.41
Prob (F statistics)	0.000	0.000
Durbin Watson test	1.327	1.24

*Notes: Standard errors are shown in parentheses. Statistical significance is indicated by *** denotes 1%, ** represents 5%, and * denotes 10%. R² and Adjusted R² show the model's explanatory power, with higher values indicating better fit.*

Economic Development (ED) has a strong and statistically significant positive impact on sustainability, with a 1% increase in ED resulting in a decrease of economic development -0.912% and -0.853% improvement in sustainability across both models. This means that any attempt to improve environmental policies and practices are essential for the realization of sustainability objectives. Previous literature also establishes the relationship between efforts toward environmental development such as pollution control efforts, and the adoption of renewable energy sources for quality environmental improvement (Saud et al., 2019; Shahbaz et al., 2018).

Technological Innovation (TI), however, shows a significant negative correlation with sustainability, with a 1% increase in TI leading to a 0.039% and 0.041% increase in sustainability in Models 1 and 2, respectively. These results align with the previous study of Cao (2023) who found that Technological innovation and scientific research and development (R&D) are widely accepted as important sources of growth to an economy making them focal areas of interest to economists. The process works as follows: Technological and innovation activities generate new knowledge and improvements in efficiency that occur in micro, meso and macro levels—firm, industry, and country levels. As productivity increases it means that the returns on investment rise hence higher incomes and better and durable economic progress. As a result, it will be possible to observe that the level of investment in R&D positively impacts the countries' economic performance. On the other hand, inefficient R&D means that the resources invested in research and development may yield a lower return in the future for the countries involved.

Moreover, green energy is negatively and significantly related to sustainability. This means a 1% increase in investment in renewable energy projects will lead to a reduction in carbon emissions of -0.163%. Muganyi et al. (2021) noted that energy security necessitates governments to increase the use of renewable energy sources across multiple sectors. However, to support the sustainable development of the economy, governments need to encourage investment in renewable energy projects, which play a significant role of fighting climate change. Therefore, by increasing the share of clean and renewable energy in the total

supply, we can, to some extent, reduce the pace of environmental degradation and promote further climate change mitigation. Green Finance (GF) is negatively associated with sustainability. This means 1% increase in investment in renewable sources can result in a decrease in the value of carbon dioxide emission by -0.181%. Green production implies the use of a lesser degree of pollutive technologies in production processes in financial investment, which is in line with the objectives of green financial development. Khan et al. (2022) have stated that there are indeed high possibilities of increasing the level of environmental sustainability with such investments. Chen and Chen (2021) have pointed out that green financial networks (GFN) have a great influence on consumers and organizations making them shift towards using products that are eco/logically friendly and those that do not contribute to excessive emission of greenhouse gases. This shift is not only good for the environment but is also part of a push toward sustainable initiatives. Research findings also corroborate these observations indicating that GF is the useful and efficient financial strategy in enhancing environmental sustainability. Nawaz et al. (2021) and Shen et al. (2021) have highlighted that GF plays a crucial role in the overall enhancement of sustainable development and realization of environmental objectives.

GDP is also positively associated with sustainability, with a 1% increase in GDP leading to a 0.024% and 0.023% increase in sustainability. This relationship sustains the hypothesis of the Environmental Kuznets Curve (EKC) in line with the assumption that economic development directly results in environmental degradation before positive changes happen when the development reaches some certain level (Charfeddine et al., 2018; Özokcu & Özdemir, 2017).

An interesting finding from Model 2 is the interaction between Economic Development and Technological Innovation ($GF*TI$), which has a significant and negative impact on sustainability. A 1% increase in this interaction leads to a -0.030 % decrease in sustainability which implies that during the early stages of such innovations, there might be resource-intensive processes, for instance; production and installation of new technologies, which could lead to a temporary increase in emissions and environmental costs before achieving the desired sustainability benefits (Sohag et al., 2021c). This phase of transition could explain the negative relationship between technological innovation and sustainability, as it reflects the complex dynamics of innovation adoption and impact of an environment. Additionally, the interaction term's negative impact point that technological innovation is being implemented in regions or sectors where green finance policies are not fully aligned with the environmental goals. This misalignment could result in inefficient allocation of resources where investments in technology are not accompanied by the necessary policy frameworks or market incentives to drive substantial sustainability improvements. In this context, technological innovation may be underutilized or misdirected which dampen its effectiveness in reducing carbon emissions and promoting long-term sustainability (Shahbaz et al., 2018). The models show strong explanatory power, with R-squared values of 0.632 and 0.615 which indicate that the included variables explain a substantial portion of the variation in sustainability. These findings highlight the importance of green finance, economic development, green energy, and the integration of technological innovation with environmental policies in driving sustainable outcomes which is consistent with earlier research (Saud et al., 2019; Tamazian et al., 2009).

Results of the Robustness Test

The results in Table 6 display robust outcomes using Driscoll–Kraay (D-K) standard error estimation, providing consistent findings with the earlier FE-OLS estimations. Specifically, the variables Green Finance (GF), Economic Development (ED), Green Energy (GE), Technological Innovation (TI), Trade Openness (TO), and Gross Domestic Product (GDP) show significant relationships in both models. GF has a strong negative impact on carbon emission, as indicated by the highly significant coefficients (-0.181% and -0.210%) in both models, which aligns with prior literature on the role of green finance in enhancing environmental outcomes (Zafar et al., 2019). The results in Table 6 present comparable results applying the Driscoll-Kraay (D-K) standard error estimations which yield similar findings as the FE-OLS estimations. Indeed, Green Finance (GF), Economic Development (ED), Technological Innovation (TI), and Gross Domestic Product (GDP) present a strong correlation in both models. The findings of this study

also reveal that GE has a highly significant and negative effect on CO₂ emission with highly significant coefficients (-0.163% and -0.159%) in both models which is consistent with the existing literature on the effect of green energy on sustainability (Wang et al., 2021). ED in the same way also shows a negative and significant effect indicating that economic development can reduce carbon emissions to a greater extent and the coefficients are -0.912% and -0.853% in both models.

Table 6

Robust outcomes using standard error estimate from Driscoll–Kraay (DK)

Variable	1	2
Constant		0.001* (0.009)
GE	-0.163*** (0.044)	-0.159*** (0.042)
GF	-0.181*** (0.013)	-0.210*** (0.007)
ED	-0.912*** (0.083)	-0.853*** (0.089)
TI	0.039** (0.010)	0.041*** (0.011)
GDP	0.020* (0.018)	0.023* (0.016)
TO	0.513*** (0.044)	0.522*** (0.039)
GF*TI		-0.051*** (0.011)
N group	20	20
F statistics	5728.7	7649.68
Prob (F statistics)	0.000	0.000
R squared	0.596	0.600

*Notes: Standard errors are shown in parentheses. Statistical significance is indicated by *** denotes 1%, ** represents 5%, and * denotes 10%. R² and Adjusted R² show the model's explanatory power, with higher values indicating better fit.*

On the other hand, TI is significantly positive and the coefficients for this variable are 0.039 and 0.041%, it seems that CO₂ is directly related to technological innovation in this regard. Ahmed and Jahanzeb (2020) discussed the impact of technological change on CO₂ emissions in the context of Brazil. They found that an increase in exports calls for increased technological advancement and also economic growth promotes technological advancement. Thus, this advancement in technology helps in reducing the levels of emission of CO₂. GDP, although relatively small, shows a positive association with environmental degradation in both models, with coefficients of 0.020 and 0.023, suggesting that economic growth continues to be a driver of CO₂ emissions, supporting the Environmental Kuznets Curve (EKC) hypothesis. Thus, Model 2 reveals that the interaction between GF and TI is negative and statistically significant at -0.051%, which implies that, when supported by technological innovation, investment in renewable sources efforts will help result in decreasing carbon emissions.

The high R-squared values (0.596 & 0.600) in both models further highlight the robustness of the findings which shows that the variables collectively explain a significant portion of the variance in environmental outcomes. Additionally, the F-statistics and their associated probabilities confirm the overall significance of the models.

Additional Analysis

The impact of the 2015 climate policy on sustainability outcomes was examined using a Difference-in-Differences (DiD) approach. The DiD model estimates the causal effect of policy adoption on sustainability by comparing policy adopters (treatment group) and non-adopters (control group) before and after the 2015 policy implementation.

Table 7

Difference-in-Difference Method

Sustainability	
Policy Adopters	1.169***(0.376)
Policy adopters*Post Policy Adopter	0.756***(0.218)
Year fixed effect	Included
Constant	0.051**(0.03)
Adj.R ²	0.224

*This table provides the result of the difference in the difference analysis of the 2015 climate policy's impact on sustainability outcomes is shown in this table. The following are the model's specifications: Sustainability = $\alpha + \beta_1$ Policy Adopter + β_2 (Year Dummy) + β_3 (Policy Adopter $\times$ Post-2015) + ϵ_{it} . A dummy variable in this model called Policy Adopter indicates whether a nation is in the treatment group, which means it embraced the 2015 climate policy. A dummy variable called "post-2015" has a value of 1 for the time after the 2015 policy's introduction and 0 for the time prior. The impact of being a policy adopter throughout the post-2015 era is captured by the interaction term, Policy Adopter * Post-2015.*

With a coefficient of 1.169 ($p < 0.01$), the regression results show that policy adopters had a significantly higher sustainability score than non-adopters prior to the 2015 climate policy. Policy Adopters * Post Policy Adopter's interaction term is 0.756 ($p < 0.01$), indicating that the policy significantly and favorably impacted adopters' sustainability, raising their score by 0.756 units above that of non-adopters following implementation.

Robustness Analysis

The Generalized Method of Moments (GMM) is a widely used estimation technique in econometrics, particularly for panel data. It is designed to address issues of endogeneity that arise when explanatory variables are correlated with the error term. GMM uses instrumental variables, which are uncorrelated with the error term but correlated with the endogenous regressors, to produce consistent and efficient parameter estimates. This method is particularly useful in dynamic panel data models and when dealing with potential reverse causality and omitted variable bias.

Table 8

System GMM

Variable	
Constant	0.401 (0.127)
GE	-0.082*** (0.041)
GF	-0.124* (0.070)
ED	-6.026*** (1.114)
TI	0.090* (0.069)
GDP	0.057** (0.008)
TO	0.012** (0.089)
Sargan	0.632
AR1	0.020
AR2	0.065

*Notes: The table presents the results of the Generalized Method of Moments (GMM) estimation. Standard errors are reported in parentheses. Statistical significance is denoted by *** at the 1% level, ** at the 5% level, and * at the 10% level. The Sargan test confirms the validity of the instrumental variables used in*

the estimation. AR1 and AR2 represent the p-values for the Arellano-Bond test for first-order and second-order autocorrelation, respectively.

The results of the GMM estimation reveal significant insights into the relationships between the variables and their impact on sustainability. The constant term is positive but statistically insignificant which suggests that sustainability outcomes do not have a substantial baseline effect in the absence of explanatory variables. Green Energy (GE) has a negative and statistically significant coefficient which indicates that an increased reliance on green energy currently contributes to a reduction in the dependent variable. This could reflect challenges in the efficiency or scope of green energy implementation. Similarly, Green Finance (GF) exhibits a negative and moderately significant impact which point to potential limitations in the mechanisms of green finance to fully address sustainability challenges. Economic Development (ED) demonstrates a strongly negative and highly significant effect which emphasize the pressing need for integrating sustainability measures within economic growth strategies to mitigate environmental harm. On the other hand, Technological Innovation (TI) positively influences sustainability, albeit modestly, highlighting its role as a supportive factor in achieving the outcomes of sustainable. Gross Domestic Product (GDP) and Trade Openness (TO) both show positive and statistically significant effects which suggest that economic growth and openness to trade enhance sustainability by enabling access to cleaner technologies and sustainable practices. The diagnostic tests validate the robustness of the model. The Sargan test confirms the validity of the instruments used, while the absence of second-order autocorrelation which is indicated by the AR2 test, ensures the reliability of the results. However, the presence of first-order autocorrelation (AR1) is consistent with expectations in GMM models, affirming the appropriateness of the estimation technique

Conclusion and Policy Implications

This research study aims to investigate the moderating role of Green Finance, Green Energy, Green Economy Development, and Technological Innovation on sustainable performance in the context of G20 countries. The study also shows that Green Finance has a negative impact on sustainability as it fosters investment in energy efficiency technology and minimizes environmental pollution. Likewise, Economic Development has a significant negative impact on reducing carbon emissions which in turn highlights the need to implement good environmental policies and standards. However, Technological Innovation is directly related to sustainability which shows that innovation may results in reduced carbon emission and greener environment. In line with earlier studies, this result suggests and stresses the challenges associated with technological advancement and environmental conservation. Moreover, the results indicate a significant inverse correlation between the dependent variable and sustainability in relation to the EKC hypothesis, which suggests that economic growth causes harm to the environment before reaching a level where sustainable improvements occur.

One of the key findings of the study is the synergy between Green Finance and Technological Innovation. Technological changes make a negative contribution to sustainable development results when they are aligned with effective environmental development initiatives. This shows that there is the possibility of innovation and environmental policies to be complementary to bring about sustainable growth. Given the conclusions derived from this investigation, the results are of sheer importance as they can assist the G20 countries in fulfilling their environmental development obligations under the Paris Climate Agreement and the UN SDGs. Although some of the G20 countries have limitations in terms of capacity to fully adhere to these commitments, this research outlines the way forward for the improvement of the situation toward compliance through policy-based decision-making. Considering the goal of achieving environmentally sustainable development in G20 countries, the following policy implications are suggested for stakeholders, governments, and policymakers based on the estimated outcomes.

The study provides several policy implications based on its findings. Firstly, it demonstrates that Green Finance is effective in reducing the carbon emissions by facilitating the financing of energy-efficient technologies and sustainable initiatives. To strengthen Green Finance, it is recommended that governments should introduce specific policy instruments such as tax incentives for green investments,

subsidies for renewable energy projects, and the establishment of green bonds markets to channel private investment into sustainability-focused projects. These measures would not only drive the adoption of clean technologies but also mitigate the environmental harm which are caused by extraction of fossil fuel.

Secondly, the study finds that Economic Development negatively influences the carbon emissions which emphasize the need to integrate environmental considerations into economic policy frameworks. Policymakers could adopt strategies such as implementing carbon pricing mechanisms (e.g., carbon taxes or cap-and-trade systems) to internalize the environmental costs of development. Additionally, mandatory environmental impact assessments (EIAs) for large-scale development projects and incentivizing resource-efficient industrial practices could ensure that economic growth aligns with the goals of environmental conservation.

Thirdly, the findings highlight the role of Technological Innovation in magnifying the effectiveness of Green Finance in achieving sustainability. Governments should prioritize funding for research and development (R&D) in green technologies which include grants and public-private partnerships that are more focused on clean energy, energy storage, and carbon capture solutions. Moreover, creating innovation hubs and tax credits for green startups can foster technological advancements and expedite their deployment.

Firstly, the transition to green energy often requires substantial upfront investments in infrastructure and technology, which can temporarily increase the use of resources and emissions during the development phase. For instance, the production of solar panels, wind turbines, and batteries requires energy-intensive processes. Manufacturing these renewable energy technologies, for instance, the mining of materials for solar panels and the production of batteries for energy storage, involves significant carbon emissions. If the supply chain is not fully sustainable, it can offset the short-term environmental benefits. Research by BNEF (2020) highlights that, while renewable energy technologies have lower operational emissions, the manufacturing phase can still result in a significant environmental cost, especially when sourced from non-renewable energy-dependent production processes. Moreover, the need for a rare earth minerals and metals used in renewable technology can also have detrimental social and environmental impacts, particularly when sourced from a region with weak environmental standards (World Bank, 2020).

Furthermore, the implementation of green energy solutions in certain regions may still rely on conventional energy systems during the transition period which leads to an initial increase in carbon emissions before renewable sources fully replace the fossil fuels. Additionally, the negative impact of Green Energy on sustainability in this study could also be linked to the limited scope of a current renewable energy adoption in many G20 countries. While the renewable energy sector is expanding, it may not yet be large enough to fully mitigate the environmental impacts of traditional energy sources in some regions. REN21 (2021) notes that while global renewable energy capacity is increasing, many G20 countries still rely heavily on fossil fuels for base-load power generation which mean that adoption of renewable energy has yet to reach levels that can counterbalance the ongoing emissions from a conventional power plant.

Last but not the least to enhance the green financing ecosystem, the establishment of green funds, green exchanges, green banks, and green insurance schemes is important. Policymakers should also promote climate financialization practices, for instance, setting up public-private climate finance initiatives and adopting blended finance models to mobilize resources for large-scale green projects. Building an enabling regulatory environment, such as mandating disclosure of climate-related financial risks and providing credit guarantees for green loans, can further support green investment flows in G20 countries.

Limitation and Future Direction

The first and significant limitation of this study concerns the lack of data for recent years, which has limited the analysis period to 2011-2020. Future studies could also include social and cultural variables and study the moderating impact of institutional quality enhancements and technological advancement on sustainability and the time horizon could also be extended further. Other forms of estimation such as the

panel non-linear ARDL could also be employed to establish the asymmetric effects on environmental results in ASEAN countries.

References

- Ahn, S., Kim, K.S., & Lee, K.H. (2022). Technological capabilities, entrepreneurship and innovation of technology-based start-ups: The resource-based view. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(3), 156.
- Al Mamun, M., Boubaker, S., & Nguyen, D. K. (2022). Green finance and decarbonization: Evidence from around the world. *Finance Research Letters*, 46, 102807.
- Albort-Morant, G., & Oghazi, P. (2016). How useful are incubators for new entrepreneurs? *Journal of Business Research*, 69(6), 2125-2129.
- Arayssi, M., & Jizi, M. I. (2019). Does corporate governance spillover firm performance? A study of valuation of MENA companies. *Social Responsibility Journal*, 15(5), 597-620.
- Awais, M., Kashif, S., & Raza, A. (2020). Status Quo, Monetary Loss-Aversion and Forecasting – An Approach to Invest during Amygdala Damages and Asymmetry. *Global Social Sciences Review*, 5(3), 118-127.
- Awais, M., Khan, R., Hassan, S. T., & Ishaq, B. (2023). Navigating Risks in Islamic Microfinance: A Comparative Study of Operational, Credit, and Shariah Risks in Malaysian Institutions. *Journal of Research and Reviews in Social Sciences Pakistan*, 6(2), 2209-2217
- Awais, M., Shah, S. Z. A., Abidy, M. M., & Scholar, M. S. (2018). Do Countries Belonging to the same Continent Suggest the Same Investment, Growth, and Corruption Enhancing Variables? Evidence from Pakistan, India, & Russia. *Canadian International Journal of Social Science and Education*, 114.
- Baltagi, B. H., Feng, Q., & Kao, C. (2012). A Lagrange Multiplier test for cross-sectional dependence in a fixed effects panel data model. *Journal of Econometrics*, 170(1), 164-177.
- Barbier, E. (2011, August). The policy challenges for green economy and sustainable economic development. In *Natural Resources Forum* (Vol. 35, No. 3, pp. 233-245). Oxford, UK: Blackwell Publishing Ltd.
- Belmonte-Ureña, L. J., Plaza-Úbeda, J. A., Vazquez-Brust, D., & Yakovleva, N. (2021). Circular economy, degrowth and green growth as pathways for research on sustainable development goals: A global analysis and future agenda. *Ecological Economics*, 185, 107050.
- BNEF. (2020). The role of renewable energy in the decarbonization of the energy sector. Bloomberg New Energy Finance.
- Cao, L. (2023). How green finance reduces CO2 emissions for green economic recovery: Empirical evidence from E7 economies. *Environmental Science and Pollution Research*, 30(2), 3307-3320.
- Castellacci, F., & Lie, C. M. (2017). A taxonomy of green innovators: Empirical evidence from South Korea. *Journal of Cleaner Production*, 143, 1036-1047.
- Charfeddine, L., Al-Malk, A. Y., & Al Korbi, K. (2018). Is it possible to improve environmental quality without reducing economic growth: Evidence from the Qatar economy. *Renewable and Sustainable Energy Reviews*, 82, 25-39.
- Chen, X., & Chen, Z. (2021). Can green finance development reduce carbon emissions? Empirical evidence from 30 Chinese provinces. *Sustainability*, 13(21), 12137.
- De Hoyos, R. E., & Sarafidis, V. (2006). Testing for cross-sectional dependence in panel-data models. *The Stata Journal*, 6(4), 482-496.
- Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *Review of Economics and Statistics*, 80(4), 549-560.
- Dumitrescu, E.I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450-1460.
- Falcone, P. M., & Sica, E. (2019). Assessing the opportunities and challenges of green finance in Italy: An analysis of the biomass production sector. *Sustainability*, 11(2), 517.

- Fu, W., & Irfan, M. (2022). Does green financing develop a cleaner environment for environmental sustainability: Empirical insights from association of southeast Asian nations economies. *Frontiers in Psychology*, 13, 904768.
- Ghulam, S., Rizwan, M., & Awais, M. (2024). Operational Efficiency based Investment strategies and Equity Returns: Evidence from Emerging Economy. *Bahria University Journal of Management & Technology*, 7(1).
- Guang-Wen, Z., & Siddik, A. B. (2022). Do corporate social responsibility practices and green finance dimensions determine environmental performance? An Empirical Study on Bangladeshi Banking Institutions. *Frontiers in Environmental Science*, 10, 890096.
- Gabr, D. H., & Elbannan, M. A. (2024). Green finance insights: evolution of the green bonds market. *Management & Sustainability: An Arab Review*, 3(3), 274-297.
- Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *The Econometrics Journal*, 3(2), 148-161.
- Halbritter, G., & Dorfleitner, G. (2015). The wages of social responsibility—where are they? A critical review of ESG investing. *Review of Financial Economics*, 26, 25-35.
- He, L., Liu, R., Zhong, Z., Wang, D., & Xia, Y. (2019). Can green financial development promote renewable energy investment efficiency? A consideration of bank credit. *Renewable Energy*, 143, 974-984.
- Hernández-Chea, R., Mahdad, M., Minh, T. T., & Hjortsø, C. N. (2021). Moving beyond intermediation: How intermediary organizations shape collaboration dynamics in entrepreneurial ecosystems. *Technovation*, 108, 102332.
- Hillerbrand, R. (2018). Why affordable clean energy is not enough. A capability perspective on the sustainable development goals. *Sustainability*, 10(7), 2485.
- Huang, J.-W., & Li, Y.-H. (2017). Green innovation and performance: The view of organizational capability and social reciprocity. *Journal of Business Ethics*, 145, 309-324.
- Hunjra, A. I., Tayachi, T., Chani, M. I., Verhoeven, P., & Mehmood, A. (2020). The moderating effect of institutional quality on the financial development and environmental quality nexus. *Sustainability*, 12(9), 3805.
- Kang, K., Zhao, Y., Zhang, J., & Qiang, C. (2019). Evolutionary game theoretic analysis on low-carbon strategy for supply chain enterprises. *Journal of Cleaner Production*, 230, 981-994.
- Kartal, M. T., Kılıç Depren, S., Ayhan, F., & Depren, Ö. (2022). Impact of renewable and fossil fuel energy consumption on environmental degradation: evidence from USA by nonlinear approaches. *International Journal of Sustainable Development & World Ecology*, 29(8), 738-755.
- Kasztelan, A. (2017). Green growth, green economy and sustainable development: terminological and relational discourse. *Prague Economic Papers*, 26(4), 487-499.
- Khaled, R., Ali, H., & Mohamed, E. K. (2021). The Sustainable Development Goals and corporate sustainability performance: Mapping, extent and determinants. *Journal of Cleaner Production*, 311, 127599.
- Khan, I., Zakari, A., Ahmad, M., Irfan, M., & Hou, F. (2022). Linking energy transitions, energy consumption, and environmental sustainability in OECD countries. *Gondwana Research*, 103, 445-457.
- Khan, H. H. A., Ahmad, N., Yusof, N. M., & Chowdhury, M. A. M. (2024). Green finance and environmental sustainability: a systematic review and future research avenues. *Environmental Science and Pollution Research*, 31(6), 9784-9794.
- Kandpal, V., Jaswal, A., Santibanez Gonzalez, E. D., & Agarwal, N. (2024). Sustainable Financing for ESG Practices. In *Sustainable Energy Transition: Circular Economy and Sustainable Financing for Environmental, Social and Governance (ESG) Practices* (pp. 167-200). Cham: Springer Nature Switzerland.
- Kocmanová, A., Dohnal, M., & Meluzín, T. (2011). Qualitative equationless models as simple integrators of vague sustainability knowledge items. *Transformations in Business & Economics*, 11(3), 187-196.

- Kocmanová, A., & Šimberová, I. (2014). Determination of environmental, social and corporate governance indicators: framework in the measurement of sustainable performance. *Journal of Business Economics and Management*, 15(5), 1017-1033.
- Lavrinenko, O., Ignatjeva, S., Ohotina, A., Rybalkin, O., & Lazdans, D. (2019). The role of green economy in sustainable development (case study: the EU states). *Entrepreneurship and Sustainability Issues*, 6(3), 1113.
- Li, B., & Haneklaus, N. (2022). The potential of India's net-zero carbon emissions: Analyzing the effect of clean energy, coal, urbanization, and trade openness. *Energy Reports*, 8, 724-733.
- Li, J., Li, N., Peng, J., Cui, H., & Wu, Z. (2019). Energy consumption of cryptocurrency mining: A study of electricity consumption in mining cryptocurrencies. *Energy*, 168, 160-168.
- Li, M., Hamawandy, N. M., Wahid, F., Rjoub, H., & Bao, Z. (2021). Renewable energy resources investment and green finance: Evidence from China. *Resources Policy*, 74, 102402.
- Ling, G., Razzaq, A., Guo, Y., Fatima, T., & Shahzad, F. (2022). Asymmetric and time-varying linkages between carbon emissions, globalization, natural resources and financial development in China. *Environment, Development and Sustainability*, 24(5), 6702-6730.
- Liu, N., Liu, C., Xia, Y., Ren, Y., & Liang, J. (2020). Examining the coordination between green finance and green economy aiming for sustainable development: A case study of China. *Sustainability*, 12(9), 3717.
- Maltais, A., & Nykvist, B. (2020). Understanding the role of green bonds in advancing sustainability. *Journal of Sustainable Finance & Investment*, 1-20.
- Masuda, H., Kawakubo, S., Okitasari, M., & Morita, K. (2022). Exploring the role of local governments as intermediaries to facilitate partnerships for the Sustainable Development Goals. *Sustainable Cities and Society*, 82, 103883.
- Ma, M., Zhu, X., Liu, M., & Huang, X. (2023). Combining the role of green finance and environmental sustainability on green economic growth: Evidence from G-20 economies. *Renewable Energy*, 207, 128-136.
- Midilli, A., Dincer, I., & Ay, M. (2006). Green energy strategies for sustainable development. *Energy Policy*, 34(18), 3623-3633.
- Muganyi, T., Yan, L., & Sun, H.P. (2021). Green finance, fintech and environmental protection: Evidence from China. *Environmental Science and Ecotechnology*, 7, 100107.
- Nawaz, M. A., Seshadri, U., Kumar, P., Aqdas, R., Patwary, A. K., & Riaz, M. (2021). Nexus between green finance and climate change mitigation in N-11 and BRICS countries: empirical estimation through difference in differences (DID) approach. *Environmental Science and Pollution Research*, 28, 6504-6519.
- Ng, A. W. (2018). From sustainability accounting to a green financing system: Institutional legitimacy and market heterogeneity in a global financial centre. *Journal of Cleaner Production*, 195, 585-592.
- Ning, Y., Cherian, J., Sial, M. S., Álvarez-Otero, S., Comite, U., & Zia-Ud-Din, M. (2023). Green bond as a new determinant of sustainable green financing, energy efficiency investment, and economic growth: a global perspective. *Environmental Science and Pollution Research*, 30(22), 61324-61339.
- Niyazbekova, S., Jazykbayeva, B., Mottaeva, A., Belousova, E., Suleimenova, B., & Zueva, A. (2021). The Growth of "Green" finance at the global level in the context of sustainable economic development. In *E3S Web of Conferences* (Vol. 244, p. 10058). EDP Sciences.
- OECD. (2022). *OECD International Direct Investment Statistics 2021*. Paris: OECD Publishing.
- Özokcu, S., & Özdemir, Ö. (2017). Economic growth, energy, and environmental Kuznets curve. *Renewable and Sustainable Energy Reviews*, 72, 639-647.
- Paolone, F., Cucari, N., Wu, J., & Tiscini, R. (2022). How do ESG pillars impact firms' marketing performance? A configurational analysis in the pharmaceutical sector. *Journal of Business & Industrial Marketing*, 37(8), 1594-1606.

- Paramati, S. R., Apergis, N., & Ummalla, M. (2018). Dynamics of renewable energy consumption and economic activities across the agriculture, industry, and service sectors: evidence in the perspective of sustainable development. *Environmental Science and Pollution Research*, 25, 1375-1387.
- Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels. Cambridge Working Papers. *Economics*, 1240(1), 1.
- Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312.
- Plastun, A., Bouri, E., Gupta, R., & Ji, Q. (2022). Price effects after one-day abnormal returns in developed and emerging markets: ESG versus traditional indices. *The North American Journal of Economics and Finance*, 59, 101572.
- Polzin, F., & Sanders, M. (2020). How to finance the transition to low-carbon energy in Europe? *Energy Policy*, 147, 111863.
- PwC. (2019). SDG Challenge 2019: creating a strategy for a better world.
- Qiao, G., Ding, L., Zhang, L., & Yan, H. (2022). Accessible tourism: A bibliometric review (2008–2020). *Tourism Review*, 77(3), 713-730.
- Rasoulinezhad, E., & Taghizadeh-Hesary, F. (2022). Role of green finance in improving energy efficiency and renewable energy development. *Energy Efficiency*, 15(2), 14.
- Razzaq, A., Ajaz, T., Li, J. C., Irfan, M., & Suksatan, W. (2021). Investigating the asymmetric linkages between infrastructure development, green innovation, and consumption-based material footprint: Novel empirical estimations from highly resource-consuming economies. *Resources Policy*, 74, 102302.
- Raihan, A., Begum, R. A., Nizam, M., Said, M., & Pereira, J. J. (2022). Dynamic impacts of energy use, agricultural land expansion, and deforestation on CO2 emissions in Malaysia. *Environmental and Ecological Statistics*, 29(3), 477-507.
- Ratner, S., Salnikov, A. A., Berezin, A., Sergi, B. S., & Sohag, K. (2022). Customer engagement in innovative smart grid deployment projects: evidence from Russia. *Environmental Science and Pollution Research*, 29(4), 5902-5911.
- REN21. (2021). Renewables 2021 Global Status Report. Renewable Energy Policy Network for the 21st Century.
- Sachs, J., Woo, W. T., & Taghizadeh-Hesary, F. (2019). Handbook of green finance: Energy security and sustainable development. (No Title).
- Sarangi, G. K. (2018). *Green Energy Finance in India: Challenges and Solutions*.
- Saud, S., Chen, S., Danish, & Haseeb, A. (2019). Impact of financial development and economic growth on environmental quality: an empirical analysis from Belt and Road Initiative (BRI) countries. *Environmental Science and Pollution Research*, 26, 2253-2269.
- Shahbaz, M., Nasir, M. A., & Roubaud, D. (2018). Environmental degradation in France: the effects of FDI, financial development, and energy innovations. *Energy Economics*, 74, 843-857.
- Shahzad, M. A., & Riaz, M. (2022). Assessing the impact of green finance on environmental sustainability. *Journal of Policy Research (JPR)*, 8(3), 196-220.
- Shan, S., Genç, S. Y., Kamran, H. W., & Dinca, G. (2021). Role of green technology innovation and renewable energy in carbon neutrality: A sustainable investigation from Turkey. *Journal of Environmental Management*, 294, 113004.
- Shen, Y., Su, Z.-W., Malik, M. Y., Umar, M., Khan, Z., & Khan, M. (2021). Does green investment, financial development and natural resources rent limit carbon emissions? A provincial panel analysis of China. *Science of the Total Environment*, 755, 142538.
- Sinha, A., Mishra, S., Sharif, A., & Yarovaya, L. (2021). Does green financing help to improve environmental & social responsibility? Designing SDG framework through advanced quantile modelling. *Journal of Environmental Management*, 292, 112751.
- Sohag, K., Begum, R. A., Abdullah, S. M. S., & Jaafar, M. (2015). Dynamics of energy use, technological innovation, economic growth and trade openness in Malaysia. *Energy*, 90, 1497-1507.

- Sohag, K., Taşkın, F. D., & Malik, M. N. (2019). Green economic growth, cleaner energy and militarization: Evidence from Turkey. *Resources Policy*, 63, 101407.
- Sun, Y., Duru, O. A., Razzaq, A., & Dinca, M. S. (2021). The asymmetric effect eco-innovation and tourism towards carbon neutrality target in Turkey. *Journal of Environmental Management*, 299, 113653.
- Strand, F. (2024). ESRS Implementation and its Effect on Green Bonds within the Built Environment—Case Sweden and Norway: An Analysis of Green Bonds during Rising Interest Rates, based on Behavioural Economic Theory Nudging.
- Tamazian, A., Chousa, J. P., & Vadlamannati, K. C. (2009). Does higher economic and financial development lead to environmental degradation: evidence from BRIC countries. *Energy Policy*, 37(1), 246-253.
- Tolliver, C., Keeley, A. R., & Managi, S. (2019). Green bonds for the Paris agreement and sustainable development goals. *Environmental Research Letters*, 14(6), 064009.
- Udeagha, M. C., & Ngepah, N. (2019). Revisiting trade and environment nexus in South Africa: fresh evidence from new measure. *Environmental Science and Pollution Research*, 26(28), 29283-29306.
- Udeagha, M. C., & Ngepah, N. (2023). The drivers of environmental sustainability in BRICS economies: do green finance and fintech matter? *World Development Sustainability*, 3, 100096.
- Ullah, A., Kui, Z., Ullah, S., Pinglu, C., & Khan, S. (2021). Sustainable utilization of financial and institutional resources in reducing income inequality and poverty. *Sustainability*, 13(3), 1038.
- UNEP. (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. https://sustainabledevelopment.un.org/content/ocuments/126GER_synthesis_en.pdf
- Wang, K.H., Umar, M., Akram, R., & Caglar, E. (2021). Is technological innovation making world "Greener"? An evidence from changing growth story of China. *Technological Forecasting and Social Change*, 165, 120516.
- Wang, Y., & Zhi, Q. (2016). The role of green finance in environmental protection: Two aspects of market mechanism and policies. *Energy Procedia*, 104, 311-316.
- World Bank. (2020). Minerals for climate action: The mineral intensity of the clean energy transition. World Bank Group.
- Wu, X., Sadiq, M., Chien, F., Ngo, Q. T., Nguyen, A. T., & Trinh, T. T. (2021). Testing role of green financing on climate change mitigation: Evidences from G7 and E7 countries. *Environmental Science and Pollution Research*, 28, 66736-66750.
- Yang, Q., Du, Q., Razzaq, A., & Shang, Y. (2022). How volatility in green financing, clean energy, and green economic practices derive sustainable performance through ESG indicators? A sectoral study of G7 countries. *Resources Policy*, 75, 102526.
- Yao, Y., Ivanovski, K., Inekwe, J., & Smyth, R. (2020). Human capital and CO2 emissions in the long run. *Energy Economics*, 91, 104907.
- Zafar, M. W., Saud, S., & Hou, F. (2019). The impact of globalization and financial development on environmental quality: evidence from selected countries in the Organization for Economic Co-operation and Development (OECD). *Environmental Science and Pollution Research*, 26, 13246-13262.
- Zhabko, A. P., Shindyapin, A. I., & Provotorov, V. V. E. (2019). Stability of weak solutions of parabolic systems with distributed parameters on the graph. *Вестник Санкт-Петербургского университета. Серия 10. Прикладная математика. Информатика. Процессы управления*, 15(4), 457-471.
- Zhang, Y., Qian, Y., Huang, Y., Guo, Y., Zhang, G., & Lu, J. (2017). An entropy-based indicator system for measuring the potential of patents in technological innovation: rejecting moderation. *Scientometrics*, 111, 1925-1946.
- Zhang, B., & Wang, Y. (2021). The effect of green finance on energy sustainable development: a case study in China. *Emerging Markets Finance and Trade*, 57(12), 3435-3454.

- Zhao, X., Ma, X., Chen, B., Shang, Y., & Song, M. (2022). Challenges toward carbon neutrality in China: Strategies and countermeasures. *Resources, Conservation and Recycling*, 176, 105959.
- Zhuang, M., Zhu, W., Huang, L., & Pan, W.-T. (2022). Research of influence mechanism of corporate social responsibility for smart cities on consumers' purchasing intention. *Library Hi Tech*, 40(5), 1147-1158.

How Work from Home can Improve Job Satisfaction of IT Sector Employees? Putting Work Life Balance and Work Enrichment into The Picture

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Abstract

The aim of this paper is to establish a more nuanced understanding of relationship between Work-From-Home (WFH) and Job Satisfaction (JS), by looking at the mediating role of Work-Life-Balance (WLB) and Work Enrichment (WE). The Person-Environment (P-E) fit theory underpins this research, which suggests that occupational factors such as WFH and environmental factors such as WLB and WE, can play an important role in enabling employees to achieve positive outcomes. Primary data were gathered from 352 employees of IT and Telecom sector in Pakistan through an online survey. Instrument reliability and validity was established and hypotheses were tested by performing Structural Equation Modelling (SEM) using SmartPLS 4.0. Our results show that WFH leads to satisfaction when family and work resources are well aligned and complimentary. Implications for IT businesses regarding design of strategies to improve employee outcomes of WFH are discussed.

Keywords: Work from Home, Job Satisfaction, Work Life Balance, Work Enrichment, P-E fit Theory, IT/Telecom Companies, Pakistan.

Introduction

Work-From-Home (WFH) arrangements were adopted extensively during the COVID-19 pandemic lockdowns, and since then this digitally enabled form of work setting is becoming a global norm. For highly competitive, innovation driven IT businesses, besides allowing access to a broader talent pool online, WFH offers travel-related and electricity cost-cutting opportunities. A global talent pool can result in a more diverse workforce and access to specialized skills that may not be locally available (Bloom et al., 2015). By eliminating the need for daily commutes, remote work contributes to a decrease in carbon emissions and environmental pollution. This supports sustainability goals and helps in the fight against climate change (Awais, Saghir, & Niaz, 2024; Hook, Sovacool, & Sorrell, 2020). At the same time, the debate over effectiveness of WFH in post-COVID times is far from settled because organizations are still figuring out appropriate hybrid work designs for boosting productivity while remaining aligned with staff expectations.

For IT employees, WFH may offer several benefits such as online work, flexible working hours and avoidance of daily travel. Yet there are also downsides such as communication difficulty, distractions, isolation, and mental stress. Literature on the impact of WFH on employee outcomes remains ambivalent, with most studies showing a positive impact on Job Satisfaction (JS) and Work-Life-Balance (WLB) (Kowalski et al., 2022; Putra et al., 2020) and some studies showing blurring of work boundaries and difficulty in maintaining WLB (Bloom et al., 2020; Grant et al., 2013; Ugwu et al., 2022).

Striking a balance between work and personal life is particularly relevant for IT sector employees who face the risk of burnout due to intense work demands. Purwanto et al. (2020) argue that working from home can increase productivity through better management of workload and reducing work-life conflict. Employee's value flexibility and trust associated with WFH, resulting in higher morale and retention rates

(Bentley, 2016). Flexible work arrangements empower individuals, especially women, to balance their career goals with family responsibilities, resulting in a more inclusive and diverse workforce (Hill et al., 2008). On the flip side, WFH makes it difficult to separate professional and personal time, leading to longer working hours and work continuing into evening time and off days. WFH arrangements may also cause work intensification, where employees take fewer breaks, perceiving the burden of “always being on”.

Other than WLB, IT sector employees also seek Work Enrichment (WE) as it provides opportunities for learning and growth. Organizations that prioritize WE demonstrate their commitment to employee well-being and development. This is done by designing structures in a way that gives employees more autonomy, responsibility, and opportunities for self-awareness and growth (Liu et al., 2019). Telecommuting can contribute to WE through increased control over work tasks (McNall et al., 2009). At the same time there is lack opportunity of informal learning and mentorship which come along with face-to-face interactions. Nevertheless, it is plausible that WFH culminates in JS indirectly with WLB and WE being the linking instrumentalities. Our paper tests this proposition empirically.

Further, Le et al. (2020) pointed out a dearth of studies on WLB in Asia. Therefore, we have conducted this investigation in Pakistan's IT and Telecom sector. WFH was extensively adopted by the Pakistani telecom companies during the COVID-19 pandemic and remains partially enforced as hybrid work designs are being tried. Pakistan's IT sector has been growing at 20-30% annually and IT exports were \$3.5 billion in 2023. This includes services such as software development, IT-enabled services (ITES), and Business Process Outsourcing (BPO). The IT sector growth is enabling diversification of Pakistan's economy away from overreliance on agriculture and textiles. Pakistan's IT services are highly competitive both in terms of cost and quality, allowing for outsourcing from companies based in the US, Europe, and the Middle East. Most importantly, 60% of the population in Pakistan is below the age of 30. The IT sector provides young Pakistanis opportunities for good jobs, enabling upward social mobility and reducing unemployment. The Government of Pakistan is cognizant of the fact that IT and telecommunications sector acts as key drivers of progress and innovation. Therefore evidence based research to guide policies for further development of this sector is direly needed (SBP, 2023).

Our paper provides a concise review of HR literature related to our study variables, followed by the methodology adopted to collect and analyze empirical data. Paper ends with discussion on findings and implications for the IT sector.

Literature Review

Although studies related to WFH have often used the Job Demands-Resources (JD-R) and Self-Determination Theory (SDT) as underpinning theories, we believe that the Person-Environment (P-E) Fit theory provides the most appropriate theoretical framework for modeling all of our study variables. P-E Fit means that “people have an innate need to adapt to their environment and seek an environment that matches their personal characteristics”. The theory suggests that when there is a good fit between a personal, environmental and occupational factors, employees are more likely to experience positive outcomes (Van Vianen, 2018).

Personal Factors

The theory emphasizes that individuals have unique characteristics such as personality, skills, belief, values and feelings. As long as there is no friction in the interaction of these personal factors within the work environment, employees will feel satisfied (Brown et al., 2005). The outcome variable of our study, i.e. JS can be seen as a personal factor.

Environmental Factors

The work environment also plays a crucial role in establishing good fit for the employee. Factors such as work hours, workload, flexibility, and organizational culture can positively impact an individual's ability

to balance their work and personal life (Allen et al., 2013). The mediating variables in our study, i.e. WLB and WE, can be considered as environmental factors.

Occupational Factors

P-E fit occurs when there is a match or compatibility between the person and the occupational factors (including task characteristics, organizational culture, and available resources). When there is a good fit, individuals are more likely to experience reduced work-family conflict, lower stress levels, and higher life satisfaction (Brown et al., 2005). The independent variable of our study, i.e. WFH can be seen as an occupational factor.

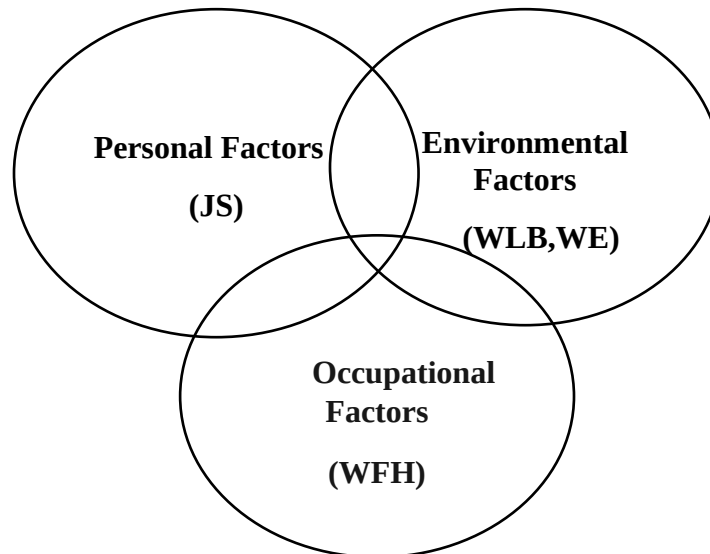


Figure 1: Diagrammatic Representation of P-E Theory

"Work-From-Home" is a structure that allows personnel and work tasks to be shared across settings away from a central place of business or physical, organizational location (Kumar, 2023). WFH became charted territory as a result of the COVID-19 pandemic and stay-at-home orders requiring work to be done online (Baker et al., 2020). Telecommuting or remote working are alternate terminologies for digitally enabled form of WFH.

"Job Satisfaction" is an employee's degree of contentment with working conditions including good supervision, salary and relations with coworkers (Le et al., 2020). A good indicator of the significance of JS in today's businesses is the new management model that emphasizes treating employees as human beings with needs, wants, and personal desires (Chan et al., 2016).

Numerous research findings in different context have shown that WFH has had a positive impact on JS. Bloom et al. (2015) conducted a study in China and discovered evidence suggesting that remote work increased JS among participants. The increased autonomy and flexibility associated with remote work arrangements were identified as key factors contributing to this positive outcome. Similarly, Golden et al, (2008) conducted their study within the United States that emphasized the positive impact of WFH on JS, highlighting reduced stress from commuting and the ability to better integrate work and personal life. Grant et al. (2013) conducted surveys and interviews with remote workers across various industries in New York City explored the psychological factors affecting remote workers' JS, well-being, and WLB. Their findings while warning about effects of fewer work boundaries and difficulty in maintaining quality of home life, supported the idea that remote work arrangements provide individuals with greater control over their work environment and schedules. Collectively, these studies demonstrate the positive impact of WFH on JS.

H1: Work from home positively impacts job satisfaction.

Work is defined as “paid employment”, and life is defined as “activities outside of work.” The meaning of balance is the difference “between fun and serious activities” thus accomplishing fulfilling “work-life balance”. Haar and Brougham (2022) associate WLB with an individual's ability to successfully shuffle their vital responsibilities in general, like work, family, and other numerous jobs in their day-to-day existence. According to Shaikh et al. (2019), the term WLB refers to the achievement of job-related desires that are arranged and shared between the individual and his or her job-related partners in the work and family space. Employees having low WLB will likely have lower work devotion if there is a lack of harmony between their personal and official duties. Le et al. (2020) supported WLB, boundary management, or maintaining clear lines between work and personal life. By allowing employees to have greater control over their work schedules and personal commitments, telecommuting helps lower stress levels and enhances satisfaction with the integration of work and personal life (Golden & Veiga, 2005; Nawaz & Awais, 2018).

H2: Work from home positively impacts Work life balance.

Enrichment is huge and merits thought (Lui et al., 2022). WE is a concept that emphasizes improving the nature of work and further developing representative fulfillment and inspiration drawn from one's job. Carlson et al. (2006) divide the WE concept into two dimensions namely: Work-Family-Enrichment (WFE) and Family-Work-Enrichment (FEW). WFE can be measured along three sub-dimensions (development, affect, and capital). Similarly, FEW is conceptualized as having three sub-dimensions (development, affect, and efficiency). Families can provide resources that lead to workplace productivity gains; and jobs can provide resources for family-based productivity gains (García et al., 2023). As indicated by McNall et al. (2009), enrichment is a cycle by which personal work invigorates professional work. WFE occurs when experiences in the work role improve the quality of family life. This positive interaction can result from skills, perspectives, flexibility, and emotional support gained at work that enhance family interactions and relationships (Greenhaus & Powell, 2006).

H3: Work from home positively impacts Work Enrichment.

McNall et al. (2023) established that employees who can avail flextime and compressed work facilities, experience work to home enrichment, which is also linked to higher job satisfaction. Gašić and Berber (2023) stated that WE through flexible work arrangements can significantly increase employee engagement, mediating the association between these arrangements and reduced turnover intentions. According to an earlier study conducted by Brown et al. (2005), employees who perceive their jobs as offering chances for learning and growth tend to have higher levels of JS. As employees acquire new skills, expand their knowledge, and take on challenging tasks, they experience personal and professional development, which contributes to their overall JS (Brown et al., 2005). A Meta-analyses-based study conducted by Humphrey et al. (2007), discovered a positive correlation between task variety and JS. Employees who have the opportunity to engage in a diverse range of tasks and activities tend to report higher levels of JS compared to those with more repetitive or monotonous job roles (Humphrey et al., 2007). This suggests that FWE which can prepare an individual to handle task variety better, will also lead to JS.

IT workers are challenged with complex problem solving which can be attained through enrichment of their work. WE can potentially enable satisfying and remunerating work insights, noteworthy work fulfillment and expert development for IT sector workers.

H4: Work Enrichment positively impacts Job Satisfaction.

Grzywacz and Bass's (2003) research focused on understanding the dynamics of work, family, and mental health within the context of the American workforce. This research indicates that attaining a favorable WLB has a positive effect on JS. People who can efficiently handle their work and personal duties tend to have higher JS levels compared to those who find it challenging to juggle these areas of their lives. Additionally achieving a positive WLB has been consistently proven by research to have a positive impact

on JS in European countries, where issues related to WLB and employee well-being have been extensively studied (Allen et al., 2000; Grant et al., 2013).

For people working in IT sector there is constant change and uncertainty, therefore WLB maybe essential for reducing stress, enhancing health, increasing productivity, fostering engagement, and cultivating a positive organizational culture, all of which may contribute to IT workers' satisfaction with their jobs.

H5: Work life balance has a positive impact on job satisfaction.

H6: Work Life Balance mediates the relationship between work from home and job satisfaction.

H7: Work enrichment mediates the relationship between work from home and job satisfaction.

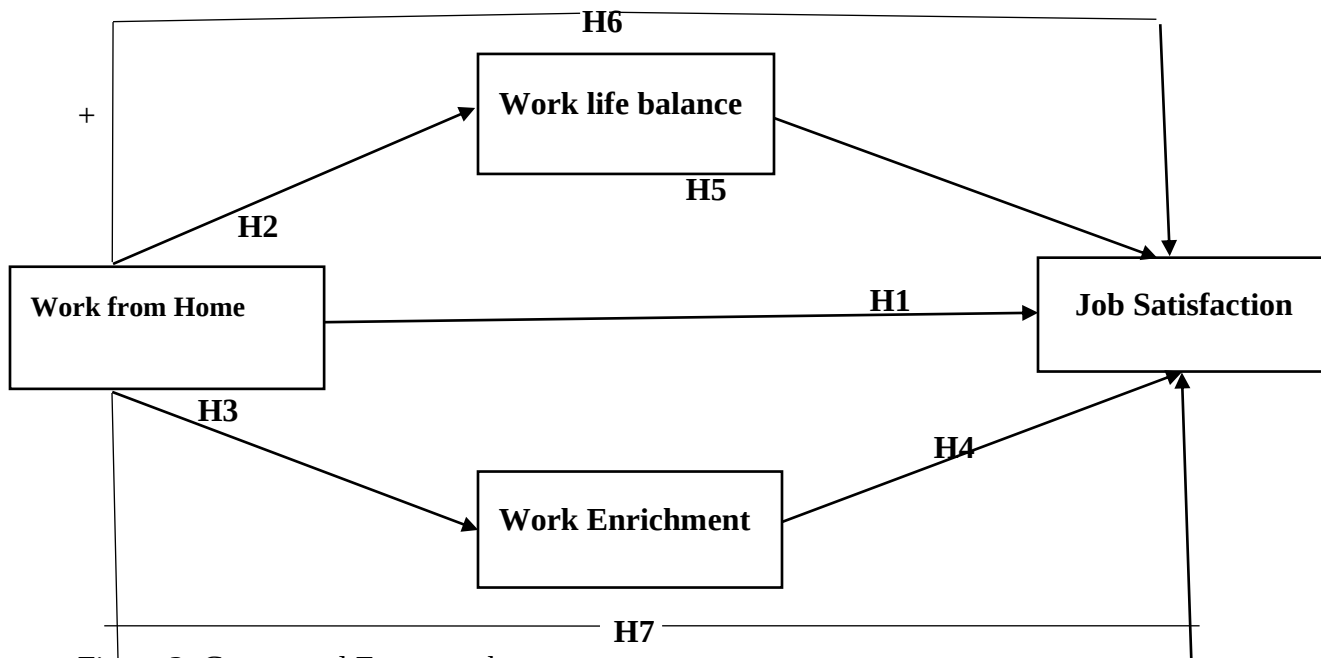


Figure 2: Conceptual Framework

Methodology

The study targeted employees of IT and Telecom sectors (e.g. PTCL, Nayatel, Jazz, Telenor, Zong, PASHA etc.), who have WFH experience. A survey was conducted online using snowball sampling from 352 employees from twin cities of Pakistan (Rawalpindi and Islamabad). The sample size was based on the Item-to-Sample Ratio as suggested by Schwab (1980). The survey questionnaire was divided into two parts. Section 1 included demographic variables (i.e. gender, age, education, and job position) and Section 2 included construct measurement items using 5-point Likert scale. Number and source of items are given in Table 1.

Table 1: Research Instrument

Constructs	No. of items	Source
Work from Home	09	Kowalski et al. (2022)
Job Satisfaction	03	Kowalski et al. (2022)
Work Life Balance	04	Ugwu et al. (2022)
Work Enrichment	18	Carlson et al. (2006)

Data were analyzed through Structural Equation Modelling (SEM) performed using SmartPLS 4 software. Reliability and Validity was checked by using a formative measurement model whereas hypothesis testing was performed by using a structural model.

Results and Findings

Table 2: Sample Demographics

Gender	Male	183	51.9%
	Females	162	46.0%
	Prefer not to say	07	1.93%
Age	<-25	42	11.93%
	26-30	93	26.42%
	31-35	101	28.69%
	36-40	54	15.34%
	40>	62	17.61%
Marital Status	Married	218	61.93%
	Unmarried	134	38.06%
Educational Level	Bachelors	46	13.06%
	Masters	124	35.22%
	MPhil/MS	133	37.78%
	PhD	49	13.92%
Job Position	Entry-Level	118	33.52%
	Middle level	172	48.86%
	Top Management	62	17.61%

Table 2 illustrates a balanced sample in terms of gender (51.9% males, 46.0% females). The age distribution aligns with typical demographics of IT professionals, as many individuals in this field are young. Additionally, the sample reflects a balanced distribution in terms of education levels. Notably, middle-level managers are well-represented (48.86%).

Table 3: Normality of Data Distribution

Items	N	Mini	Maxi	Mean	SD	Skewness	kurtosis
WFH1	352	1	5	2.80	1.380	0.22	-1.20
WFH2	352	1	5	2.84	1.332	0.09	-1.18
WFH3	352	1	5	2.66	1.325	0.32	-1.03
WFH4	352	1	5	2.66	1.382	0.34	-1.12
WFH5	352	1	5	2.79	1.312	0.23	-1.09
WFH6	352	1	5	2.69	1.326	0.18	-1.11
WFH7	352	1	5	2.91	1.321	0.04	-1.16
WFH8	352	1	5	2.92	1.323	0.13	-1.12
WFH9	352	1	5	3.03	1.314	0.08	-1.12
JS1	352	1	5	2.88	1.136	0.13	-1.23
JS2	352	1	5	2.91	1.389	0.08	-1.26
JS3	352	1	5	2.88	1.362	0.16	-1.19
WLB1	352	1	5	2.94	1.378	0.07	-1.20
WLB2	352	1	5	2.77	1.340	0.27	-1.06
WLB3	352	1	5	2.77	1.378	0.28	-1.16
WLB4	352	1	5	2.85	1.409	0.17	-1.25
WE1	352	1	5	2.81	1.387	0.24	-1.18
WE2	352	1	5	2.71	1.410	0.30	-1.21
WE3	352	1	5	2.89	1.395	0.01	-1.29
WE4	352	1	5	2.71	1.332	0.25	-1.08
WE5	352	1	5	2.76	1.346	0.24	-1.13
WE6	352	1	5	2.76	1.347	0.31	-1.12
WE7	352	1	5	2.69	1.374	0.26	-1.13
WE8	352	1	5	2.71	1.389	0.14	-1.23
WE9	352	1	5	2.82	1.380	0.18	-1.23
WE10	352	1	5	2.80	1.391	0.08	-1.23
WE11	352	1	5	2.89	1.329	0.25	-1.13
WE12	352	1	5	2.76	1.346	0.24	-1.13
WE13	352	1	5	2.76	1.347	0.31	-1.11
WE14	352	1	5	2.69	1.374	0.26	-1.12
WE15	352	1	5	2.71	1.389	0.14	-1.13
WE16	352	1	5	2.82	1.380	0.25	-1.23
WE17	352	1	5	2.76	1.346	0.24	-1.13
WE18	352	1	5	2.76	1.347	0.21	-1.12

According to Hair et al. (2017), the ideal range of Skewness and Kurtosis values is between +1 to -1, beyond this acceptable range data cannot be considered normally distributed. As shown in table 3 our data is normally distributed so we can directly apply inferential techniques on it.

We conducted one way ANOVA tests to check for differences in WLB, WE and JS due to Gender and Job Positions. None of the F-values were significant i.e. having significance value less than 0.05.

We checked for Common Method Bias (CMB) in our data by means of Harman's single-factor technique (Podsakoff et al., 2003). As the single largest factor accounted for 39.29 % variance, which is less than the threshold value of 50%, thereby it was confirmed that CMB was not a problem.

Reflective-Reflective Measurement Model

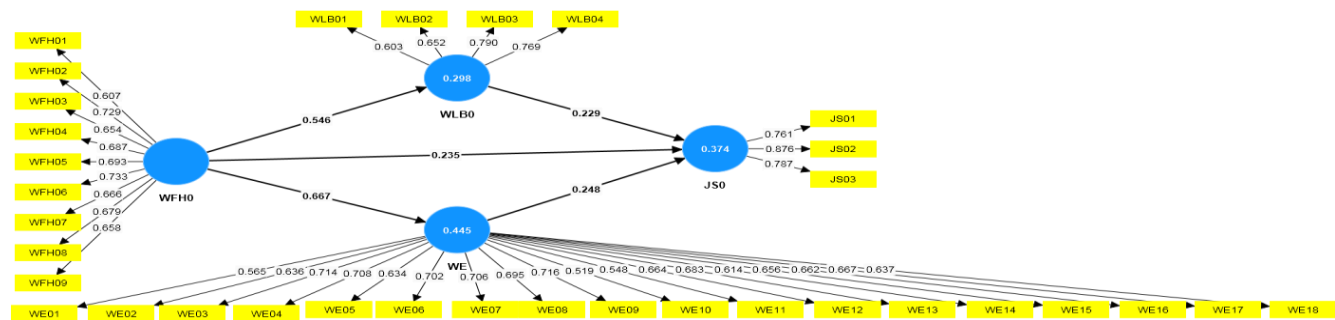


Table 4: Establishing Reliability

Variables	Items	Cronbach's Alpha	CR
WFH	09	0.854	0.856
JS	03	0.736	0.749
WLB	04	0.664	0.679
WE	18	0.920	0.923

According to Hair et al. (2017), a composite reliability scores greater than 0.7 indicates adequate internal consistency. As a general rule of thumb Cronbach's alpha 0.70 and above is good (Garson, 2016; Hair et al., 2011). As shown in table 4 all of our study variables were deemed to be internally consistent.

Table 5: Establishing Convergent validity

Construct and Items	Items Code	Factor Loading	AVE
Work from Home			0.7
<i>I feel that quality of the work I carry out during working from home is better.</i>	WFH1	0.607	
<i>Working from home is personally beneficial for me at work.</i>	WFH2	0.729	
<i>Working from home motivates me to work better.</i>	WFH3	0.654	
<i>I have sufficient technical knowledge in completing work during working from home.</i>	WFH4	0.687	
<i>I have sufficient authority in carrying out work during working from home.</i>	WFH5	0.693	
<i>I have clear work targets when working from home.</i>	WFH6	0.733	
<i>My boss is concerned about my well-being during working from home.</i>	WFH7	0.666	

<i>I received technical assistant from my work place in completing work during working from home.</i>	WFH8	0.679
<i>I can concentrate on getting work done even when there are distraction from family members during work from home.</i>	WFH9	0.658
Job satisfaction		0.5
<i>I am satisfied with my current co-worker.</i>	JS1	0.761
<i>I am satisfied and feel happy with my current boss.</i>	JS2	0.876
<i>I am satisfied with my current salary.</i>	JS3	0.787
Work life balance		0.5
<i>I currently have a good balance between the time I spend at work and the time I have available for non-work activities.</i>	WLB1	0.603
<i>I have no difficulty balancing my work and non-work activities.</i>	WLB2	0.652
<i>I feel that the balance between my work demands and non-work activities is currently about right.</i>	WLB3	0.790
<i>Overall, I believe that my work and non-work life are balanced.</i>	WLB4	0.769
Work Enrichment		0.5
<i>I learn to appreciate different points of view through work, which helps me be a better family member.</i>	WE1	0.565
<i>Due to work I gain knowledge and this helps me being a superior relative</i>	WE2	0.636
<i>Work makes me acquire skills which helps me be a better family member</i>	WE3	0.714
<i>My work puts me in a good mood and this helps me be a better family member</i>	WE4	0.708
<i>Work causes me to feel cheerful and this assists me with being a superior relative</i>	WE5	0.634
<i>I'm happier at work, which helps me be a better family member</i>	WE6	0.702
<i>I'm a better family member and have more personal fulfillment as a result of my work</i>	WE7	0.706
<i>Work gives me a sense of accomplishment which helps me be a superior relative</i>	WE8	0.695
<i>Work provides me with a sense of success and this helps me being a superior relative</i>	WE9	0.716
<i>My family helps me to learn, which makes me a better worker.</i>	WE10	0.519
<i>Family work sharpens my skills and this helps me be a better worker</i>	WE11	0.548
<i>My family encourages me to learn new things, which makes me a better employee</i>	WE12	0.664
<i>Family puts me in a good mood and this helps me be a better worker</i>	WE13	0.683
<i>My family makes me feel happy and this helps me be a better worker</i>	WE14	0.614

<i>I'm always upbeat because of my family, which makes me a better worker</i>	WE15	0.656
<i>I can work efficiently because my family requires me not to waste time at work</i>	WE16	0.662
<i>I am able to be a better worker because my family encourages me to focus my work time</i>	WE17	0.667
<i>Family makes me be more engaged working and this assists me with being a superior worker</i>	WE18	0.637

The ideal requirement for factor loading is ≥ 0.7 , but the minimum acceptable value for factor loading is 0.50 (Bakeman & Gottman, 1986). According to Garson (2016), the minimum requirement for AVE is 0.5. As shown in Table 5, factor loadings and AVE lie in acceptable range which confirms the convergent validity of our study constructs.

Table 6: Establishing Discriminant Validity

HTMT	JS	WE	WFH	WLB
JS				
WE	0.653			
WFH	0.661	0.750		
WLB	0.717	0.760	0.719	

According to Hair et al. (2017) the HTMT value must be less than 0.90 to establish discriminant validity. As shown in Table 6 the values of the HTMT ranged from 0.653 to 0.760 in our sample which is acceptable and therefore it shows that our study constructs are different from each other.

Structural Model

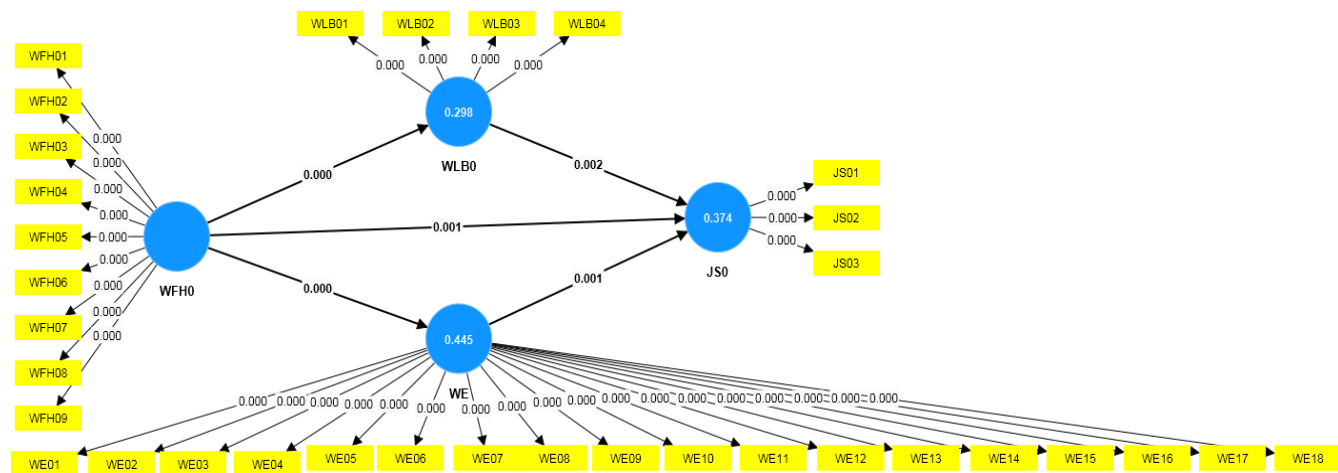


Table 7: Ruling out Multi-collinearity

Inner model List	VIF
WE->JS	2.099
WFH->JS	1.917
WFH->WE	1.000
WFH->WLB	1.000
WLB->JS	1.661

According to Garson (2016) if the variance inflation factor (VIF) values are less than 5, this indicates that there are no difficulties caused by horizontal or vertical collinearity in the model. As shown in Table 7 the values of VIF are in acceptable range.

Table 8: Establishing Goodness of Fit

Construct	R-Square	R- Square Adjusted
JS	0.374	0.369
WE	0.445	0.443
WLB	0.298	0.297

According to Kock (2014) the coefficient of determination (R-Square) represents the goodness of fit of the regression model and also indicates the extent to which the independent variables explain the variability of the dependent variable collectively. The value range of R-Square lies between 0 to 1. Higher values are representative of a good model fit for data. R-Square values are 0.37, 0.45 and 0.3 for JS, WE and WLB respectively establishing that the data we collected fit the model well

Table 9: Establishing Predictive Relevance

Variable	Q-Square
JS	0.266
WE	0.435
WLB	0.287

Q-Square measures a model's capacity to forecast the predicted value of a dependent variable based on a predictor variable (Thompson et al., 2015). Table 9 shows that values of Q-square are higher than the threshold (i.e. > zero) (Hair et al., 2014) which means that our model is useful for prediction about levels of Job Satisfaction.

Table 10: Hypothesis Testing (Direct Paths)

Construct	beta	SD	T-statistic	p-values	Decision
WFH>JS	0.235	0.070	3.354	0.001	H1 Accepted
WFH>WLB	0.546	0.052	10.578	0.000	H2 Accepted
WFH>WE	0.667	0.038	17.614	0.000	H3 Accepted
WE>JS	0.248	0.073	3.371	0.001	H4 Accepted
WLB>JS	0.229	0.074	3.111	0.002	H5 Accepted

Table 10 shows results of path analysis based on the structural model. Here all the direct paths are significant as all p-values are less than 1% and all T-statistics are above 2. Therefore Hypotheses 1 to 5 are accepted.

Table 11: Hypothesis Testing (In Direct Paths)

Construct	Beta	SD	t-statistic	p-values	C-I LL-UL	Decision
WFH-WLB-JS	0.125	0.041	3.090	0.002	0.06 0.25	H6 Accepted
WFH-WE-JS	0.165	0.050	3.331	0.001	0.04 0.20	H7 Accepted

Tables 11 show results of path analysis related to mediation effects. We find that WLB and WE mediate the effect of WFH on JS. Hypotheses 6 and 7 are accepted because within the 95% Confidence Intervals (CI) the Lower Limit and the Upper Limit do not straddle a 0 [LL= 0.06, UL= 0.25] [LL= 0.04, UL=0.20], which according to Preacher and Hayes (2008) is an indication of mediation. As both the direct and indirect effects are significant, this shows partial mediation exists and not complete mediation (Reuben & Kenny, 1986).

Discussion and Implications

In line with most of the research pertaining to our study variables in the past, we have found positive effect of WFH on JS in our sample. Further, we have demonstrated the mechanism through which WFH creates a positive outcome, by considering the mediating impact of WLB and WE. This nuanced understanding of WFH is explained through the lens of the P-E fit theory. While many previous studies on WFH were

based on either the JDR Model (Haar & Brougham, 2022; Wood et al., 2023) or SDT (Schade et al., 2021; Tudu & Singh, 2023) we find that WLB and WE are those environmental considerations which are not clearly explained through these theories. So, in terms of the effectiveness debate and cultural development within the organization brought about by WFH, there was a gap in literature which we addressed.

From an effectiveness perspective, as the nature of work in the information technology sector is very demanding, by providing a more hospitable and fulfilling work environment remote work has the potential to boost employee morale and retention in this sector. The job of IT professionals is highly stressful leading to potential conflicts and stress. However, our research findings imply that IT workers would expect to improve their WLB by working from home, because this arrangement gives them more flexibility, lessens stress, and gives them more time to focus on their personal interests and relationships. In the context of Pakistan's IT and telecom sector, WFH opens new avenues for finding gainful employment without having to leave the country, thereby reducing stress due to unemployment and separation from family.

In terms of developing a collaborative organizational culture which is geared towards innovation and agility, it is needed for survival in the IT and Telecom sector. IT work involves constant learning and adaptation, which explains why WFH leads to WE in this sector. By encouraging experimentation, fostering collaboration, facilitating work-life integration, focusing on meaningful work, and providing access to learning resources, telecommuting can enrich work of telecom workers. For young Pakistanis working in the IT sector, exposure to international clients, enables development of soft skills like communication, negotiation, and time management in addition to technical skills.

The trend towards remote working in the IT industry is likely to continue as technology continues to advance, making it an important aspect of modern employment practices. Our research suggests that balance and empowerment are critical factors which IT employees seek based on which they judge their WFH experience. It is the fit between home and office demands which satisfies a worker and as earlier literature suggests, satisfied workers will be more productive and less likely to quit their jobs. In short, if telecom firms seek to improve output, reduce their turnover and improve the learning potential of their staff, WFH is a useful organizational arrangement.

Limitations and Future Research Directions

Generalizability of our research findings suffers due to nature of our data, which was not longitudinal. Sampling was non-probability. These methodological limitations may be addressed in future research. Further there is need to develop a deeper understanding of the potential negative outcomes of WFH, if a lack of WLB and WE is perceived by the workers. For this purpose, future research can consider factors such as work-life strain and boundary enactment.

References

- Abid, S., & Barech, D. K. (2017). The impact of flexible working hours on the employees' performance. *International Journal of Economics, Commerce and Management*, 5(7), 450-466.
- Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, 16(2), 40-68.
- Allen, T. D., Herst, D. E., Bruck, C. S., & Sutton, M. (2000). Consequences associated with work-to-family conflict: a review and agenda for future research. *Journal of Occupational Health Psychology*, 5(2), 278.
- Allen, T. D., Johnson, R. C., Kiburz, K. M., & Shockley, K. M. (2013). Work-family conflict and flexible work arrangements: Deconstructing flexibility. *Personnel Psychology*, 66(2), 345-376.
- Awais, M., Saghir, R., & Niaz, M. H. (2024). Effect of COVID-19 on the Finances & Supply Chain in the Health Sector: A Case of Pakistan. *Human Nature Journal of Social Sciences*, 5(3), 65-74.
- Bakeman, R., & Gottman, J. M. (1997). *Observing interaction: An Introduction to Sequential Analysis*. Cambridge university press.
- Baker, S. R. (2020). COVID-Induced Economic Uncertainty.

- Bakker, A. B., & Demerouti, E. (2008). Towards a model of work engagement. *Career Development International*, 13(3), 209-223.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.
- Bentley, T. A., Teo, S. T., McLeod, L., Tan, F., Bosua, R., & Gloet, M. (2016). The role of organisational support in teleworker wellbeing: A socio-technical systems approach. *Applied Ergonomics*, 52, 207-215.
- Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 130(1), 165-218.
- Carlson, D. S., Kacmar, K. M., Wayne, J. H., & Grzywacz, J. G. (2006). Measuring the positive side of the work-family interface: Development and validation of a work-family enrichment scale. *Journal of Vocational Behavior*, 68(1), 131–164. <https://doi.org/10.1016/j.jvb.2005.02.002>
- García-Salirrosas, E. E., Rondon-Eusebio, R. F., Geraldo-Campos, L. A., & Acevedo-Duque, Á. (2023). Job Satisfaction in Remote Work: The Role of Positive Spillover from Work to Family and Work–Life Balance. *Behavioral Sciences*, 13(11), 916.
- Garson, G. D. (2016). Partial least squares. Regression and structural equation models.
- Gašić, D., & Berber, N. (2023). The mediating role of employee engagement in the relationship between flexible work arrangements and turnover intentions among highly educated employees in the republic of Serbia. *Behavioral Sciences*, 13(2), 131.
- Golden, T. D., & Veiga, J. F. (2005). The impact of professional isolation on teleworker job performance and turnover intentions: Does time spent teleworking, interacting face-to-face, or having access to communication-enhancing technology matter? *Journal of Applied Psychology*, 90(2), 273–283.
- Golden, T. D., Veiga, J. F., & Dino, R. N. (2008). The impact of professional isolation on teleworker job performance and turnover intentions: does time spent teleworking, interacting face-to-face, or having access to communication-enhancing technology matter? *Journal of Applied Psychology*, 93(6), 1412.
- Grant, C. A., Wallace, L. M., & Spurgeon, P. C. (2013). An exploration of the psychological factors affecting remote e-worker's job effectiveness, well-being and work-life balance. *Employee Relations*, 35(5), 527-546.
- Grzywacz, J. G., & Bass, B. L. (2003). Work, family, and mental health: Testing different models of work-family fit. *Journal of Marriage and Family*, 65(1), 248-261.
- Grzywacz, J. G., & Carlson, D. S. (2007). Conceptualizing work-family balance: Implications for practice and research. *Advances in Developing Human Resources*, 9(4), 455–471.
- Haar, J., & Brougham, D. (2022). Work antecedents and consequences of work-life balance: A two-sample study within New Zealand. *International Journal of Human Resource Management*, 33(4), 784 807. <https://doi.org/10.1080/09585192.2020.1751238>
- Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of Market Research* (pp. 587-632). Cham: Springer International Publishing.
- Hair Jr, J., Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2023). *Advanced Issues in Partial Least Squares Structural Equation Modeling*. saGe publications.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed, a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-152.
- Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, 92(5), 1332.
- Hook, A., Sovacool, B. K., & Sorrell, S. (2020). A systematic review of the energy and climate impacts of teleworking. *Environmental Research Letters*, 15(9), 093003.
- Kock, N. (2014). Advanced mediating effects tests, multi-group analyses, and measurement model assessments in PLS-based SEM. *International Journal of e-Collaboration*, 10(1), 1-13.

- Kowalski, K. B., Aruldoss, A., Gurumurthy, B., & Parayitam, S. (2022). Work-From-Home Productivity and Job Satisfaction: A Double-Layered Moderated Mediation Model. *Sustainability (Switzerland)*, 14(18). <https://doi.org/10.3390/su141811179>
- Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences OF INDIVIDUALS'FIT at work: A meta-analysis OF person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology*, 58(2), 281-342.
- Kumar, A. (2023). A Literature Review on Work from Home and Job Satisfaction Under the Mediating Effects of Work-Life Balance. *Pacific Business Review*, 15(11), 21–27.
- Landivar, L. C., Ruppanner, L., Scarborough, W. J., & Collins, C. (2020). Early signs indicate that COVID-19 is exacerbating gender inequality in the labor force. *Socius*, 6, 2378023120947997.
- Le, H., Newman, A., Menzies, J., Zheng, C., & Fermelis, J. (2020). Work–life balance in Asia: A systematic review. *Human Resource Management Review*, 30(4), 100766.
- Liu, P., Wang, X., Li, A., & Zhou, L. (2019). Predicting work–family balance: a new perspective on person–environment fit. *Frontiers in Psychology*, 10, 1804.
- Lui, S. S., Ng, H., & Lo, F. L. (2022). Work enrichment: Enhancing job satisfaction and motivation. *Journal of Organizational Behavior*, 43(2), 235-256. DOI: 10.1002/job.2567.
- McNall, L. A., Masuda, A. D., & Nicklin, J. M. (2009). Flexible work arrangements, job satisfaction, and turnover intentions: The mediating role of work-to-family enrichment. *Journal of Psychology: Interdisciplinary and Applied*, 144(1), 61–81. <https://doi.org/10.1080/00223980903356073>
- McNall, L. A., Masuda, A. D., & Nicklin, J. M. (2023). Flexible Work Arrangements, Job Satisfaction, and Turnover Intentions: The Mediating Role of Work Enrichment. *Journal of Applied Psychology*, 108(4), 732-745.
- Nawaz, K., & Awais, M. (2018). Family Work Conflict and Job Satisfaction: A Study of Banking Sector in Pakistan. *Foundation University Journal of Business & Economics*, 3(1), 29-41.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 88(5), 879
- Powell, G. N., & Greenhaus, J. H. (2006). Is the opposite of positive negative? Untangling the complex relationship between work-family enrichment and conflict. *Career development International*, 11(7), 650-659.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891.
- Purwanto, A., Asbari, M., Fahlevi, M., Mufid, A., Agistiawati, E., Cahyono, Y., & Suryani, P. (2020). Impact of work from home (WFH) on Indonesian teachers' performance during the Covid-19 pandemic: An exploratory study. *International Journal of Advanced Science and Technology*, 29(5), 6235-6244.
- Putra, K. C., Pratama, T. A., Linggautama, R. A., & Prasetyaningtyas, S. W. (2020). The impact of flexible working hours, remote working, and work life balance to employee satisfaction in banking industry during covid-19 pandemic period. *Journal of Business and Management Review*, 1(5), 341-353.
- DP, S. (1980). Construct validity in organizational behavior. *Res Organ Behav*, 2, 3-43.
- Schade, H. M., Digutsch, J., Kleinsorge, T., & Fan, Y. (2021). Having to work from home: Basic needs, well-being, and motivation. *International Journal of Environmental Research and Public Health*, 18(10), 5149.
- Shaikh, S. S., Shah, S. A. S., Katpar, N. K., & Shah, S. K. B. (2019). Factors affecting work-life balance of women working in NGOs of Pakistan. *The Women-Annual Research Journal of Gender Studies*, 11(11).
- Stat Bank of Pakistan (SBP) (2023), half year report, <https://www.sbp.org.pk/reports/half/arFY23/SpecialSection.pdf>
- Tudu, B., & Singh, S. (2023). Conceptualizing the moderating effects between work from home and individual performance–developing a conceptual framework using the self-determination theory. *Current Psychology*, 42(33), 29149-29160.

- Ugwu, F. O., Enwereuzor, I. K., & Mazei, J. (2023). Is working from home a blessing or a burden? Home demands as a mediator of the relationship between work engagement and work-life balance. *Applied Research in Quality of Life*, 18(1), 341-364.
- Van Vianen, A. E. (2018). Person–environment fit: A review of its basic tenets. *Annual Review of Organizational Psychology and Organizational Behavior*, 5(1), 75-101.
- Wood, S., Michaelides, G., Inceoglu, I., Niven, K., Kelleher, A., Hurren, E., & Daniels, K. (2023). Satisfaction with one's job and working at home in the COVID-19 pandemic: A two-wave study. *Applied Psychology*, 72(4), 1409-1429.

Understanding Stakeholder Perspective on Multi-Modal Route Optimization Through New Border Crossing Point of Kharlachi on The Central Asian Regional Economic Cooperation (Carec) Corridor

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Abstract

Pakistan's major border land ports of Torkham and Chaman are located on the CAREC (Central Asia Regional Economic Cooperation) corridor and currently handle the transit trade under the 11-member CAREC Cross-Border Trade Facilitation Agreement and the bilateral Afghanistan-Pakistan Transit Trade Agreement to which Pakistan is a signatory. Both Torkham and Chaman face periodic supply chain disruptions and cargo traffic congestions on the CAREC Corridor. The present research therefore intends to understand stakeholders' perspective to choose an alternate trade route at the Pakistan-Afghanistan border. Qualitative method was used through survey questionnaire to identify the critical factors of port competitiveness related to port infrastructure, regulatory frameworks, port costs, and port location for such interventions at Kharlachi BCP. A sample of 15 well-experienced respondents from the domains of supply chain management, logistics, trade and public sector were selected. The study affirmed that Kharlachi Border Crossing Point (BCP) located at the Pak-Afghan border having prospective multi-modal facilities is best suited to help distribute the prospective CAREC transit cargo load by rail and road transportation to overcome such disruptions. The multi-modal facility is also expected to reduce transportation costs and time. However, being in a primitive state, Kharlachi BCP requires critical development intervention to make itself regionally competitive among other BCPs to attract and manage the national trade flow.

Keywords: Port Competitiveness, CAREC, Land Ports, Border Crossing Points, Port Infrastructure, Port Governance, Transit Trade, Route optimization.

Introduction

For cargo clearance, a Border Land Port (BLP) or a Border Crossing Point (BCP) facilitates clearance of imports, exports, and cross-border transit trade, and cross-border movement of passengers through their profiling and immigration. Both BCPs and BLPs are alternatively used and have become pivotal areas for cross-border land trade and passenger facilitation in the contemporary development landscape (Li et al., 2021). Border Land Ports are especially beneficial when cross border fostering of trade is a priority in which physical distance creates the greatest obstacles of interaction.

Port Competitiveness is a recently emerged phenomenon under research that derives its roots from strategic management practices adopted to increase port performance (Dang et al., 2017; Koliouis et al., 2018; Li et al., 2021; Stavroulakis et al., 2020). Port competitiveness is the degree to which a port competes with another

port in a region based on its performance and strategic interdependence among firms, terminal operators, and external authorities that regulate supply chains (Chang & Talley, 2019; Hidalgo-Gallego, 2021).

The Central Asian Regional Economic Cooperation (CAREC) Program aims to facilitate cross-border trade and transportation among eleven member states, including Afghanistan, Azerbaijan, China, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. (CAREC Integrated Trade Agenda-2030, 2020; CAREC Transport Strategy-2030, 2013; Xie et al., 2015). Eight members of the CAREC Trade Facilitation Agreement are also signatories of the ten-member Economic Cooperation Organization (ECO).

Pakistan aims to improve regional connectivity on the CAREC Corridor by developing Border Crossing Points at the Pak-Afghan border (Kim et al., 2022). The strategic importance of border land ports of Torkham and Chaman located at Pakistan-Afghanistan border is manifested by their facilitation in clearance of 1200 cargo consignments each. Apart from these border land ports, Kharlachi and Ghulam Khan Khel and Angoor Adda are other small BCPs which have been traditional routes to handle cross-border bilateral trade and passenger movement to a lesser extent between Pakistan and Afghanistan. Kharlachi and Ghulam Khan Khel are operational whereas Angoor Adda is currently closed since 2017.

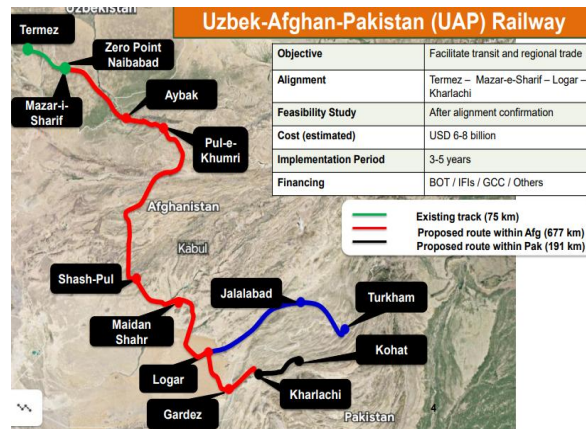
The Pakistan-Afghanistan border which is the main trade link between central and south Asia is often strained by political instability, geographical upheavals and infrastructural deficiencies which interfere with the sound flow of a supply chain existing in the CAREC region. BCPs such as Torkham and Chaman usually face traffic congestion due to high volume of the cargo being handled there and their susceptibility to disruptions. Severe supply chain disruptions enroute to Torkham and Chaman have been occurring until recently due to local unrest or floods which tend to choke the huge CAREC transit trade flow. Kharlachi has a rail link between Pakistan and Afghanistan in addition to road transport network. Its multi-modal nature therefore distinguishes itself as a strategic capability in terms of facilities available within other BCPs in the region. The CAREC trade flow can also be facilitated for all weather long-haul transit through Kharlachi BCP.

Initiating development in Kharlachi to become a fully functional multi-modal facility based of road and rail routes therefore needs to be prioritized towards resolving the existing infrastructural deficiencies along the CAREC Corridor as it constitutes part of Pakistan's wider trade enhancement strategy. Studies indicate that Multi-modal transport systems are effective in improving the flexibility, efficiency and responsiveness of supply chains, especially in high-risk areas. Integrating road activities along with Railways makes Kharlachi offer seamless transfer of cargo and assorted transit options that may enhance supply chain flow when other routes become unfavorable. This initiative is also in line with the CAREC's mission of enhancing economic resilience of its member states through building infrastructure that is robust enough to recover from shocks and promote sustainable trade routes that are competitive among the member countries.

Physical infrastructure development of Kharlachi BCP expects to provide an alternate long-haul multi-modal route for transit goods by diversion of cargo load from the congested nodes of Torkham and Chaman BCPs in case of any supply chain disruptions and its multi-modal distribution from Kharlachi. In enhancing Kharlachi's capacity and operational efficiency, Pakistan will not only enhance its trade routes but also develop more robust supply chain network in the CAREC region. The findings will offer strategic insights for policymakers seeking to strengthen Pakistan's connectivity and economic ties with its neighbors, bolstering the CAREC Corridor's role as a dependable artery for cross-border trade in Central Asia.

This paper therefore aims to address the shortcomings of Kharlachi BCP by identifying the most critical factors of port competitiveness which need to be incorporated into its development plan by the policy makers for enhancing its port efficiency for cross-border trade facilitation in the CAREC region.

Figure-1: Uzbek-Afghan-Pakistan (UAP) Railway Network across Kharlachi BCP



Literature Review

The Port Competitiveness refers to the state of rivalry that ports of different countries in a geographical region develop based on port efficiency and transportation network and resultantly opt for strategic options to achieve a comparative advantage over each other to attract the supply chains (Bhatti, 2024; Hanaoka et al., 2021; Wei & Dong, 2019). In this case, the port must have some capacity in order to participate in the regional competition and eventually become the competitor of another (or other) port. If a port has such a capacity, it is considered a "competitive port". An efficient port may therefore be regionally more competitive (Ayesu et al., 2023).

Though the technical requirements of ports, aimed at bringing operational efficiency, remain standard owing to WCO Framework and OECD Port Cities Program, the competitiveness of land ports is influenced by institutional and operational requirements specific to the regions (Bhatti, 2024; Miraj et al., 2020). In terms of price competition, the main purpose of comparison will be the cargo handling cost and port fees per TEU. Therefore, the port's proximity to major markets and transportation can play an important role in competitiveness, as the chosen location reduces delivery times and costs (Brooks et al., 2017; Parola et al., 2018).

Port efficiency refers to the capability of logistics providers and Government agencies in terms of shipment processing offered through value-added services by the available infrastructure and logistics superstructures (Beresford et al., 2012; Bichou & Gray, 2004; Hanjra et al., 2017; Le-Griffin et al., 2006; Sanchez et al., 2003; Tongzon, 2009; Yeo & Song, 2003). Additionally, port efficiency is measured by the total amount of time required to handle products, the port's consistency, and the capacity to supply substitute options (Vandyck et al., 2015).

Trade facilitation is defined by Gichuhi (2021); Koopman et al. (2020); and Yeo and Deng (2020) as the ease of port and logistical operations. Trade Facilitation's operational measures include the provision of automation enablement layer for paperless trade, digital infrastructure, digital usage, and digital security, the introduction of new supply chain des, signs and development of optimal physical infrastructure and logistics supra-structure at ports to reduce cargo dwell time (Batista, 2012; Hassan et al., 2021; Ismail, 2020). Trade facilitation usually derives its strength from the regulatory interface created between government entities and traders and global value chains at national borders (Kano et al., 2020).

Trade harmonization complements trade facilitation through simplification, modernization and mutual adaptation of export, import and transit processes, and reconciliation of trade documentation (Kormych, 2018). Trade harmonization is achieved by effective cooperation among the Customs administrations and other appropriate authorities on Customs compliance issues for standardization of mutually acceptable trade documents for compatibility in view of the international agreements on Customs cooperation, especially the Trade Facilitation Agreement (TFA) of the WTO (Ortiqov, 2023).

Cargo tonnage measured in Tons Equivalent Units (TEUs) or number of cargo vehicles carrying TEUs is the most fundamental measure of the port throughput. Cargo tonnage at a land port includes the weight of non-

containerized, containerized or Over-Dimensional Cargo (ODC) carried by trucks, open-bed prime-movers, or railway boggy carrying dry bulk and liquid bulk cargo as Over-Dimensional Cargo (ODC) (De Langen & Van Meijeren, 2012; Talley, 2011). The Land Port Dwell Time refers to the amount of time that a cargo spends at a land port before being transported to its final destination by the consignee or its agent after all formalities regarding permits, Customs procedures, and other clearances (Bhatti, & Hanjra, 2019; Gao et al., 2018).

Supply chain disruptions include physical threats like sit-ins and public agitations to stop cargo movement to ports or to kidnap the consignments by armed miscreants, enroute piracy and pilferage of cargo, smuggling, tampering of container seals, and sabotage of port and transportation infrastructure (Altemöller, 2011; Moteff et al., 2002; Nguyen & Wang, 2018; Tukamuhabwa et al., 2017). Cyber-attacks on supply chain information systems communicating with the terminal operating systems of the port operators and port authorities may lead to cargo traffic congestions at the port entry (Alcaide et al., 2020; Urciuoli et al., 2013). Inadvertent or deliberate negligence in the handling of Hazardous Materials (HazMats) can have severe consequences, including loss of life, property damage, environmental pollution, and economic disruptions (Stecke & Kumar, 2009). Manners-Bell (2017) discusses designing supply chains that are resilient to disruptions.

Route optimization is the process of determining the most cost-effective trade route to a port or a destination (Shahriar & Hasnat, 2021). Route optimization is the phenomenon of choosing an alternate route on a trade corridor to mitigate the risk of a supply chain disruption or ensuring delivery of time-critical perishable goods in a time-varying scenario (Qureshi et al., 2013; Ramazanov, 2024). As travel cost increase further and further, route optimization also get further imperative Route choice behavior depends on many parameters but mostly on travel time, traffic safety, intervals, fuel cost, traffic signs, traffic jam and queuing, road type, landscape, road constructions, carbon emission and habitual effects (Alvind et al., 2008; Bhatti, 2024; Khan et al., 2024; Zakir et al., 2024; 2022). Route optimization, powered by real-time data, advanced algorithms and GIS-Gravity models, is essential for building resilient supply chains that can adapt to disruptions and minimize their impact (Khan et al., 2024). The influence of time-varying factors on the traveling speed of vehicles in the transportation network is considered in the route selection of a cold chain container during multimodal transportation, and the traveling speed of cars, trains and ships is analyzed in a geographical terrain with certain political conditions. Significant research indicates that diversifying suppliers, production sites, and logistical routes can reduce the risks associated with localized interruptions (Saidahrolovich & Numonzhonovich, 2023). Proactive risk management for route optimization requires enhanced visibility, predictive analytics, and operational efficiency, which may be achieved by integrating technologies like AI, IoT, blockchain, and cloud computing (Karanam et al., 2024).

Introduction of multi-modal facilities for carrying goods to long distances with reduced costs has attracted researchers to focus on advanced algorithms and data analysis to determine the most cost-effective combination of transport modes (truck, rail, ship, etc.) for a given route, considering factors like distance, fuel costs, infrastructure availability, and cargo type (Hu et al., 2018; Vinokurov et al., 2022). Development of multimodal connectivity has been identified by Van Klink and Van den Berg (1998) and later reinforced by Roberson et al. (2015) who argue that the area of interest of traders need to be expanded beyond the conventional road transport networks for reduction in port costs during long haul by using rail network. Cargo handling efficiency at a border land port can thus vary based on several factors, including the infrastructure, technology, equipment, management practices, the volume of cargo being processed, and the availability of multi-modal transportation facilities designed to help transfer of cargo among trucks, trains, and ships time (ESCAP, 2022). Multimodal transport can reduce emissions compared to relying solely on trucks, especially for long hauls (Pålsson et al., 2017). Improving intermodal connectivity for goods transfers has led to effectively handle the time and expense of transferring cargo by a goods transporter between various modes to choose the shortest possible route to save time and cost (De Langen et al., 2013; Gao et al., 2024). Developing standardized containers, intermodal terminals and cargo loading systems by the logistics industry tends to streamline goods transfer and reduces handling costs as efficient terminals with adequate capacity and technology can significantly speed up transfers (Nekhoroshkov et al., 2022; Tian et al., 2024).

The Central Asian Regional Economic Cooperation (CAREC) Program aims to facilitate cross-border trade and transportation among eleven member states, including Afghanistan, Azerbaijan, China, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan (CAREC Integrated Trade Agenda-2030, 2020). The program focuses on facilitating transit trade, enforcing simplified regulations, automating Customs procedures, adopting standard international codes, improving infrastructure, and implementing risk-management systems (CAREC Transport Strategy-2030, 2019; Xie et al., 2015). The Central Asian region is the least integrated within itself and with its neighboring states in terms of border-crossing services offered for cargo and passengers, and any further improvement therein tends to decrease international transportation costs, border crossing time (Abdullayev, 2022; George, 2012; ADB, 2013a; Sadozai & Blondin, 2023; Samad & Abbas, 2021; Tanabe et al., 2015; Verskun et al, 2023). Border land ports, if well-developed, are expected to play a crucial role in facilitating international trade and connectivity, particularly in landlocked regions such as those associated with the Central Asia Regional Economic Cooperation Program (CAREC Integrated Trade Agenda-2030, 2020).

Kharlachi BCP is located in Kurram District, KPK province. In 2005, the Federal Government issued a notification declaring Kharlachi as a Customs Station. The fencing upon Pak-Afghan bilateral, both, undeclared and declared, trade via land routes, connecting District Kurram with vilayat (province) of Paktia, Ningahar and Khost of Afghanistan, has forced all cargo traffic and passenger movement to divert to Kharlachi for legal clearance in the area. Customs operations remained suspended from 2008 to 2012 due to sectarian clashes. Military operations in erstwhile FATA also adversely affected trade and economic activity in the area from 2014 to 2018. In 2018, NLC took over the border trade operations, and facilities and infrastructure were improved to some extent. Currently, there is a railway line passing through the area that connect to the Afghan side. Currently, NLC is responsible for terminal operations, and Customs for checking of goods and collection of duties and taxes. Security is looked after by the Army and Frontier Corps. Kharlachi is the only legal border crossing in the Kurram District and is about 19 kms from Parachinar. The Kurram River passes near the BCP facility which is the main source of water in the area and most of agriculture depends on river water. Presently there is huge import activity of coal from Afghanistan (Amin, 2023; Bhatti, 2024; Khan, 2017).

This study considers the Stakeholder Theory as its base theory to address the research problem of exploring an alternate and draws inference from the Resource Based Theory as well for port development. Ian Mitroff (1983) first postulated this theory as the ‘Stakeholders of the Organizational Mind’ (Hirschhorn, 1984). The Stakeholder Theory looks at port competitiveness to explore the relationship between a principal and an agent which may be cooperative but may have different stakes and attitudes toward risks impacting port performance and their mitigation measures. Stakeholder theory (ST) is a theory of business ethics and organizational management (Schaltegger et al., 2019). According to the Stakeholder Theory, organizations aim to generate multiple benefits for different stakeholders (i.e., groups and individuals who can affect or be affected by the organization - e.g., civil societies, communities, customers, employees, governments, shareholders, suppliers) (Barney, 2018; Freeman et al., 2021). The study of interagency coordination and capacity of personnel at ports may also be guided by the Stakeholder Theory (Widdowson et al., 2018).

The Resource Base Theory postulates that organizations and industries endowed with abundant resources and distinctive capabilities are better equipped to withstand creative destruction. An enterprise is regarded as a collection of specific resources, and the heterogeneity of resources gives the enterprise its unique characteristics which become the source of its competitive advantage towards performance improvement (Aydiner et al., 2019). These basic ideas led to the development of the Resource-Based View (RBV) whereby RBV replaces ‘products’ with ‘resources; and considers that enterprises are a unique combination of tangible and intangible resources rather than product marketing activities. Resource-Based View (RBV) aims to develop physical infrastructure and professional capacity to help maximize throughput and increase customer-centric volume competitiveness associated with the ability of port operations to reduce dwell time. Consequently, the amount of port operational efficiency, reliability, and cargo handling charges all have an impact on port competitiveness (Bhatti & Hanjra, 2019; Cho, 2014; Li, 2017).

Research Method

The literature Review revealed that although the assessment of factors for choosing a suitable port by relevant stakeholders is nothing new, yet there is a dearth of discussion among the scholars on the determination of critical factors directly required for development of border land ports along the CAREC Corridor. This research is exploratory, descriptive, and explanatory in terms of its outcomes, however, due to uniqueness of the topic, especially in context to Pakistan, the Study is primarily exploratory. It adopted a mixed-method approach through collection of primary and secondary data and analysis of the same.

In a mixed-method approach, the qualitative technique incorporates the participant's subjective experience to bolster the credibility of the findings, while the quantitative method uses structured questionnaires to generalize the information (Kajornboon, 2005; Tavakol & Sandars, 2014). To make findings of the Study applicable at multiple levels of policy formulation and implementation, the responses were taken from a diverse sample of respondents. Qualitative data was therefore acquired through semi-structured interviews and open and closed-ended questionnaires. Through the semi-structured interviews, the respondents were prompted to express their own views and opinions on each question posed.

This allowed extraction of answers to critical questions and an in-depth investigation of activities linked to facets of operational efficiency, port infrastructure, business process digitization, trade harmonization among CAREC signatories, multi-modal transportation, port costs, port location and port governance. The research also used official statistical data on cargo flow at land ports, which was derived from larger samples for generalization. The quantitative data was obtained from various sources including trade facilitation agencies (Pakistan Customs, Federal Investigation Agency and Ministry of Commerce etc.), terminal operators (National Logistic Corporation and Pakistan Railway etc.), freight forwarders, clearinghouses, shipping lines, importers and exporters, and the Federal and Provincial Chambers of Commerce and Industry.

Research Participants

A total of 15 stakeholders were initially interviewed related to port management and trade facilitation for location-specific border land ports. Stakeholders who were interviewed were also provided survey questionnaires to fill as respondents. All 15 stakeholders returned the questionnaire filled w.r.t various aspects of cross-border trade and passenger facilitation. The Survey was conducted to uncover the factors within the two dimensions (operational competitiveness based on cargo volume etc., and investment competitiveness based on port governance etc.) because of the subjective experience-based responses of participants. Their opinions formed the basis of extraction of criteria for prioritizing the factors of competitiveness.

Sr	Area of Relevance	Education	Experience	Gender	Remarks
1.	Importer/Exporter	B.A.	21	Male	Coal Importer
2.	Clearing Agent	B.A.	14	Male	Clearing House & Logistics
3.	Chamber of Commerce	B.A.	18	Male	Provincial Office Bearer
4.	Banker	MBA	14	Male	Investment Portfolio
5.	Transporter	Matric	15	Male	Open Truck
6.	Customs Official	M.A.	10	Female	Appraisalment
7.	PSW Official	M.A.	11	Male	IT Management
8.	Immigration Official	M.A.	10	Male	NADRA Project
9.	Plant Protection Official	B.Sc.	16	Male	DPP
10.	Terminal Operator Official	M.A.	14	Male	Border Terminal Operations
11.	Frontier Corps Official	B.A.	16	Male	Commandant

Table-3.1: Respondents' Profile

Sr	Area of Relevance	Education	Experience	Gender	Remarks
12.	Pakistan Railways	M.Sc.	12	Male	Rail-Cop
13.	Ministry of Commerce	M.A.	12	Female	WTO Desk
14.	Ministry of Communications	MBA	14	Male	JS-II Technical
15	Transportation Facilitation Consultant	BSc Civil Engineering	26	Male	UNESCAP-SSWA
16	Pakistan Railways	M.Sc.	12	Male	Railcop
17	Pakistan Railways	M.A.	09	Male	Railway Operations
18	Pakistan Railways	B.A.	11	Male	Land Record
19	Pakistan Railways	B.A.	13	Male	Infrastructure Development
20	Customs Advisor	M.B.A.	30	Male	Legal Consultant
21	Pakistan Engineering Council (PEC)	B.Sc.Engg	14	Male	Infrastructure & Contract Management
22	Port Equipment Vendor	B.B.A.	18	Male	Scanners/Weighbridges
23	Port Equipment Vendor	M.Sc.	17	Male	e-Gates/ Data Centers
24	Frontier Corps Official	B.A.	16	Male	Commandant
25	Infrastructure Consultant	MBA	22	Male	Donor Agency

Data Collection and Analysis

Face-to-face in-depth interviews were conducted with the respondents who were the primary stakeholders in CAREC cross-border trade facilitation and operationalization from Kharlachi BCP like Pakistan Customs, PSW, Immigration, Plant Protection Department, Border Terminal Operator (BTO) and the Frontier Constabulary. The other key respondents included officials from the ministries of Railways, Commerce, and Communications for policy input. Interviews were also conducted from a prominent clearing house, logistics provider and freight forwarded. To get feedback from the international forum of UNESCAP for Customs digital transformation and road transport network development in the CAREC region was also obtained. Interviews approximately lasted between 30 and 45 minutes. Subsequent to sharing the trade flow data at Kharlachi and other Pakistani BCPs, with the respondents, they were subjected to key questions and probing questions, as well as throw-away questions within the semi-structured survey format. All the responses were later transcribed to code the data for scaling down to meaningful themes as stressed by Bhatti et al. (2016); Miles and Huberman (1994). In addition, the respondents were encouraged to freely express their opinion on the issue.

Findings and Discussions

This section shows the findings reported in view of the research objective in the exploratory study. The following themes were extracted from the interviews:

Theme 1: CAREC Corridor and its Significance to Pakistan

In giving their viewpoint about the Central Asia Regional Economic Cooperation (CAREC) Program, *Respondents 1, 3, 6, 13 and 15* affirmed that CAREC is the new vision for regional connectivity and economic empowerment of the people in the area. The signatories of the CAREC Cross-border trade Facilitation Agreement intend to link their landlocked hinterland to the deep seaports in the Arabian sea as well as to ensure that trade links with South and South-East Asia and Africa are established. *Respondents 14 apprised* that from 2001 to December 2023, CAREC investments reached almost \$51 billion spanning around 276 regional projects. Of the total, ADB financed more than USD 17.6 billion, USD 23.4 billion by other development partners, and USD 10 billion by the CAREC governments. He further informed that Pakistan has invested around USD 2.4 Billion in the CAREC Program in various project streams and tranches

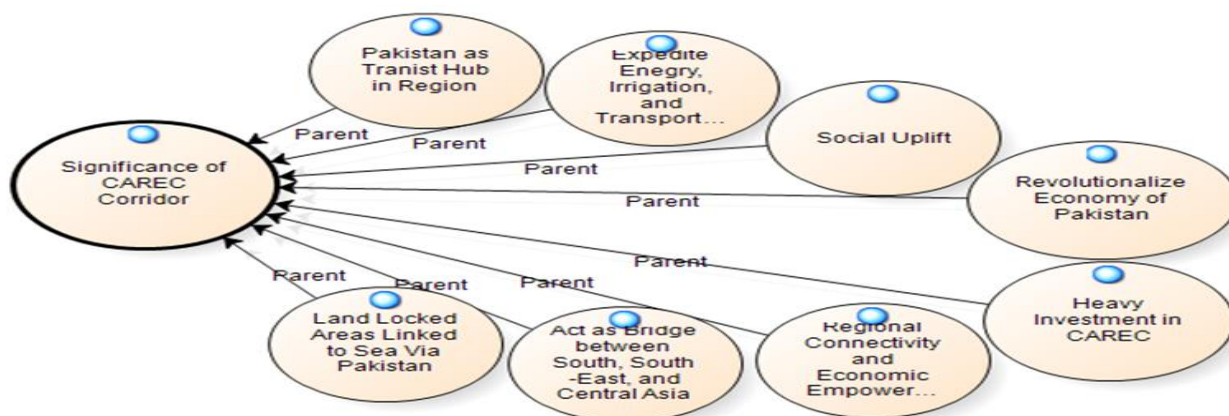
which amounts to 4.6% of the overall investment. Respondents 7 and 15 avowed that the CAREC was likely to revolutionize Pakistan's overall economic condition and improve the lives of millions of people across the region. Respondents 3, 4, 6, and 7 were of the view that CAREC would further strengthen the ties among its eleven signatories through an effective trade corridor. Respondent 5 expected the CAREC Corridor to act as a bridge between South & South-East Asia and Central Asia., hence, rendering Pakistan a transit hub in the region. All respondents were of the view that development of the CAREC Corridor would be much beneficial in terms of the socio-economic uplift of the local populace, infrastructure development of its BCPs, and for the regional trade in general, thus benefitting Pakistan. Respondents 6, 7, 12, 13, 14 and 25 added that the imminent energy, irrigation and transport projects announced as part of the CAREC Agreement would also overcome Pakistan's needs in these sectors. Figure-1 depicts the code/node map of Theme-1.

Proposition

Optimal utilization of the CAREC Corridor would significantly ameliorate the overall economic condition of Pakistan by making it a regional transit hub, besides initiating the social uplift of the populace living near the border areas.

Figure-1

Code/Node Map – Theme-1 (CAREC Corridor and its significance to Pakistan)



Theme 2: Contribution Of CAREC Investments in Infrastructure and Services for Regional Port Competitiveness

All respondents were of the view that adequate port infrastructure consisting of Customs Control Zone (CCZ) having import, export and transit trade yards, cargo handling equipment, help in provision of value-added services at all Pakistani BCPs which would lead to enhanced operational efficiency, and would therefore attract and facilitate more CAREC transit trade flow. Respondents 1,2, 3 and 15 proposed that round-the-clock value-added services if made available at Kharlachi BCP, may further reduce transit time of the CAREC cargo to the seaports of Gawadar and Karachi. They were of the staunch view that this would help in meeting export deadlines. Respondents 1, 2, 4, 22 and 23 further opined that the customized cargo scanning and handling equipment at Kharlachi would expedite cargo clearance of the main commodities like fresh fruit by providing temperature-controlled warehouses, and building a dedicated open examination shed for the mineral and bituminous coal would mitigate the risk of their accidental ignition. Respondent 10 stated that leveraging technology for efficiency may help real-time cargo tracking and providing visibility regarding the cargo whereabouts to the Border Terminal Operators (BTOs) of Pakistani BCPs for better coordination and reduces delays. He hoped that through the BTO's Terminal Operating System (TOS) duly integrated with Pakistan Single Window (PSW) and other regional TOS and Single windows. They were of the view that this would help the BTO to get the cargo load distributed in advance to less congested BCPs. Respondents 7 & 8 emphasized that the availability of digital

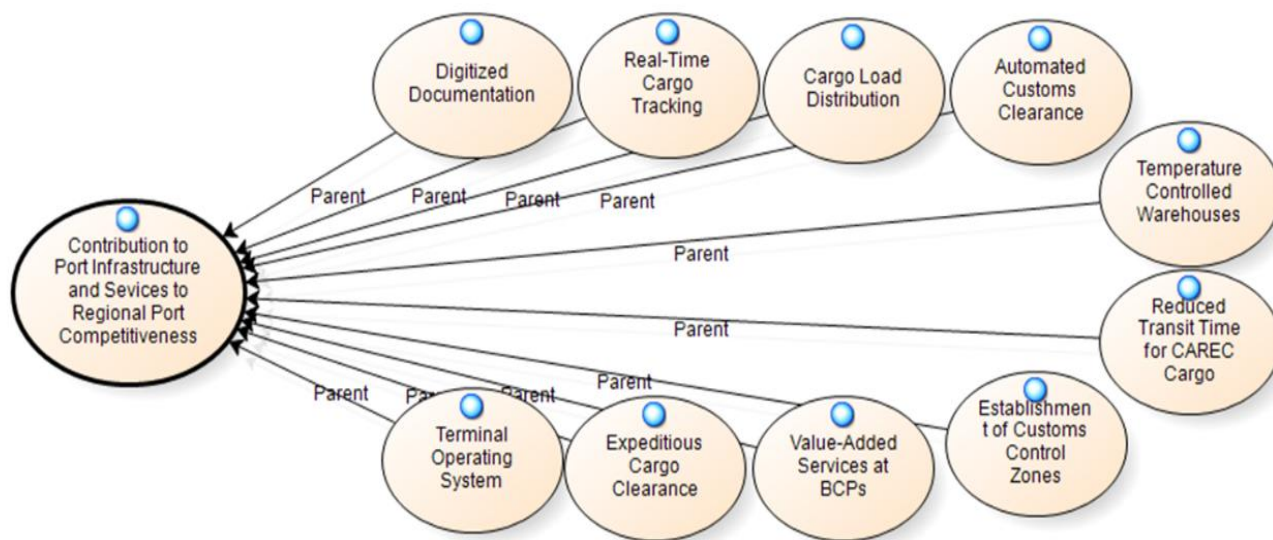
documentation and automated Customs processing at all BCPs' ICT enablement layer would minimize paperwork, speed up border crossing clearance and passenger movement and reduce administrative costs.

Proposition

Adequate and customized port infrastructure and value-added services at all Pakistani BCPs in general and Kharlachi BCP in particular would lead to enhanced trade facilitation in case of supply chain disruptions at other BCPs on the Pak-Afghan border, thereby increasing its competitiveness on the CAREC Corridor.

Figure-2

Code/Node Map – Theme-2 (Contribution of CAREC investments on infrastructure and services to regional port competitiveness)



Theme 3: Route Optimization through Kharlachi may Mitigate Supply Chain Disruptions

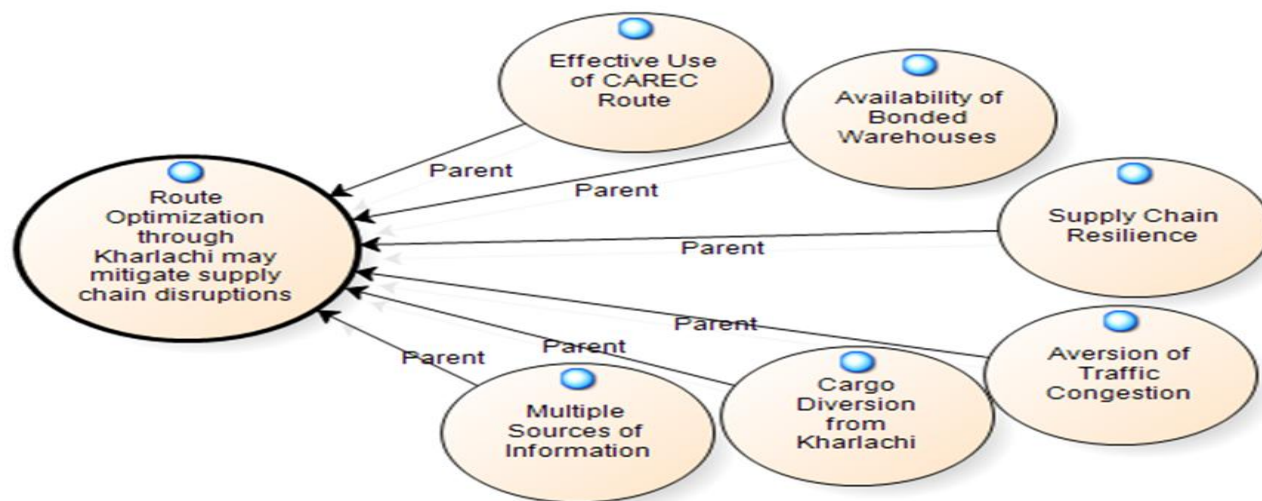
Respondents 1, 2, 3, and 5 opined that Kharlachi BCP is at a suitable location from where the CAREC transit cargo load heading towards Torkham and Chaman can easily be diverted to Kharlachi and distributed to the main traffic arteries in case of traffic congestion. However, Respondents 1, 2, 3, 5, 6, and 13 were of the view that due to frequent supply chain disruptions arising out of sit-ins by the local tribes, and occasional law and order situation in the area of both Torkham and Chaman, long queues of trucks and containers are formed which hamper normal traffic as well. They were of the view that provision of ample storage space for cargo in the form of bonded warehouses in and around Kharlachi BCP may also help in clearing congestion in the goods examination sheds in case all goods are diverted to Kharlachi. Respondents 6 and 13 were of the view that the cross-border trade route if optimized to pass through Kharlachi BCP may significantly avert the probability of traffic congestion or blockade in case any supply chain disruptions. All respondents were in unison that the route optimization through Kharlachi has potential to make effective use of the CAREC Corridor. Respondents 1, 2, 3, 5 and 20 opined that Kharlachi BCP is at a suitable location from where the CAREC transit cargo load heading towards Torkham and Chaman can easily be diverted to Kharlachi and distributed to the main traffic arteries. They were of the view that provision of ample storage space for cargo in the form of bonded warehouses in and around Kharlachi BCP may also help in clearing congestion in the goods examination sheds in case all goods are diverted to Kharlachi. Respondents 6, 7 and 10 urged that data related to supply chain disruptions regarding sudden closure of a trade route can come from various sources like news feeds, sensor networks, GPS tracking of shipments, weather reports, and even social media updates. They were therefore of the view that all BCP may be duly connected to the nearest major cities with optic fiber cable to get immediate access to such information for supply chain resilience.

Proposition

Route optimization relies on real-time data about the supply chain disruption and resultant sudden closure of a trade route. This information may include the severity of the disruption, estimated duration, and its impact on transportation routes and node capacity. Kharlachi, being at a suitable location between Torkham and Chaman BCPs, may provide the transition arrangement during a trade route disruption. To make route optimization critically effective through Kharlachi BCP, a robust ICT infrastructure and optic fiber connectivity to the nearest major city is imperative.

Figure-3

Code/Node Map – Theme-3 (Route Optimization through Kharlachi may mitigate supply chain disruptions)



Theme 4: Multi-Modal Transportation Network for CAREC Route Optimization

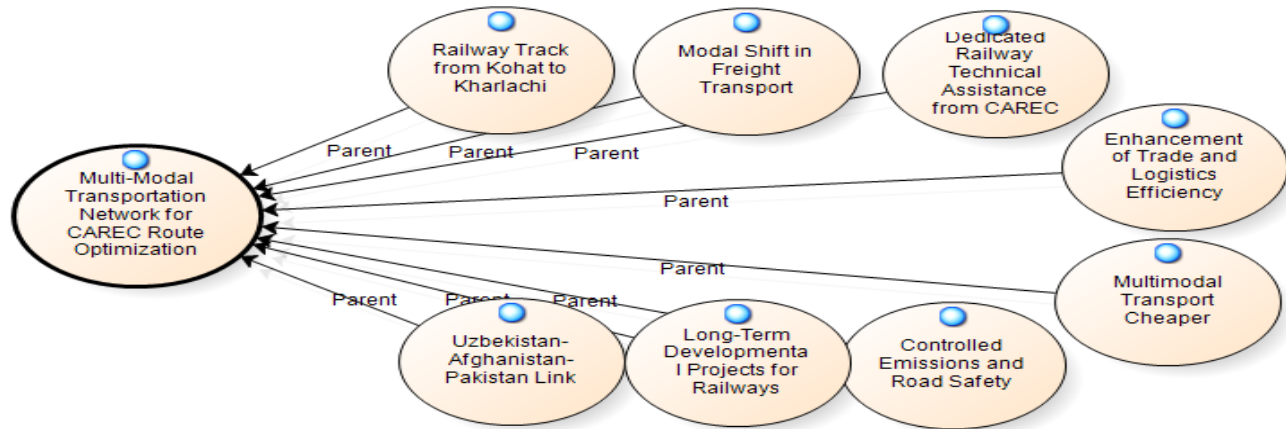
Respondent 12 informed that a 192 Km long Railway development Project has been planned from Kohat to Kharlachi via Parachinar District for coal transportation in the Federal budget 2024-25. He informed that it will be part of a 573 Km Uzbekistan–Afghanistan–Pakistan Railway Project which is an extensive project undertaking with the objective of creating a direct railway link between Uzbekistan and Pakistan, passing through Afghanistan's territory. Respondents 6, 12, 13, 15, 16, 17, 18 and 19 were of the consolidated view that this project aims to enhance trade and logistics efficiency of Kharlachi BCP by establishing a 573-km rail connection in parallel to the road network from Kohat to Tashkent, the capital of Uzbekistan, via Kabul. Respondent 12 apprised that currently the feasibility study is in progress by a team of consultants for the 1st phase of 192 Km from Kohat to Kharlachi via Tehsil Thal in Hangu District in Khyber Pakhtunkhwa Province. Respondents 13 and 14 apprised that the long-haul cargo movement through railway multi-modal transport is cheaper. Respondent 15 and 17 added that the cost of transportation per unit of carried goods will be reduced along with the quantity of emissions and improved road safety, as fewer trucks are required to ply on the trade routes. He added that the modal shift in freight transport that was triggered by surging ocean freight rates benefited the CAREC Corridor 2 and heightened interest in developing it into a more viable overland route, preferably by rail to drastically reduce transportation costs beyond 600 kms. He apprised that a railway strategy for CAREC (2017–2030) has been formulated which supports the long-term development of the railway sector in all CAREC countries to facilitate cross-border trade and promote economic development in the region. Respondent 12 affirmed that a dedicated railway sector Technical Assistance (TA) has been launched in 2019 by the CAREC Program to provide practical support to the concerned railway ministries through prefeasibility studies, knowledge sharing and management support. He hoped that completion of the Uzbekistan–Afghanistan–Pakistan Railway Project passing through Kharlachi BCP and connecting the rail Corridor with major cities of Pakistan would foster the utilization of less-costly rail transportation for long distances in the CAREC region.

Proposition

Multi-modal facility at Kharlachi BCP may have a higher rate of attracting CAREC Cargo flow which would provide comparatively low cost for transporting goods to long distances.

Figure-4

Code/Node Map – Theme-4 (Multi-Modal Transportation Network for CAREC Route Optimization)



Discussion

Interrelation of Key Factors (Themes and Sub-Themes)

The multi-modality and alternate port location tends to influence the competitiveness of border land ports in addition to the administrative efficiency and development of port physical infrastructure as determined by this study. These factors are interconnected and work together to determine the overall competitiveness of a port as has been found by Hu et al. (2018); Vinokurov et al. (2022). Having well-defined and consistent infrastructure development policies helps to achieve the compliance standards for expediting trade processes (Bhatti, 2024; Khan et al., 2024). Respondents highlighted the importance of reducing dwell time, alternate supply chain route, multi-modal transport facility improve port competitiveness. These elements work together to create a stable and predictable environment that strengthens port competitiveness and promotes regional trade integration (Nekhoroshkov et al., 2022; Tian et al., 2024).

Implications for Regional Trade

Tackling the identified obstacles by the government can result in substantial advantages for regional trade. Efficient investment facilitation can reduce costs, enhance logistics efficiency, and attract foreign investment, which can contribute to economic growth desired by every government (Gumbo & Nkala, 2024). Improving port operational efficiency can speed up cross-border trade, minimize delays, and facilitate smooth transactions, thereby promoting envisioned regional connectivity (Kaledio & Elisha, 2024). Respondents emphasized the significance of these enhancements in establishing Pakistani border land ports as key centers within the CAREC Corridor, promoting regional economic integration and collaboration (Bhatti, 2024; Cocuzza, Ignaccolo, & Campisi, 2024).

Comparative Analysis

A comparison with other regional studies and worldwide best practices indicates the two-pronged strategy of alternate port selection for route optimization and the adoption of the modal facility in freight transport elsewhere for long-distance freight cost reduction in the CAREC region (CAREC 2017–2030) which may become part of the long-term development of the railway sector in all CAREC countries to facilitate cross-border trade and promote economic development in the region. These examples indicate that implementing similar best practices can improve the competitiveness of Pakistan's border land ports (Bhatti, 2024).

Conclusion

This article highlights the significance of an adequate port infrastructure and provision of digitalized value-added services at the Pakistani Border Crossing Points, ensuring reduced dwell time and port costs, and in return attracting more CAREC transit trade flow, being regionally more competitive. Frequent supply chain disruptions have been observed recently en-route to Torkham and Chaman BCPs at the Pak-Afghan border due to local tribe sit-ins and law and severe weather, causing long queues of trucks and containers.

The paper therefore explores the development prospects of Kharalchi BCP in Pakistan as a means of providing an alternate cargo clearance border terminal for interruption-free cross-border cargo movement. Kharlachi BCP, currently operational but much smaller in size compared to Torkham and Chaman BCPs, holds the prospects of offering the cargo load, congested at other BCPs, to be distributed through it if the trade route on the CAREC Corridor is optimized for utilization of Kharalachi. Thus, the excess transit cargo can easily be diverted to alleviate traffic congestion if the infrastructure development of Kharlachi BCP is carried out on priority.

As the 573 km Uzbekistan–Afghanistan–Pakistan Railway Project is expected to pass through Kharlachi BCP, CAREC trade flow will also have a multimodal transportation network for low-cost, long-haul movement of goods. All the key stakeholders from the corporate and public sectors emphasized that Kharlachi BCP may be developed as a priority to avail route optimization and multi-modal facility for enhanced interruption-free cross-border trade facilitation on the CAREC Corridor. The paper, therefore, suggests certain policy interventions for development planners in this regard.

References

- Alcaide, J. I., & Llave, R. G. (2020). Critical infrastructures cybersecurity and the maritime sector. *Transportation Research Procedia*, 45, 547-554.
- Altemöller, F. (2011). Towards an international regime of supply chain security: an international relations perspective. *World Customs Journal*, 5(2), 21-34.
- Amin, N. U. (2023). Impact of Fencing upon Pak-Afghan Bilateral [Un] Declared Land Trade Routes: District Kurram. *Peshawar Islamicus*, 14(01), 18-45.
- Asian Development Bank (ADB) (2013a). CAREC From Landlocked to Land-to Land-Linked.
- Ayesu, E. K., Sakyi, D., & Darku, A. B. (2023). Seaport efficiency, port throughput, and economic growth in Africa. *Maritime Economics & Logistics*, 25(3), 479-498.
- Aydiner, A. S., Tatoglu, E., Bayraktar, E., Zaim, S., & Delen, D. (2019). Business analytics and firm performance: The mediating role of business process performance. *Journal of Business Research*, 96, 228-237.
- Barney, J. B. (2018). Why resource-based theory's model of profit appropriation must incorporate a stakeholder perspective. *Strategic Management Journal*, 39; 3305-3325.
- Batista, L. (2012). Translating trade and transport facilitation into strategic operations performance objectives. *Supply Chain Management: An International Journal*.
- Bhatti, O. K. (2024). Assessing Environmental Sustainability in Dry Ports Within the Central Asia Regional Economic Cooperation (CAREC) Framework: A Case Study of Pakistan. *PONTE International Journal of Science and Research*, 80(3).
- Bhatti, O. K., & Hanjra, A. R. (2019). Development prioritization through analytical hierarchy process (AHP)-decision making for port selection on the one belt one road. *Journal of Chinese Economic and Foreign Trade Studies*, 12(3), 121-150.
- Beresford, A., Pettit, S., Xu, Q. and Williams, S. (2012). A study of dry port development in China. *Maritime Economics and Logistics*, 14, 81-83.
- Bichou, K., & Gray, R. (2004). A logistics and supply chain management approach to port performance measurement. *Maritime Policy & Management*, 31(1), 47-67.
- Brooks, M. R., Cullinane, K. P., & Pallis, A. A. (2017a). Revisiting port governance and port reform: A multi-country examination. *Research in Transportation Business & Management*, 100(22), 1-10.

- Cocuzza, E., Ignaccolo, M., & Campisi, T. (2024, March). An analysis of the development of smart ports in the Sicilian context. In *AIP Conference Proceedings* (Vol. 3030, No. 1). AIP Publishing.
- CAREC Transport & Trade Facilitation Strategy 2020 (2013). 12th Ministerial Conference on CAREC, Kazakhstan.
- Chang, Y. T., & Talley, W. K. (2019). Port competitiveness, efficiency, and supply chains: a literature review. *Transportation Journal*, 58(1), 1-20.
- Cho, H. S. (2014). Determinants and effects of logistics costs in container ports: the transaction cost economics perspective. *The Asian Journal of Shipping and Logistics*, 30(2), 193-215.
- De Langen, P. W., Van Meijeren, J., & Tavasszy, L. A. (2012). Combining Models and Commodity Chain Research for Making Long-Term Projections of Port Throughput: An Application to the Hamburg-Le Havre Range. *European Journal of Transport & Infrastructure Research*, 12(3).
- De Langen, P. W., & Sharypova, K. (2013). Intermodal connectivity as a port performance indicator. *Research in Transportation Business & Management*, 8, 97-102.
- Gao, T., Na, S., Dang, X., & Zhang, Y. (2018). Study of the Competitiveness of Quanzhou Port on the Belt and Road in China Based on a Fuzzy-AHP and ELECTRE III Model. *Sustainability*, 10(4), 1253.
- ESCAP, U. (2022). Strengthening port-hinterland sustainable transport connectivity for LLDCs of ESCAP region.
- George, G. (2012). Central Asia's border woes and the impacts of international assistance. Central Eurasia Projects, *Occasional Paper Series*, 6.
- Gichuhi, I. (2021). Effect of dry port operational factors on trade facilitation in Kenya; Doctoral dissertation, Moi University.
- Hanaoka, S., Matsuda, T., Saito, W., Kawasaki, T., & Hiraide, T. (2021). Identifying Factors for Selecting Land over Maritime in Inter-Regional Cross-Border Transport. *Sustainability*, 13(3), 1471.
- Hanjra, A. R., Bhatti, O. K., & Niazi, S. (2017). Understanding Port Efficiency: A CPEC Perspective. *Journal of Management and Research (JMR)* 4(1), 149.
- Hidalgo-Gallego, S., Núñez-Sánchez, R., & Coto-Millán, P. (2021). Strategic interdependence in capacity expansion: A spatial analysis for port infrastructure services. *Transportation Research Part A: Policy and Practice*, 143, 14-29.
- Hirschhorn, L. (1984). "Stakeholders of the Organizational Mind", by Ian Mitroff (Book Review). *Human Resource Management*, 23(4), 428.
- Ismail, N. W. (2021). Digital trade facilitation and bilateral trade in selected Asian countries. *Studies in Economics and Finance*, 38(2), 257-271.
- Kajornboon, A. B. (2005). Using interviews as research instruments. *E-journal for Research Teachers*, 2(1), 1-9.
- Karanam, R. K., Sachani, D. K., Natakam, V. M., Yarlagadda, V. K., & Kothapalli, K. R. V. (2024). Resilient Supply Chains: Strategies for Managing Disruptions in a Globalized Economy. *American Journal of Trade and Policy*, 11(1), 7-16.
- Khan, A. (2017). Pak-Afghan Border. *Strategic Studies*, 37(3), 22-40.
- Khan, K. H., Bastanifar, I., Omid, A., & Khan, Z. (2024). Integrating gravity models and network analysis in logistical strategic planning: a case of the India Middle-East Europe Economic Corridor (IMEC). *Maritime Economics & Logistics*, 1-36.
- Kim, K., Mariano, P., & Abesamis, J. (2022). Trade impact of reducing time and costs at borders in the Central Asia regional economic cooperation region. *Emerging Markets Finance and Trade*, 58(9), 2602-2619.
- Kolioussis, I. G., Papadimitriou, S., Stavroulakis, P. J., & Tsioumas, V. (2018). The management of change within maritime clusters. *FME Transactions*, 46(3), 360-366.
- Koopman, R., Hancock, J., Piermartini, R., & Bekkers, E. (2020). The Value of the WTO. *Journal of Policy Modeling*, 42(4), 829-849.
- Kormych, B. (2018). The Modern Trends of Foreign Trade Policy Implementation: Implications for Customs Regulations. *Lex Portus*, 13, 27.

- Le-Griffin, H. D., & Murphy, M. (2006, February). Container terminal productivity: experiences at the ports of Los Angeles and Long Beach. In *NUF Conference* (pp. 1-21).
- Manners-Bell, J. (2017). *Supply Chain Risk Management: Understanding Emerging Threats to Global Supply Chains*. Kogan Page Publishers.
- Miraj, P., Berawi, M. A., Zagloel, T. Y., Sari, M., & Saroji, G. (2021). Research trend of dry port studies: a two-decade systematic review. *Maritime Policy & Management*, 48(4), 563-582.
- Moteff, J. D., Copeland, C., Fischer, J. W., & Resources, Science, and Industry Division. (2003, January). Critical infrastructures: What makes an infrastructure critical?. Washington, DC, USA: Congressional Research Service, Library of Congress.
- Nekhoroshkov, V., Vakulenko, S., Kurenkov, P., Nekhoroshkov, E., Deruzhinskiy, G., Ignatenko, A., ... & Solskaya, I. (2022). Optimization of the international multimodal container transportation. *Zeszyty Naukowe. Transport/Politechnika Śląska*, (114), 103-114.
- Nguyen, S., & Wang, H. (2018). Prioritizing operational risks in container shipping systems by using cognitive assessment technique. *Maritime Business Review*, 3(2), 185-206.
- Ortiqov, I. (2023). Role of the International & Regional Standards in Development of Customs Pcedures. *Journal of Fundamental Studies*, 1(3), 8-13.
- Parola, F., Pallis, A. A., Risitano, M., & Ferretti, M. (2018). Marketing strategies of Port Authorities: A multi-dimensional theorisation. *Transportation Research Part A: Policy and Practice*, 111, 199-212.
- Pålsson, H., Winslott Hiselius, L., Wandel, S., Khan, J., & Adell, E. (2017). Longer and heavier road freight vehicles in Sweden: Effects on tonne-and vehicle-kilometres, CO2 and socio-economics. *International Journal of Physical Distribution and Logistics Management*, 47(7), 603–622.
- Ramazanova, Z. (2024). Middle Corridor: Eurasia Optimized.
- Sadozai, M., & Blondin, S. (2023). More Remote Yet More Connected? Physical Accessibility and New International Contacts in Tajikistan's Pamirs Since 1991. *Problems of Post-Communism*, 70(3), 290-304.
- Samad, G., & Abbas, Q. (2021). Infrastructure in Central Asia and the Caucasus. *Developing Infrastructure in Central Asia*, 5.
- Saidahrolovich, K. S., & Numonzhonovich, M. M. (2023). Geopolitics of Transport Corridors. *World Economics and Finance Bulletin*, 18, 10-16.
- Sánchez, R. J., Hoffmann, J., Micco, A., Pizzolitto, G. V., Sgut, M., & Wilmsmeier, G. (2003). Port efficiency and international trade: port efficiency as a determinant of maritime transport costs. *Maritime Economics & Logistics*, 5, 199-218.
- Schaltegger, S., Hörisch, J., & Freeman, R. E. (2019). Business cases for sustainability: A stakeholder theory perspective. *Organization & Environment*, 32(3), 191-212.
- Stavroulakis, P. J., Papadimitriou, S., Tsioumas, V., Koliousis, I. G., Riza, E., & Kontolatou, E. O. (2020). Strategic competitiveness in maritime clusters. *Case Studies on Transport Policy*, 8(2), 341-348.
- Stecke, K. E., & Kumar, S. (2009). Sources of supply chain disruptions, factors that breed vulnerability, and mitigating strategies. *Journal of Marketing Channels*, 16(3), 193-226.
- Talley, W. K. (2011). Is port throughput a port output?. In *Advances in Maritime Logistics and Supply Chain Systems* (pp. 117-129).
- Tanabe, S., Shibasaki, R., & Kato, H. (2015). *International Cargo Flow under Improved Border-Crossing Services in Central Asia* (No. 15-2897).
- Tavakol, M., & Sandars, J. (2014). Quantitative and qualitative methods in medical education research: AMEE Guide No 90: Part II. *Medical teacher*, 36(10), 838-848.
- Tian, A. Q., Wang, X. Y., Xu, H., Pan, J. S., Snášel, V., & Lv, H. X. (2024). Multi-objective optimization model for railway heavy-haul traffic: addressing carbon emissions reduction and transport efficiency improvement. *Energy*, 294, 130927
- Tongzon, J. L. (2009). Port choice and freight forwarders. *Transportation Research Part E: Logistics and Transportation Review*, 45(1), 186-195.

- Tukamuhabwa, B., Stevenson, M., & Busby, J. (2017). Supply chain resilience in a developing country context: a case study on the interconnectedness of threats, strategies and outcomes. *Supply Chain Management: An International Journal*, 22(6), 486-505.
- Urciuoli, L., Männistö, T., Hintsa, J., & Khan, T. (2013). Supply chain cyber security—potential threats. *Information & Security: An International Journal*, 29(1).
- Van Klink, H. A., & van Den Berg, G. C. (1998). Gateways and intermodalism. *Journal of Transport Geography*, 6(1), 1-9.
- van Dyck, G. K., & Ismael, H. M. (2015). Multi-criteria evaluation of port competitiveness in West Africa using analytic hierarchy process (AHP). *American Journal of Industrial and Business Management*, 5(6), 432-446.
- Wei, H., & Dong, M. (2019). Import-export freight organization and optimization in the dry-port-based cross-border logistics network under the Belt and Road Initiative. *Computers & Industrial Engineering*, 130, 472-484.
- Widdowson, D., Short, G., Blegen, B., & Kashubsky, M. (2018). National committees on trade facilitation. *World Customs Journal*, 12(1), 27-48.
- Xie, X., Li, J., & Ma, C. (2015, December). Research on employment opportunities under the framework of China Pakistan economic corridor. In *Proceedings of International Conference on CPEC, GC University, Lahore* (pp. 108-113).
- Yeo, A. D., & Deng, A. (2020). Logistics performance as a mediator of the relationship between trade facilitation and international trade: A mediation analysis. *South African Journal of Economic and Management Sciences*, 23(1), 1-11.
- Yeo, K. T., & Song, D. W. (2003). An evaluation of container ports in China and Korea with the analytic hierarchy process. *Journal of the Eastern Asia Society for Transportation Studies*, 5, 726-741.
- Zakir, D., Greenwood, I., & Ayoobi, A. (2024). *Sustainable Transport Infrastructure: Road Asset Management in the CAREC Region* (No. 1437). ADBI Working Paper.

Factors Influencing Intrinsic Motivation: A Study of the Association between Employees Autonomy, Family Motivation and fairness Perception

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Abstract

Intrinsic motivation plays a crucial role in an organization as leaders aim to boost employee effectiveness. This study examines the factors that impact intrinsic motivation, with a focus on employee autonomy, familial drive, perception of fairness, and intrinsic motivation. Data was gathered from 418 teachers in various schools in Lahore, Pakistan. Using the Self-Determination Theory, this research highlights the significant role of employee motivation in aligning with individuals' natural desire for personal and professional growth. This study uses a survey questionnaire and target public, private and semi-private 418 teachers from 39 schools. Convenience sampling technique has been used to gather the data. Descriptive and inferential statistics have been implied to analyze the data. SPSS & Process Hayes have used for data analysis. Statistical findings demonstrated a positive link between employee autonomy, family motivation, fairness perception, and intrinsic motivation. These findings have important implications for organizations looking to foster a positive environment for their employees. This study contributes to the growing body of knowledge on organizational culture and behavior. By offering practical insights, this research aids organizations in understanding the importance of motivation and recognizing employees as essential assets.

Keywords: Employee Autonomy, Family Motivation, Intrinsic Motivation, Fairness Perception

Introduction

The perpetual challenge of employees to perform at their highest level has long confounded organizational leaders. Delving into the complexities of human motivation has been a centuries-old puzzle, with esteemed figures such as Aristotle, Adam Smith, Sigmund Freud, and Abraham Maslow offering profound insights into the intricacies of human behavior. Their contributions have greatly enhanced our comprehension of the driving forces behind individual actions (Chung, 2011). Intrinsic motivation, as defined by Srivastava and Barmola (2011), occurs when a worker is driven by their own desires and satisfaction. This type of motivation includes an individual's natural inclination to hone their skills through practice, as described by Ryan and Deci (2001). It is a powerful force that influences employees to perform at different levels depending on the circumstances (Ryan & Deci, 2000). Those who are intrinsically motivated are more likely to be curious, adaptable, eager to learn, and willing to try new approaches (Amabile, 1996). Additionally, intrinsic motivation contributes to a positive organizational culture, fostering a supportive and productive environment (Awais, Ullah, Sulehri, Thas Thaker, & Mohsin, 2022; Lazauskaite et al., 2015). When employees find fulfillment in their work, they not only benefit the organization but also enhance the well-being of their coworkers (Ryan & Connell, 1989).

According to the Self-Determination theory, intrinsic motivation forecasts enhanced learning, better performance, prime development, and psychological wellbeing of employees (Deci & Ryan, 2012). High intrinsic motivation is related to the state of positive affection (Reeve & Cole, 1987) whereas, low intrinsic motivation causes employees to be uninterested in their work and they are controlled to perform (Grant, 2008).

Employee autonomy is a critical concept in the recent theories of work design and motivation (Gagne & Deci, 2005). Previous researches referred employee autonomy as the choice of individuals to perform their

job tasks (Hackman & Oldham, 1976). The concept of autonomy has changed over time and is referred as freedom of employees to organize their tasks and introduce new procedures to complete those tasks (Morgeson & Humphrey, 2006). Employees with greater control on their jobs are more motivated as it leads them to experience and they face new challenges (Awais, Zulfiqar, Saghir, Sohail, & Rana, 2022; Morgeson et al., 2005). Most researches have analyzed the impact of autonomy individually but there is a need to analyze the effect of autonomy with motivation (Sutanto et al., 2018). Therefore, the present research tries to analyze the effect of employee autonomy on intrinsic motivation. Figure 1 summarizes the theoretical framework of present research.

The concept of family motivation has been steadily gaining recognition (Wang et al., 2024). It is a source of spirit for life (Ryff & Singer, 1998). Prior studies in the field of Human Resource Management have demonstrated that the influence of family serves as a significant driving force for employees in achieving high-performance levels (Tariq & Ding, 2018). Majorly, these researches were about the negative aspects of work and family relationships like work-life conflicts which resulted in negative outputs for the organizations (Greenhaus & Beutell, 1985). Only a few researches have covered the positive aspects of work and family relationships like family motivation to work (Umrani et al., 2019). It appears as a valuable task to explore the significance of family motivation to the employees' work performance results. This would benefit human resource managers to well identify the constructive role that family motivation plays in individuals' performance. Thus, the present study investigates the possible favorable influence of family motivation on intrinsic motivation.

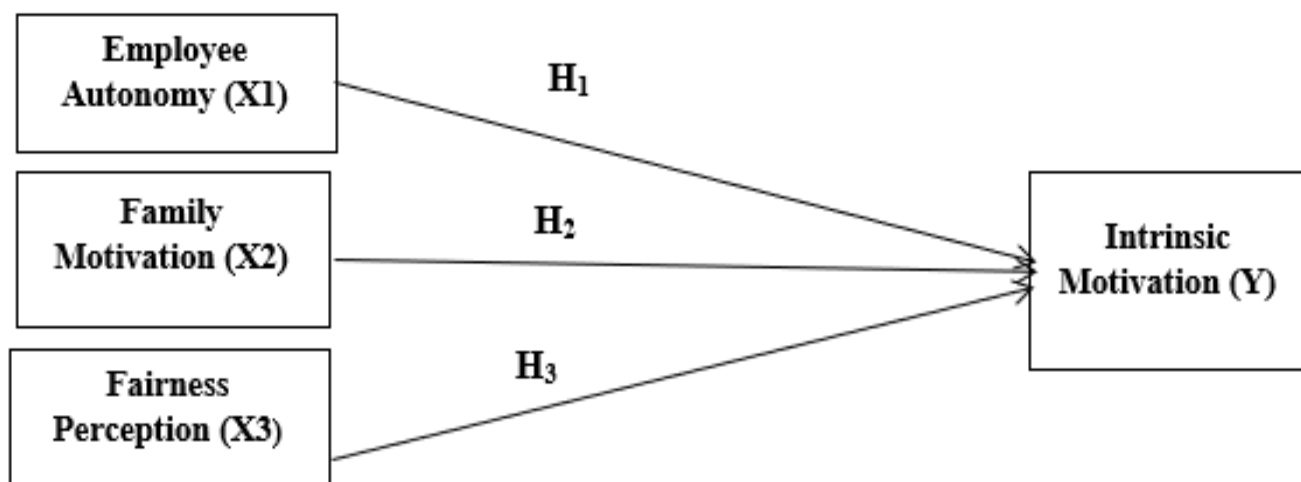


Figure 1. Theoretical Framework

Fair treatment plays an important role in the outcomes of employees' work; it positively affects the results like motivating the employee (Van Knippenberg & De Cremer 2008). Fairness perception refers to employees' idea of transparency employees receive in the organization (Elovainio et al., 2005). Employees are enthusiastic to function efficiently when there is equilibrium in the efforts they put in and the rewards they get. Employee motivation leads to lower absenteeism as employees are keen to work with the same company and enjoy the benefits (Jyoti & Sharma, 2006). Prior researchers have studied the dimensions of fairness perception in detail but there is a need to analyze the impact of fair treatment on the motivation of the employee (Sutanto et al., 2018). So, the current study analyzes the impact of fairness perception on intrinsic motivation.

The present research examines the impact of employee autonomy, family motivation, and fairness perception on intrinsic motivation. It contributes to the literature on employee motivation by Deci and Ryan (2012). The majority of researches consider the types of employee motivation – intrinsic, extrinsic, and family- as a whole but the current study examines the impact of other study variables solely on intrinsic motivation.

Literature Review and Hypotheses Development

Intrinsic Motivation

Intrinsic motivation is described as conduct motivated by an individual's desire to learn or develop themselves; individual participation in an activity owing to the challenge and enjoyment of the activity (Harpine, 2015). When a person is intrinsically driven, he or she engages in an activity for the joy or challenge it provides, rather than for the potential rewards. Intrinsically driven behavior is defined as behavior that is motivated by a person's desire to feel competent and independent. The role of particular psychological states in the experience of intrinsic motivation has been stressed by theorists, such as a sense of self-determination, or perceived control over task involvement, which can help to improve self-perceptions of competence (Awais, Kashif, & Raza, 2020; Ryan & Deci, 2000).

Personal characteristics or events that promote individuals to be intrinsically motivated might boost affective commitment, according to Meyer and Herscovitch (2001). Individuals who are inspired by the challenge and pleasure of the work or task at hand are more likely to have a strong emotional attachment to the company (Huang, 2015). An organization can boost employee affective commitment by managing intrinsic motivation (Nujjo & Meyer, 2012).

Employees who are intrinsically motivated are seen as more self-driven and autonomous than those who are not, meaning that when offered developmental opportunities, they will bear more responsibility for ensuring the required levels of talents and skills (Thomas, 2002). Employees with higher intrinsic motivation are more exceptionally occupied with their positions than those with lower intrinsic drive. Employees may unquestionably use developmental opportunities to extend their work exertion, while becoming more interested and involved with their peer's work. Employees who are intrinsically motivated will tend to make their selves more productive, are more viable at meeting objectives, and are satisfied (Koestner et al., 2008).

Employee Autonomy and Intrinsic Motivation

Employee autonomy refers to the extent a job provides prudence, opportunity and liberty to the employees in scheduling their work and recognizing the techniques that can be used in the completion of a task (Hackman & Oldham, 1976). According to Chen and Chiu (2009), job autonomy is related to job involvement which promotes employee participation on a daily basis. Even when there is an absence of incentives that are operationally separable, people's instincts are alluded to by intrinsic motivation so that they can be keen, explore new opportunities, and resolve conflicts and difficulties so that they can grow by practicing their abilities and implementing their knowledge. Intrinsic motivation anticipates optimal development, learning, creativity, and performance along with psychological wellness as per the Self-determination theory for the last four decades (Ryan & Deci, 2017).

Intrinsic motivation can be driven by the external forces that suit an individual's urge for competence and autonomy according to the self-determination theory (Ryan & Deci, 2000). When given the job autonomy, the employees are satisfied with their desires to learn new skills instantly, proficient work experiences, and taking charge of the new task at job (Parker et al., 2006). When employees are self-determined in carrying out their activities and proficient professionally in performing their tasks, they are said to possess high intrinsic motivation (Ryan & Deci, 2000). According to past researches, there is an association between the organizational characteristics and autonomy at work. There is a strong relationship between organizational commitment and job autonomy whereas mental affluence is a business that is said to be more quality competitive (Park & Searcy, 2012).

The Cognitive Evaluation states that the leaders who promote and practice competency and autonomy pertain to non-controlling and positive feedback with respect for diverse opinions and views nurtures cordial relationships with the subordinates implement strategies that lead to the self-determination within the employees. (Hirschler et al., 2014). While assisting their subordinates in building their skills and core competencies, the leaders have to redirect their activities and occupational competencies (Zhu et al., 2004).

In this way, their adherents can sense their improved competence and self-efficacy which leads to an enhanced intrinsic motivation.

The intrinsically motivated employees are viewed as being more self-driven and sovereign in comparison to those who aren't conforming to the situations when they are given the development opportunities, they would have to bear much larger responsibility for the assurance of the required sets of skills and abilities (Thomas, 2002). Employees with a higher sense of intrinsic motivation show a wholehearted engagement in their respective jobs in contrast to the ones that have a lower intrinsic impel (Vansteenkiste et al., 2007). The employees might make use of the incontrovertibly presented formative opportunities for the expansion of their efforts along with participating more with their subordinates and coworkers. So, we can constitute that:

H₁: There is a positive relationship between employee autonomy and intrinsic motivation.

Family Motivation and Intrinsic Motivation

A family consists of individuals that are connected by marriages, adoption, family ties, and customs (Edwards & Rothbard, 2000). Family motivation relates to the desire to expand efforts for the benefit of one's family (Menges et al., 2017). The families of the individuals are the direct recipients of the benefits derived from the employee's family motivation (Grant, 2007). However, family motivation does not directly link with an employee's job and pertains to being constant in different and changing circumstances.

Employees feel more enthusiastic and passionate about their jobs as family motivation affects the personal relationships of the employees (Menges et al., 2017). Employees recognize that their tasks play a significant role in supporting their families and that their requirements and desires can be fulfilled by the job roles that they perform and the tasks that they carry out at work. The employees are valued for their untiring efforts by their families which boosts their self-esteem and confidence making them self-satisfied and motivated (Erum et al., 2020).

Intrinsic motivation relates to the urge to accomplish a particular task and to understand the level of liking and satisfaction derived from being a part of the task (Deci et al., 1989). Intrinsic motivation plays an integral role in predicting the performance of employees (Van Yperen & Hagedoorn, 2003). Intrinsic motivation is the outcome of the affirmative response of the employees to the work qualities (Amabile, 1996).

Independence is a crucial aspect of Intrinsic motivation which refers to the aspect that employees with an internal urge to excel and complete the job tasks are the ones motivated with sheer interest in carrying out their assigned work. The contentment of the work accomplishment automatically yearns them to perform wholeheartedly so the selection to invest their energy is their will (Grant, 2008). As per Ng et al. (2006), locus of control is a factor that is associated with employee's intrinsic motivation. When the employees are entirely involved in the work activity, they tend to perform more effectively which is an element of the employees' internal motivation (Joo et al., 2010). According to earlier researches, there has been a positive alliance between intrinsic motivation and job performance (Grant, 2008).

When an employee is motivated by his/her family, he works more efficiently due to an emotional attachment of the employee to his kith and kin and ultimately, it is the family who enjoys the benefits derived from the efforts of the employee (Burnstein et al., 1994; Hall & Chandler, 2005). Family motivation reinforces the exertions of the employee which leads to constructive outcomes (Menges et al., 2017).

When there is a high family motivation backing an employee, he prioritizes the work more worthy as it directly affects the well-being of the employee's family and urges the employee to work more effectively and extensively (Awais, Niaz, & Saghir, 2024; Duckworth et al., 2007). So, it leads to a higher work commitment of the employees (Erum et al., 2021). With cognitive job creation and decreased exertion and asset utilization, family motivation is regarded as a favorable component (Erum et al., 2021). When

employees can support the families, they fulfill their aims and life objectives as a result they become intrinsically motivated (Russo et al., 2016).

Therefore, family motivation is considered to be a significant element for the employees to carry out the activities related to work and results in a bright perspective for the employees. When the employees are motivated due to family and relationships, they tend to be more content as the family's livelihood is enhanced and their needs are being fulfilled, so the employees feel internally passionate and are more inclined towards intrinsic motivation (King et al., 1995). We can therefore say that:

H₂: There is a positive relationship between family motivation and intrinsic motivation.

Fairness Perception and Intrinsic Motivation

Over the last few decades, organizational justice, defined as the fairness perception within the organization, has been one of the most researched ideas in organizational behavior. Fairness Perception in the workplace is linked to the efforts made and the benefits received as a result (Mowday, 1991). It discusses how employers evaluate employees' efforts in terms of energy, skills, experience, time, and other factors, as well as the rewards and returns they receive in exchange for their efforts, such as recognition, fringe benefits, position and rank, authority, financial benefits, and so on (Adams, 1965).

Employees believe that their efforts are being rewarded, and they have a higher level of job satisfaction as a result of increased fairness perception in the workplace. They exhibit positive work conduct and contribute to the organization's success (Aryani, 2009). Employees who understand that they have better benefits coverage than their subordinates are more satisfied than their peers (Williams, 1995). Employees gladly commit to the organizations when they are treated with distributive fairness. Employees believe the incentive system conforms with their training, responsibilities, and workload at the firm when they sense distributive justice (Chahal & Mehta, 2010). Employees are regarded to have increased energy levels, and they enthusiastically execute job-related duties by utilizing all of their skills and working in the organization's best interests and for the benefit of the organization (Selvarajan & Cloninger, 2012). Employees are more eager to operate efficiently and enthusiastically when there is a balance between their efforts and rewards. Employees are motivated, which leads to a lower turnover rate (Jyoti & Sharma, 2006) since employees are eager to stay with the same company and work for its benefits.

Employees have fair perception and strive to serve the organization's best interests by demonstrating low absenteeism and excellent workplace productivity (Cropanzano et al., 2007). This is because they are highly motivated and enthusiastic about attending work daily and working tirelessly to achieve the organization's goals and objectives. On the other hand, it is in the best interests of the organization when personnel are motivated. This is because when employees are imbued with a higher level of fair and reasonable incentive systems at work, they foster strong and friendly relationships with one another, among employees and management, subordinates and the organization, based on trust, and they amplify organizational commitment (Alexander et al., 1987; Folger et al., 1989).

The major antecedent predicting workplace views toward personal outcomes, such as job satisfaction, is distributive fairness (McFarlin & Sweeney, 1992). Workers prioritize distributive justice to optimize their results because they believe that fair distributions will result in favorable distributions. Lind and Tyler (1988) claim that individuals receive a portion of their self-esteem from knowing that they are valued members of valued organizations, based on social identity theory. More specifically, respect is conveyed by procedurally equitable treatment by group authorities, which enhances self-esteem. Furthermore, people gain self-esteem from belonging to a group whose authorities implement procedural fairness because they perceive authorities as a reflection of the group's basic norms and values (Tyler et al., 1996).

H₃: There is a positive relationship between fairness perception and intrinsic motivation.

Self Determination Theory

Self Determination theory suggests that the employees are determined to growth and prosper when their needs related to autonomy, communication and competence are fulfilled. They are highly focused on internal motivational sources like the knowledge gain, experience and independence rather than the external sources including money, praises and benefits. They willingly master various challenges and are more open for new experiences for the development of a cohesive sense of self-motivation.

Methodology

To examine the relationship between the study variables of the conducted research, the data was collected from various educational institutions in a cross-sectional study setting. We conducted a survey that was based on questionnaires in a non-contrived setting. We targeted the currently employed teachers in schools from amongst the educational institutions. This is because, they are the ones who perform the wider roles, are core assets of the institutions, and due to variance in the dynamics of higher educational institutions and the primary level schools. Convenience sampling technique has been used to gather the data.

Name of school and number of participants		
Sr#.	Name of School	Number of Participants
1.	Abdali Grammar School	7
2.	Adabistan -e- Sophia	8
3.	Aitchison High School	21
4.	Aligarh Public School	10
5.	Ali Public School	6
6.	Allied School	8
7.	Al-Saud International School	2
8.	American Lycetuff	17
9.	Army Public School	8
10.	Beaconhouse School System	5
11.	Bloomfield Hall School	4
12.	Cgss	2
13.	Customs Public School	4
14.	Dar-e-Arqam	7
15.	Education Department	17
16.	Govt. Tahir Model School	4
17.	HQ School	6
18.	Junior Public School	6
19.	LACAS	4
20.	Lahore Garrison Education System	22
21.	Lahore Grammar School	83
22.	Lahore Literati Montessori School	8
23.	Mitcon School	2
24.	MQ Foundation	6
25.	National Grammar School	6
26.	NEXUS School	6
27.	Private School	27
28.	Roots Millennium School	6
29.	Royal Balsam School	2
30.	Saint Anthony School	2
31.	SCIL	6
32.	Stepping Stones Schools	3
33.	The City School	7
34.	Crescent School	23
35.	The Scope School	20
36.	The Trust School	4
37.	Unique High School	13
38.	Unknown	11
39.	Yousaf School System	15
Total		418

We reached out to 418 teachers from different public, private, and semi-private schools, by carrying out the convenience sampling. From a sample of 418 teachers from almost 39 schools, there were 168 male teachers (40%) and there were 250 female teachers (60%) from both private and public schools. We collected the data both physically and electronically. We managed to attain 195 physical questionnaires and 223 online questionnaires. Google Forms was used to distribute the online survey questionnaires and physical questionnaires were filled in after being granted permission by the school's administration to make personal visits to schools and complete the survey questionnaires.

We distributed a total of 262 physical questionnaires and returned back 195 filled questionnaires having a 74% response rate. The age of the respondents ranges between 23-62 years with a 38.75 mean and 9.150 standard deviations. The participants had a minimum of 12 months of working tenure with their current organizations while the maximum tenure of the respondents was 34 years of working with the same organization with a 7.60 mean and 5.956 standard deviation. The participants had a 14-18 years qualification with a 16.31 mean and 1.244 standard deviation. The working experience of the respondents was a maximum 35 years and less than 12 months minimum with a 12.25 mean and 8.119 standard deviation.

Measures

The scales in the literature reviews were used for the measurement purposes of the major constructs. A 5-point Likert Scale was used by each measure and ranged between strongly disagree (1) and strongly agree (5).

Employee autonomy was anticipated by making use of the 9-item scale that was used by Saragih (2015). The items in the scale inquired from the employees about the level of discretion provided to them in performing and scheduling their respective tasks. An item of Job autonomy is, "I am allowed to decide how to go about getting my job done".

The 3-item scale proposed by Ryan and Connell (1989) was used to capture the intrinsic motivation. An item of intrinsic motivation is, "I enjoy the work itself".

The measure proposed by Ambrose Schminke (2009) was used to capture Fairness perception and consisted of 4 items. The items analyzed the degree to which the employees feel that fairness prevails within the organization. An item of Fairness perception is, "Overall, I am treated fairly by my organization".

The 5-item scale was used to capture Family Motivation and the measures were proposed by Ryan and Connell (1989). An item of Family motivation is, "I care about supporting my family".

Analytical Approach

Before hypothesis testing, SPSS version 21 was utilized to calculate the mean, standard deviation, and Bivariate (Pearson) correlation of all the variables including control and study variables. To examine the internal consistency of respective measures, we calculated Cronbach's alpha values, which is the most reliable measure of reliability (Peterson, 1994; Hogan et al., 2000). Data normality was also investigated by computing skewness and kurtosis. For measurement validation, exploratory factor analysis was performed. Lastly, to test hypotheses we carried out hierarchical linear modeling (Bryk & Raudenbush, 1992) and multiple regression.

Results

Descriptive Analysis

Table 1 reports the outcomes of descriptive statistics and Bivariate (Pearson) correlation. Extending the primary support for the hypothesized association between the study variables, correlational coefficients are in expected paths. Congruent to our hypotheses, outcomes revealed that employee autonomy ($r = 0.684$, $p < 0.01$), fairness perception ($r = 0.635$, $p < 0.01$), and family motivation ($r = 0.357$, $p < 0.01$) are positively and significantly correlated to intrinsic motivation. Moreover, significant relationships between

control variables and study variables are demonstrated in Table 1. Results indicate the negative and significant association between gender and fairness perception ($r = -0.126$, $p < 0.05$)

Note: $n = 418$

Table 1. Mean, standard deviations (SD) and correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Age	38.75	9.15	-.227**	.439*	-							
2. Education	16.31	1.24	.007	.035	.085	-						
3. Working Experience	12.25	8.12	-.169**	.393*	.869*	.076	-					
4. Tenure	7.60	5.96	-.037	.364*	.691*	.060	.807*	-				
5. Employee Autonomy	3.40	0.71	-.078	-.073	-.017	.004	-.023	.006	-			
6. Family Motivation	4.21	0.66	-.054	.034	.000	-.011	.024	.004	.248*	-		
7. Intrinsic Motivation	3.86	0.87	-.060	.030	-.014	.067	-.003	.020	.684*	.357*	-	
8. Fairness Perception	3.16	0.91	-.126*	.023	.032	.045	.028	.034	.556*	.235*	.635*	-

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Gender: 1= male, 2 = female

Marital Status: 1 = single, 2 = married, 3 = divorced, 4 = widowed, 5 = separated

Measurement Validation

Exploratory factor analysis along with varimax rotation was carried out on all the study variables (Employee Autonomy, Intrinsic Motivation, Family Motivation, and Fairness Perception) to investigate their dimensionalities and psychometric properties. Kaiser-Meyer-Olkin (KMO), which estimates sampling adequacy, is sufficiently larger than the threshold of 0.6 (Kaiser, 1974) with a value of 0.878. The outcome of Bartlett's test of Sphericity was $\chi^2(210) = 6877.748$, $p < 0.001$, which is statistically significant. It reveals adequately different correlations between variables from zero, suggesting significantly large correlations for exploratory factor analysis. Conducting the eigenvalue analysis, four factors were determined for further analysis having the Eigenvalues of more than 1 and representing 70.849% of the total variance (see Table 2). All the items represent stable factor loadings with a value greater than 0.4 (Guadagnoli & Velicer, 1988). Factor loadings lay between 0.555 and 0.851 for employee autonomy, however for fairness perception factor loadings ranged from 0.474 and 0.893. For family motivation, values of factor loadings fell between 0.763 and 0.878. Lastly, the factor loadings for intrinsic motivation were between 0.714 and 0.810 which is adequately greater than 0.4 (Guadagnoli & Velicer, 1988). The results confirmed that all the variables are independent of each other and each item belongs to the anticipated factor structure.

Table 2. Exploratory Factor Analysis

Items	Components			
	Employee Autonomy	Family Motivation	Intrinsic Motivation	Fairness Perception
EA1	0.851			
EA2	0.840			
EA3	0.828			
EA4	0.771			
EA5	0.555			
EA6	0.668			
EA7	0.588			
EA8	0.679			
EA9	0.630			
FM1		0.869		
FM2		0.878		
FM3		0.867		
FM4		0.795		
FM5		0.763		
IM1			0.810	
IM2			0.759	
IM3			0.714	
FP2				0.474
FP3				0.501
FP4				0.893
FP6				0.857
Eigenvalue	8.805	3.197	1.841	1.036
% of Total Variance	41.926	15.226	8.765	4.932
Total Variance %				70.849

For each of the study variables (employee autonomy, family motivation, fairness perception, and intrinsic motivation), a reliability test was carried out by calculating Cronbach's alpha values to evaluate the internal consistency of study variables that if each of the measures produces consistent outcomes. The results of reliability test are presented in Table 3, ensuring the internal consistency of each construct with the Cronbach's alpha value of more than 0.7 (Cronbach, 1951). The Cronbach's alpha values fell between the range of 0.830 and 0.913, suggesting the data set was free of reliability issues.

Table 3. Reliability and Data Normality

	Scales	Items	Cronbach's α Values	Skewness	Kurtosis
1.	Employee Autonomy	9	0.913	-0.611	-0.206
2.	Family Motivation	5	0.902	-0.880	2.009
3.	Intrinsic Motivation	3	0.913	-0.592	0.183
4.	Fairness Perception	4	0.830	-0.284	-0.431

Kurtosis and skewness were calculated to test the data normality. Kurtosis estimates the distribution by representing the presence of outliers. It measures the degree to which the existing distribution differs from a normal distribution. However, Skewedness reflects the extent of symmetry and asymmetry in the distribution. Both the measures ensure data is normally distributed with the kurtosis falling between -3 and +3 with a standard error of 0.238 and skewness between -1 and +1 with a standard error of 0.119 (Hair et al., 2013).

Hypotheses Testing

To verify the proposed hypotheses of the current study, hierarchical linear modeling (Bryk & Raudenbush, 1992) has been deployed. In model 1, control variables (participants' age, gender, education, years of experience, tenure in the organization, and marital status) were regressed on intrinsic motivation, producing the result exhibiting all the control variables being insignificantly impacting intrinsic motivation (See table 4).

In model 2, we regressed employee autonomy, the independent variable, along with all the control variables on intrinsic motivation, which generated the result exhibiting that employee autonomy positively and significantly impacts the intrinsic motivation ($\beta = 0.689$, $p < 0.01$). Furthermore, the significant and positive effect of the education of masters on intrinsic motivation has been determined ($\beta = 0.066$, $p < 0.10$). Lastly, marriages have a negative and significant impact on intrinsic motivation ($\beta = 0.101$, $p < 0.05$). The variation in R^2 with the help of employee autonomy is 0.467. It means the variance explained by employee autonomy is 46.7%. Thus, H1 is strongly supported.

Family motivation, control factors, and intrinsic motivation were all subjected to regression analysis in model 3. This leads to the observation that family motivation has a favorable and substantial impact on the dependent variable, intrinsic motivation ($\beta = 0.355$, $p < 0.01$). The R^2 change of 0.125 results from the family incentive. So, 12.5% of the variance can be attributed to familial incentives. Consequently, H2 has a lot of support. In model 4, the dependent variable, intrinsic motivation, was regressed along with all the control variables. We noticed that the regression coefficient was highly positive, indicating that the impression of fairness has a favorable and significant impact on intrinsic motivation ($\beta = 0.638$, $p < 0.01$). With the aid of fairness perception, the R^2 has changed by 0.396. This indicates that 39.6% of the variance is explained by fairness perception. H3 is therefore firmly supported.

Furthermore, in model 5, all three research variables—employee autonomy, family motivation, and fairness perception—as well as all the control variables—participants' age, gender, education, marital status, working experience, and tenure in the organization—were regressed on intrinsic motivation using

Table 4: Regression Table for Intrinsic Motivation

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Controls					
Gender	-0.080	-0.017	-0.059	0.024	0.027
Participants' Age	-0.094	-0.105	-0.050	-0.091	-0.080
Education	0.071	0.066*	0.074	0.040	0.053*
Years of working experience	-0.019	0.054	-0.067	0.007	0.022
Tenure in the organization	0.076	0.003	0.090	0.050	0.019
Marital Status	0.046	0.101**	0.029	0.034	0.068*
Study Variables					
Employee Autonomy		0.689***			0.457***
Family Motivation			0.355***		0.162***
Fairness Perception				0.638***	0.345***
R²	0.014	0.481	0.139	0.410	0.595
ΔR^2	-	0.467	0.125	0.396	0.581
Durbin Watson	2.054	2.040	2.014	1.937	1.948

multiple regression analysis. Results showed that each research variable had a favorable and substantial impact on intrinsic motivation ($\beta = 0.457$, $p < 0.01$, $\beta = 0.162$, $p < 0.01$, $\beta = 0.345$, $p < 0.01$). Lastly, intrinsic motivation is positively and significantly influenced by both education and marriage ($\beta = 0.053$, $p < 0.10$; $\beta = 0.068$, $p < 0.10$). Using every research variable, the variation in R^2 is 0.581. It denotes a 58.1% explanation of variance across all study variables.

In recent times, intrinsic motivation has become a critical research topic for researchers, scholars, and psychologists because of its positive consequences for organizations and employees. However, fewer studies have unfortunately been done to ascertain the causes of intrinsic motivation (Chung, J., 2011). The main goal of this research is to investigate the factors that serve as motivation's antecedents. We have identified three factors in particular as the engine of intrinsic motivation: employee autonomy, family motivation, and fairness perception. By identifying the factors that influence intrinsic motivation, the current study adds to the body of knowledge about employee motivation. Our results show that employee autonomy and intrinsic motivation are positively correlated, supporting hypothesis 1. Employees are satisfied with their wishes to learn new skills quickly, have successful work experiences, and take care of new task at work when given job autonomy (Parker et al., 2006). Employing strategies that foster employees' ability to make decisions for themselves, leaders who support and model competency and autonomy, adhere to non-controlling and positive feedback with respect for the diversity of opinions and views and nurture friendly relationships with the subordinates (Hirschler et al., 2014).

We found a strong correlation between family motivation and intrinsic motivation, which is in agreement with hypothesis 2. Employees understand that the tasks they undertake at work are essential to providing for their families and that these jobs, along with their professional positions, can satisfy their needs and wants. As a result, they are more enthusiastic and driven about their work as family motivation influences the employees' interpersonal relationships (Menges et al., 2017). When an employee has strong family support, he or she prioritizes work more highly since it directly affects the welfare of the employee's family. This encourages employees to work harder and more efficiently (Duckworth et al., 2007). By hypothesis 3, the findings show that fairness perception also influences intrinsic motivation. Due to a greater perception of justice in the workplace, employees feel as though their efforts are being rewarded, which leads to a higher degree of job satisfaction. By exhibiting low absenteeism and outstanding job productivity, employees with fair perception try to serve the organization's best interests (Cropanzano et al., 2007). This is a result of their high levels of motivation and enthusiasm for going to work every day and putting in endless effort to meet the organization's goals and objectives.

Discussion

The current study significantly adds to the body of literature on organizational culture and organizational behavior. The focus of existing literature on the subject has predominantly centered on the extrinsic and intrinsic motivations of employees (Ryan & Deci, 2012). There are limited studies that have explored how different employee motivational strategies interact with other factors. The current study has investigated how intrinsic motivation and other study variables (employee autonomy, family motivation, and fairness perception) relate to one another to fill this gap. The current study investigates the relationship between employee autonomy and motivation (Sutanto et al., 2018). The relationship between perceived fairness toward employees and intrinsic motivation has been studied (Sutanto et al., 2018).

The strongest and most direct influence on an employee's intrinsic motivation and performance, in terms of practical implications, may come from supervisors. The first step for managers is to revamp their employment to improve intrinsic motivation and job performance. According to Hackman and Oldham (1980), employment that is hard, complex, and autonomous are more likely to foster high levels of intrinsic motivation than jobs that are more basic, routine, and regulated. This study found that as a result of higher employee morale, businesses that allow employees more job autonomy typically outperform those that don't in terms of productivity, quality, and customer retention (Pfeffer, 1998). Employees with poor intrinsic motivation may need additional autonomous structure, supervisory involvement, and external regulation to work well in terms of structure and supervision. Studies done in the past have mainly concentrated on the negative aspects of family-work connections, like work-life conflicts that have a bad effect on organizational effectiveness. On the other hand, academics tend to focus less on the advantages of such a relationship, like how family may inspire employees. Therefore, organizations ought to consider these advantages. Depending on the perspective of the individual, the family may or may not interfere with work, but it can be a source of motivation to work; having a supportive family raises one's self-esteem. Managers must influence employees' attitudes about their jobs so that they see the benefits to their

families as well as the previously mentioned advantages. Regarding the practical implications of the current study, which support important effects of family motivation, such as job performance, the findings showed that instructors who see their work as a way to support their family feel self-sufficient because they see themselves as capable.

Lastly, the sense of fairness among employees gives them the internal motivation to carry out their tasks effectively since employees constantly compare their inputs and outputs with those of their peers to assess equality and transparency in the organization. Because of this, their belief that they have received a just reward inspires them to carry out their duties effectively and makes them happy.

Conclusion

The current study has made significant literary contributions. First, a cross-sectional study design was used in the research to examine the effects of employee autonomy, family motivation, and perceived justice on intrinsic motivation. It is possible to test the causality between the variables under examination using longitudinal and experimental designs. At a certain point in time, facts about intrinsic motivation, family motivation, job autonomy, and perceived fairness perception came together. In the future, data can be gathered at several times for different study variables to reduce the possibility of biased results (Ployhart & Vandenberg, 2010). Second, Pakistan was chosen as the research site since it is located in an Eastern environment, which raises concerns about the generalizability of the findings due to differences between the contexts of developed and developing countries. To confirm the differences in working environments between organizational and national cultures in various countries, future research has the advantage to be undertaken in European and American countries that are part of developed nations (Abid et al., 2018). Additionally, the study's participants were from a specific Pakistani metropolitan city's educational sector, so it is unable to generalize the findings to the numerous other sectors. To further the research's generalizability, additional research might be conducted on a variety of other operating sectors and industries in Pakistan. Fifth, a small sample size was chosen for the model analysis, allowing future research to be conducted on a larger sample to increase the model's validity.

In addition, there is a high likelihood of bias in the responses provided by the participants when taking into account the variables of intrinsic motivation, job autonomy, fairness perception, and family motivation (Yuan & Woodman, 2010), as a result of the teachers' service status and potential fear of either leakage of their personal opinions or, in the worst-case scenario, of serious action being taken against them. Therefore, more objective metrics and peer reviews may have been taken into consideration shortly (Abid & Butt, 2017). Finally, after data collection and review, a multi-level analysis can be taken into consideration for the examination of numerous demographic characteristics, such as age, education, etc. for a diverse and bigger sample.

References

- Abid, G., & Butt, T. H. (2017). Expressed turnover intention: Alternate method for knowing turnover intention and eradicating common method bias. *International Letters of Social and Humanistic Sciences*, 78, 18–26.
- Abid, G., Sajjad, I., Elahi, N. S., Farooqi, S., & Nisar, A. (2018). The influence of prosocial motivation and civility on work engagement: The mediating role of thriving at work. *Cogent-Business & Management*, 5(1), 1–19.
- Adams, J. S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.). *Advances in Experimental Social Psychology* (Vol. 2, pp. 267-299).
- Amabile, T. M. (1996). Creativity in context: Update to the social psychology of creativity. *Boulder, CO: Westview Press*.
- Ambrose, M. L., & Schminke, M. (2009). The role of overall justice judgments in organizational justice research: A test of mediation. *Journal of Applied Psychology*, 94(2), 491–500.
- Aryani, Y. A. (2009). The Effect of fairness perception of performance measurement in the balanced scorecard environment. Victoria, *Victoria University Press*.

- Awais, M., Kashif, S., & Raza, A. (2020). Status Quo, Monetary Loss-Aversion and Forecasting – An Approach to Invest during Amygdala Damages and Asymmetry. *Global Social Sciences Review* 5(3), 118-127.
- Awais, M., Niaz, M. A., & Saghir, R. (2024). Antecedents of Representative Bias and Choice Decision: A Case of Major Cities of Pakistan. *Research Journal for Societal Issues* 6(3), 209-218.
- Awais, M., Ullah, N., Sulehri, N. A., Thas Thaker, M. A. B. M., & Mohsin, M. (2022). Monitoring and Efficiency in Governance: A Measure for Sustainability in the Islamic Banking Industry. *Frontiers in Psychology*, 13, 884532.
- Awais, M., Zulfiqar, B., Saghir, R., Sohail, A., & Rana, A. U. R. (2022). Psychological Indicator (s) in Stock Activities considering SDGs: The Wealth Maximization Criteria of Investors and Growth of Economy. *NICE Research Journal*, 47-60.
- Bryk, A. S., & Raudenbush, S. W. (1992). Hierarchical linear models for social and behavioral research: Applications and data analysis methods. *Newbury Park, CA: Sage*.
- Burnstein, E., Crandall, C., & Kitayama, S. (1994). Some neo-Darwinian decision rules for altruism: Weighing cues for inclusive fitness as a function of the biological importance of the decision. *Journal of Personality and Social Psychology*, 67, 773–789.
- Chahal, H., & Mehta, S. (2010). Antecedents and consequences of organizational citizenship behavior (OCB): A conceptual framework in reference to health care sector. *Journal of Services Research*, 10(2), 25.
- Chen, C., & Chiu, S. (2009). The mediating role of job involvement in the relationship between job characteristics and organizational citizenship behavior. *The Journal of Social Psychology*, 149, 474–494.
- Chung, J. (2011). Employee Motivation a Powerful New Model.
- Colquitt, J. A., & Rodell, J. B. (2015). Measuring justice and fairness. *The Oxford handbook of justice in the workplace*, 1, 187-202.
- Cordes, C. L., & Dougherty, T. W. (1993). A review and an integration of research on job burnout. *Academy of Management Review*, 18, 621-656.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika*, 16(3), 297-334.
- Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology*, 74(4), 580–590.
- Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. *The Oxford handbook of human Motivation*, 18(6), 85-107.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087.
- Edwards, J. R., & Rothbard, N. P. (2000). Mechanisms linking work and family: Clarifying the relationship between work and family constructs. *Academy of Management Review*, 25(1), 178-199.
- Elovainio, M., van den Bos, K., Linna, A., Kivimäki, M., Ala-Mursula, L., Pentti, J., & Vahtera, J. (2005). Combined effects of uncertainty and organizational justice on employee health: testing the uncertainty management model of fairness judgments among Finnish public sector employees. *Social Science & Medicine*, 61(12), 2501-2512.
- Erum, H., Abid, G., Anwar, A., Ijaz, M. F., & Kee, D. M. H. (2021). My Family Stands Behind Me: Moderated Mediation Model of Family Support and Work Engagement. *European Journal of Investigation in Health, Psychology and Education*, 11(2), 321-333.
- Erum, H., Abid, G., Contreras, F., & Islam, T. (2020). Role of family motivation, workplace civility and self-efficacy in developing affective commitment and organizational citizenship behavior. *European Journal of Investigation in Health, Psychology and Education*, 10(1), 358-374.
- Farh, J. L., Zhong, C. B., & Organ, D. W. (2004). Organizational citizenship behavior in the People's Republic of China. *Organization Science*, 15(2), 241-253.

- Folger, R., & Konovsky, M. A. (1989). Effects of procedural and distributive justice on reactions to pay raise decisions. *Academy of Management Journal*, 32(1), 115-130.
- Grant, A. M. (2007). Relational job design and the motivation to make a prosocial difference. *Academy of Management Review*, 32, 393–417.
- Grant, A. M. (2008). Does intrinsic motivation fuel the prosocial fire? Motivational synergy in predicting persistence, performance, and productivity. *Journal of Applied Psychology*, 93(1), 48.
- Greenhaus, J. H., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of Management Review*, 10(1), 76-88.
- Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin*, 103, 265- 275. doi:10.1037/0033-2909.103.2.265
- Hackman, J. R. (1980). Work redesign. *Reading/Addison-Wesley*.
- Hackman, J. R. (1976). Motivation through the design work: Test of the theory. *Organizational Behavior and Human Performance*.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2013). Multivariate data analysis (7th ed.). *London: Pearson Education Limited*.
- Harpine, E. C. (2015). *Group-centered prevention in mental health: Theory, Training, and Practice*. Springer International Publishing.
- Hirschler-tim, T., van Langevelde-s, S., Endedijk-md, M., & Kessels-jwm, J. (2014). Supporting intrinsic motivation of knowledge workers in teams.
- Hogan, T. P., Benjamin, A., & Brezinski, K. L. (2000). Reliability methods: A note on the frequency of use of various types. *Educational and Psychological Measurement*, 60(4), 523-531.
- Yundong, H. (2015). Impact of intrinsic motivation on organizational commitment: Empirical evidences from China. *International Business and Management*, 11(3), 31-44.
- Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, 92(5), 1332.
- Jiang, Z. (2017). Proactive personality and career adaptability: The role of thriving at work. *Journal of Vocational Behavior*, 98, 85–97.
- Joo, B. K., Jeung, C. W., & Yoon, H. J. (2010). Investigating the influences of core self-evaluations, job autonomy, and intrinsic motivation on in-role job performance. *Human Resource Development Quarterly*, 21(4), 353-371.
- Jyoti, A., & Sharma, D. (2006). Neuroprotective role of Bacopa monniera extract against aluminum-induced oxidative stress in the hippocampus of rat brain. *Neurotoxicology*, 27(4), 451-457.
- Kaiser, H. F., & Rice, J. (1974). Little jiffy, mark IV. *Educational and Psychological Measurement*, 34(1), 111-117.
- King, L. A., Mattimore, L. K., King, D. W., & Adams, G. A. (1995). Family support inventory for workers: A new measure of perceived social support from family members. *Journal of Organizational Behavior*, 16(3), 235-258.
- Koestner, R., Otis, N., Powers, T. A., Pelletier, L., & Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal progress. *Journal of Personality*, 76(5), 1201–1229.
- Lazauskaite-Zabielske, J., Urbanaviciute, I., & Bagdziuniene, D. (2015). The role of prosocial and intrinsic motivation in employees' citizenship behaviour. *Baltic Journal of Management*, 10(3), 345-365.
- Lind, E. A., & Tyler, T. R. (2013). *The Social Psychology of Procedural Justice*. Springer Science & Business Media.
- McFarlin, D. B., & Sweeney, P. D. (1992). Distributive and procedural justice as predictors of satisfaction with personal and organizational outcomes. *Academy of Management Journal*, 35(3), 626-637.
- Menges, J. I., Tussing, D. V., Wihler, A., & Grant, A. M. (2017). When job performance is all relative: How family motivation energizes effort and compensates for intrinsic motivation. *Academy of Management Journal*, 60(2), 695-719.

- Meyer, J. P., & Herscovitch, L. (2001). Commitment in the workplace: Toward a general model. *Human Resource Management Review*, 11(3), 299-326.
- Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology*, 91(6), 1321.
- Morgeson, F. P., Delaney-Klinger, K., & Hemingway, M. A. (2005). The importance of job autonomy, cognitive ability, and job-related skill for predicting role breadth and job performance. *Journal of Applied Psychology*, 90, 399-406
- Mowday, R. T. (1991). Equity theory predictions of behavior in organizations. *Motivation and Work Behavior*, 5(2), 111-131.
- Ng, T. W., Sorensen, K. L., & Eby, L. T. (2006). Locus of control at work: a meta-analysis. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 27(8), 1057-1087.
- Nujjoo, A., & Meyer, I. (2012). The relative importance of different types of rewards for employee motivation and commitment in South Africa. *SA Journal of Human Resource Management*, 10(2), 1-10.
- Park, R., & Searcy, D. (2012). Job autonomy as a predictor of mental well-being: The moderating role of quality-competitive environment. *Journal of Business & Psychology*, 27, 305–316.
- Parker, S. K., Williams, H. M., & Turner, N. (2006). Modeling the antecedents of proactive behavior at work. *Journal of Applied Psychology*, 91(3), 636–652.
- Paterson, T. A., Luthans, F., & Jeung, W. (2014). Thriving at work: Impact of psychological capital and supervisor support. *Journal of Organizational Behavior*, 35(3), 434–446
- Peterson, R. A. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of Consumer Research*, 21(2), 381-391.
- Pfeffer, J. (1998). Seven practices of successful organizations. *California Management Review*, 40, 96–124.
- Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal research: The theory, design, and analysis of change. *Journal of Management*, 36(1), 94-120.
- Reeve, J., & Cole, S. G. (1987). Integration of affect and cognition in intrinsic motivation. *The Journal of Psychology*, 121(5), 441-449.
- Ruiz-Palomino, P., & Zoghbi-Manrique-de-Lara, P. (2020). How and when servant leaders fuel creativity: The role of servant attitude and intrinsic motivation. *International Journal of Hospitality Management*, 89, 102537.
- Russo, M., Shteigman, A., & Carmeli, A. (2016). Workplace and family support and work–life balance: Implications for individual psychological availability and energy at work. *The Journal of Positive Psychology*, 11(2), 173-188.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57(5), 749.
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52, 141–166.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57(5), 749.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68.
- Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry*, 9(1), 1-28.
- Saragih, S. (2015). The effects of job autonomy on work outcomes: Self efficacy as an intervening variable. *International Research Journal of Business Studies*, 4(3).

- Selvarajan, T. T., & Cloninger, P. A. (2012). Can performance appraisals motivate employees to improve performance? A Mexican study. *The International Journal of Human Resource Management*, 23(15), 3063-3084.
- Spreitzer, G., Sutcliffe, K., Dutton, J., Sonenshein, S., & Grant, A. M. (2005). A socially embedded model of thriving at work. *Organization Science*, 16(5), 537–549.
- Srivastava, S. K., & Barmola, K. C. (2012). Role of motivation in higher productivity. *Management Insight*, 7(1).
- Sutanto, E. M., Scheller-Sampson, J., & Mulyono, F. (2018). *Organizational Justice, Work Environment, and Motivation* (Doctoral dissertation, Petra Christian University).
- Tariq, H., & Ding, D. (2018). Why am I still doing this job? The examination of family motivation on employees' work behaviors under abusive supervision. *Personnel Review*, 47(2), 378-402.
- Thomas, K. W., & Velthouse, B. A. (1990). Cognitive elements of empowerment: An “interpretive” model of intrinsic task motivation. *Academy of Management Review*, 15(4), 666-681.
- Tyler, T., Degoey, P., & Smith, H. (1996). Understanding why the justice of group procedures matters: A test of the psychological dynamics of the group-value model. *Journal of Personality and Social Psychology*, 70(5), 913.
- Umrani, W. A., Siyal, I. A., Ahmed, U., Ali Arain, G., Sayed, H., & Umrani, S. (2020). Does family come first? Family motivation-individual's OCB assessment via self-efficacy. *Personnel Review*, 49(6), 1287-1308.
- Van Knippenberg, D., & De Cremer, D. (2008). Leadership and fairness: Taking stock and looking ahead. *European Journal of Work and Organizational Psychology*, 17(2), 173-179.
- Van Yperen, N. W., & Hagedoorn, M. (2003). Do high job demands increase intrinsic motivation or fatigue or both? The role of job control and job social support. *Academy of Management*, 46(3), 339–348
- Wang, Y., Hou, Q., Xue, Z., & Li, H. (2024). Why employees engage in proactive career behavior: Examining the role of family motivation. *Career Development International*, 29(1), 113-126.
- Williams, L. & Anderson, S. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, 7, 601-617.
- Yuan, F., & Woodman, R. W. (2010). Innovative behavior in the workplace: The role of performance and image outcome expectations. *Academy of Management Journal*, 53(2), 323–342.
- Zhu, W., May, D. R., & Avolio, B. J. (2004). The impact of ethical leadership behavior on employee outcomes: The roles of psychological empowerment and authenticity. *Journal of Leadership & Organizational Studies*, 11(1), 16-26.

Societal Trust Dynamics: Impact on Stock Market Responses to Corporate Earnings Announcements in Emerging Markets

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Abstract

Investors' responses have garnered significant interest in recent years, especially in emerging economies where shifting preferences are prevalent. Investors constantly seek valuable information to make more secure investments. As therefore, while making investment choices, investors question the reliability of the information provided by companies through corporate disclosure. This study examines the impact of societal trust, as a cultural factor and behavioral trigger, on investors' perception and utilization of information provided by corporations. As therefore, while making investment choices, investors doubt the accuracy of the information disclosed by corporate organizations. The paper utilizes event study methods to examine the average anomalous returns during the earnings announcement period in a substantial number of observations across three emerging countries: China, India, and Pakistan. The findings demonstrate a clear and meaningful correlation among trust of society trust and responses of the investor to business earnings statements. This supports the idea that societal trust plays a crucial role in shaping investors' behavior in these markets. Furthermore, the level of trust throughout society positively influences the way investors respond to company earnings statements in the emerging economies of China, Pakistan, and India.

Keywords: Corporate Earnings Announcements, Societal Trust, Culture, Investor Reaction.

Introduction

Today's investors are primarily focused on acquiring pertinent information about a company to mitigate investment risks. This emphasis on information exchange fosters effective communication between investors and corporate managers. This fact suggests that in the process of making investment decisions investors have little confidence and certainty in the information given by the firm (Ahmad & Sharif, 2023). Hence, in the field of finance, there has been considerable debate and dialogue about the reliability and accuracy of financial information in the context of research articles (Pevzner, Xie, & Xin, 2015). Another useful feature of information in financial representation which includes earnings announcements is that it offers a reliable and personal method of releasing information to many individuals through data processing. Therefore, a situation arises where there is a difference in the amount of information available to market makers and traders (Kim & Verrecchia, 1992). The investors' decisions are hindered, leading to a sense of scepticism and uncertainty. Trust, seen as the primary cultural aspect and a crucial element of social capital, is considered a behavioral incentive that facilitates favorable conditions for economic transactions. Investors, however, are the primary recipients of the information supplied by corporations and react to every new piece of information. Thus, these stakeholders need reliable and precise information to make informed and rational judgements.

The study of how stock market agents perceive and react to information, as well as the effectiveness of these methods in supplying price-related data to external investors, has been the subject of extensive academic research in the fields of accounting and finance (DeFond et al., 2007). This study aims to

investigate if the reactivity of investors to earnings releases is influenced by key national traits, in a distrustful atmosphere about the released data. This encompasses a focus on the extent of trust as a factor that influences behavior, the position of trust in society, and one of the cultural areas that impact how stakeholders react to earnings announcements - which is the most apparent aspect of social capital (Guiso et al., 2006).

In a study conducted by Zak and Knack (2001), he noted that in the societies which have higher levels of trust, the information that is disclosed by firms regarding its performance is reflected in the prices of securities in the market faster. This leads to increased investment, modernization, and thus economic growth. At the same time, corporations in countries with high levels of trust may be more incentivized to reveal sensitive information to the market given that investors' reaction can be expected to be emotionally charged and give more credence to the information disclosed. This reduces capital expenditure and contributes to improving the information culture at various businesses – an important step towards the growth of individual enterprises and achieving greater net-present value. As evidenced in the previous studies, these discourses do not provide a clear understanding of the relationship between investment, economic growth and trust (Pevzner, Xie, & Xin, 2015). Awais, Sulehri, Dar, Mohsin, and Estes (2021); Leuz et al. (2003) revealed that investors' reaction to the company earnings statements is greatly impacted on by trust. As pointed out by DeFond et al. (2007), the views of the capital market on corporate financial reporting and reporting are determined by institutions on the country-level, and country level social trust, and culture. This leads to a decrease in capital expenses and helps enhance the information culture within companies, ultimately allowing individual enterprises to achieve development and make more profitable net present-value investments. The aim of this study is to examine the differences in how investors in different countries respond to company earnings reports, with a focus on the level of trust within society, particularly in emerging nations. Emerging economies face challenges in their development, which give rise to many cultural aspects. Over time, their surroundings, culture, business methods, and markets are undergoing fast changes. Emerging markets investors are prone to behavior biases as a result of changes in their environment. These biases can lead to irrational decision-making, causing prices to diverge dramatically from their underlying values (Shleifer & Vishny, 1997).

This paper analyses the conflicting assumptions using a sample size of around 155 firm-year observations from 3 countries that reported their earnings during 2018 and 2019. This study examines investors' response to earnings announcements by measuring the average abnormal return around these announcements. Research studies that reflect this scenario include Ahmad and Sharif (2023), Guiso et al. (2008), and La Porta et al. (1997), which show that the volatility of returns after earnings disclosures rises with the accuracy and importance of disclosed information. This observation has been supported by several theories and archival studies as Bailey et al. (2006), Bamber et al. (2000), DeFond et al. (2007), Diamond and Verrecchia (1991), Harris and Raviv (1993), Kandel and Pearson (1995), Kim and Verrecchia (1991a, b, 1994), Landsman and Maydew (2002). We anticipate a positive correlation between trust and anomalous return volatility, as trust enhances the perceived reliability, precision, and significance of fresh information from the investors' standpoint. Several studies have aimed at establishing the connection between earnings release and post-release effects on the stock market. DeFond et al. (2007), Jahanshad and Eyvani (2015), and Pevzner, Xie, and Xin (2015) have advanced the knowledge by carrying out their research. In detail, these research works mainly focus on analyzing and assessing the role of formal institutions—comprising of investors' protection, insider trading legislation, disclosure and reporting standards, and earnings quality—on stock market responses to companies' earnings announcements in developed countries. In addition, Xin et al. (2015) further discuss the impact of the neutral institutional context of the country of interest on stock market reactions in developed regions.

The research gap identified here is the neglect of studying the connection between earnings announcements and stock market reactions, as well as the impact of a country's informal institutions, such as culture and societal trust, on this relationship. This neglect specifically applies to cross-country analysis, particularly in emerging economies. The literature review references the works of Ahmad and Sharif (2023), Jahanshad and Eyvani (2015), and Xin et al. (2015). The purpose of this research is to emphasize

the correlation among these concepts in the context of expanding markets, particularly in India, Pakistan, and China. Moreover, this research will enable investors to assess the dependability of organizations' earnings prior to making investment choices by comprehending the cultural trend in the market of their respective countries with regards to announcements and investments. Therefore, this study is anticipated to assist investors in making investment decisions in uncertain circumstances. This study also holds importance for future researchers, as it suggests the possibility of exploring more cultural factors to forecast their influence on stock market reactions, corporate earnings announcements, and other firm-related announcements.

The remaining parts of the paper are organized as follows: Section 2 contains information on literature review and the development of theory-based hypotheses. Section outlining the rationale for our research design and the participants involved in this study is given in section 3. Section 4 discusses the research outcomes of the study. The findings and recommendations are summarized in Section 5.

Literature Review

The research revealed that certain investors seek information prior to earnings announcements, leading to a stock market reaction before the official release date. This creates an information imbalance before the announcements (Alzahrani & Gregoriou, 2010). Corporate disclosure stimulates a greater influx of information into the market and results in price fluctuations (Kim & Verrecchia, 1992). When examining the connection between earnings announcements and stock prices (Awais, Zulfikar, Saghir, Sohail, & Rana, 2022; Kothari, 2001), it becomes evident that investors generally view accounting information as trustworthy. Prior to the scheduled earnings announcements, speculative trading increases as market participants speculate on the anticipated earnings results (Kim & Verrecchia, 1991). Trust is a crucial factor in fostering consumer commitment, leading to the establishment of client loyalty (Tabrani et al., 2018). Societal trust influences the actions of individuals in a community and can serve as an informal system to partially replace formal systems that monitor behavior (Cao et al., 2016). In countries with an unsatisfactory institutional framework, trust serves as a substitute (Abdelsalam et al., 2021). According to Realo and Allick (2009), countries with a higher level of social capital, where people can be trusted, tend to be more individualistic. Trust enhances the importance of fresh data, accuracy, and perceived trustworthiness from the perspective of investors (Pevzner, Xie, & Xin, 2015). According to Zingales (2011), modern economics believe that trust plays a pivotal role in enabling marketers to thrive and facilitating the evolution and development of advanced civilizations.

Research has demonstrated that a greater degree of trust contributes to improved social effectiveness and economic advancement. Trust is a critical element of various economic activities, such as financial evolution, corporate funding, merger and acquisitions deals (M&A), foreign business, and investment (Guiso et al., 2008). Arrow (1972) wants to point out that trust is a fundamental component of an efficiently working developed economy. Lack of trust is one of the main factors in the formation of the economy of the zone of backwardness. Based on the vast amount of literature available, it has been strongly proved that there is a strong positive relationship between the level of trust and the stock market reaction. According to Georgarakos and Pasini (2011), trust, especially when combined with sociability, can have a greater influence on people's participation in the stock market. Balloch et al. (2015) elucidate that the connection between trust, sociability, and stock market engagement is contingent upon stock market literacy and the extent of trust. Based on the results, persons who possess a deep understanding of the stock market and have complete confidence in it are more likely to allocate a greater portion of their funds towards equities. Qiu et al. (2020) conducted a study to explore the connection between social trust and stock price synchronization. Their findings indicate a favorable correlation between the two factors. According to their research, markets with high levels of society trust have a decreased probability of stock price collapses. In other words, trust is involved in ensuring that stock price changes are used to incorporate firm-specific information. Cao et al. (2016) have provided empirical evidence with regards to the proposed hypothesis that societal trust is inversely associated with stocks price crashes. Their research

shows that this effect is particularly significant for companies that receive more attention from analysts or have a large number of institutional owners.

The Efficient Market Hypothesis states that “all accessible data gets incorporated into price quotes of securities” (Marwala & Hurwitz, 2017). Earnings announcements are a primary source of such information. A vast body of work exists that confirms the robust correlation between earnings releases and the subsequent reactions in stock prices (Bouteska & Regaieg, 2017; Bizri, 2014; Kakiya et al., 2013). In the same way, Syed and Bajwa (2018) also investigated the effects on Saudi Arabian stock market announcement. They focused on quarterly announcements and discovered that the stock returns exhibited considerable abnormality in proximity to their corresponding earnings release dates. They also pointed out the fact that the effects are likely to be differential according to whether the news announcements are positive or negative. The effect of earnings announcement on the market is affected by following factors: Size of the companies, market liquidity, Transaction cost, Number of analysts who covers the company for forecasting the earnings, Risk arising out of arbitrage, Information asymmetry, and companies with institutional investors (Miao & Yeo, 2009). In the same way the extent of the impact related to the earnings releases and the stock prices also increases in the situations where the existing market sentiments are trustful. In our study, we have found that different rational investors may respond in different manners to the same information due to difference in the degree of belief with such information (Jia et al., 2015). Wei and Zhang (2014) examined the influence of trust on stock market response to earnings release using data from the United States. The research supports the idea that when there is a lack of societal trust or when trust levels are low, the stock market has a tendency to not react adequately to earnings announcements.

Eugster and Wagner (2021) found that companies with a history of low earnings experience a more pronounced market reaction to earnings announcements, based on the trust developed through their financial reporting method. Jia et al. (2015) have presented the same results, demonstrating that trust is established through cultural and social connections with the source of information. Their research emphasizes trust as a motivating factor by analyzing data from two categories of shares issued by Chinese companies: one allocated to domestic investors and another allocated to overseas investors. Moreover, through the examination of two specific categories of occurrences, namely earnings releases and financial experts' earnings estimates, the research asserts that local investors possess a significant degree of confidence in this information due to their social and cultural affiliations. Empirical testing has shown that when local analysts conduct the study, locally held shares exhibit a stronger reaction compared to stocks held by overseas investors. The findings indicated that during financial crises, enterprises lacking advanced information dissemination capabilities or facing information asymmetry risks should priorities subjective beliefs about the firms. According to the research, if investors have poor or no faith in the firms, it might lead to worries about the veracity of information. These reservations ultimately lead to a lack of response to the data presented (Jung et al., 2015).

A significant study endeavor to confirm this correlation was carried out by Pevzner et al. (2015). An analysis was conducted using a dataset of 53,000 observations of firms over a period of one year, collected from 25 different nations. This analysis was carried out so as to assess the extent to which firms are likely to be affected by trust levels on how they respond to earn announcements. This study investigated the relationship between ATV (Abnormal Trading Volume) and ARV (Abnormal Return Volatility) during the event window of (0, +1) following earnings announcements. The findings indicate that both variables exhibit a statistically significant increase in nations with higher levels of confidence. The estimation results indicated that some of these country characteristics have the significant impact on the model results when adding controls such as educational level of people, whether the country has the investor protection regulations and laws, or disclosure standards. Through the examination of the differences in various groups at a certain point in time, they additionally posited that trust can serve as a beneficial supplement to the financial system in situations where there are less established organizations or a lower percentage of literacy. Therefore, in situations where there is a significant imbalance of information, a less-educated investor may rely on faith when making financial judgements. Essentially, the research demonstrates that trust plays a pivotal role in influencing the impression of an investor of a company's financial reporting

and determining their response to earnings announcements. The research also explores the correlation between a nation's religious beliefs and the level of trust within society.

Hypothesis Development

After reviewing the literature on the role of societal trust on stock market reactions to corporate earnings announcement following hypothesis is formed:

H1: *The societal trust positively influences investors' reactions to firms' earning announcement.*

Data and Methodology

Sample Construction

The study sample comprises companies that publicly disclose their yearly earnings between July 1st, 2018 and June 30th, 2019, and are listed on reputable stock exchanges in several countries. These companies were chosen based on the criteria that they were consistently listed throughout the period from 2018 to 2019 and that data for them is accessible. Nevertheless, companies who did not make an annual earnings statement and companies that had fewer trading days throughout the estimation and sample period were not included in the sample. A study is performed on three distinct countries: China, India, and Pakistan. The sample consists of 155 enterprises that have disclosed their earnings.

Data

The availability of data is a crucial factor taken into account when choosing the sample of organizations. The duration of the study was limited due to the COVID-19 pandemic, which occurred suddenly. The potential outcomes of this event may vary (Fernandez-Perez et al., 2021), therefore, data is exclusively collected for the specified year. This event holds promise for future investigation. This study incorporates secondary sources of data. Data pertaining to stock markets, including daily closing prices, market index closing values, and earnings announcement dates, has been obtained from reputable stock exchanges such as the Pakistan Stock Exchange (PSX), Shanghai Stock Exchange (SSX), and Bombay Stock Exchange (BSE). Additionally, data on societal trust has been collected from the World Value Survey index (WVS) wave 7 (2017-2022). We collect daily stock return data within the time frame of (-160, -21), where day 0 corresponds to the date of the earnings release.

Methodology

The theoretical approach applied for this research is the event study method. In this regard, the event study method is utilized for estimating the average abnormal returns of each country by using the modified market model within the period of (-160, -21). Additionally, multiple regression analysis is utilized to assess the overall influence of social trust on reactions of the investor, as discussed by El Ghouli et al. (2023) and Yousaf et al. (2023). The predicted relationship between societal trust and stock market reactions to business profit statements is tested using the following econometric model:

$$\text{Market Reaction}_{it} = \alpha_0 + \beta_1 \text{Societal Trust}_{it} + \beta_2 \text{MKT Cap}_{it} + \beta_3 \text{Firm Age}_{it} + \epsilon_{it}$$

Where AAR is used to capture the market, reaction is explained by the level of societal trust, market capitalization and age of the firms. α and β are estimated coefficients of a regression equation and ϵ_i is the error term of the same regression equation.

Variable Definitions

Market Reaction / Reactions of Investor

The investors always respond to the information which is provided to them by these firms. To capture the reactions of investors information that was analyzed, the "basic event study approach" developed by Brown and Warner (1985) is employed. In this study, the methods of the event research approach of standard market model as explained by Mackinlay (1997) are employed to measure the impact of announcements on the market prices of stock. Some of the most appropriate measures to benchmark the investors' reaction to the earnings releases using market model event study techniques include the Average

Abnormal Return (AAR) and the Cumulative Average Abnormal Return (CAAR). The earnings announcement date is termed as the date in which sample firms release their earnings to the public. Event window is measured based on the number of days from $t = -10$ to $t = +10$, with $t = 0$ being the date of earning announcement. The analysis of the betas was done using data gathered before the event window with an observation period of 160 days. Abnormal return can be defined as the “difference between actual return and expected return”. Average Abnormal returns (AARs) are usually obtained from the sum of the modified daily returns within a certain time frame defined as the event window. More precisely, the calculation of the firm's market model adjusted returns on day t during the event window is done according to Mackinlay's (1997) methodology:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

“Where, AR_{it} = Abnormal Return of stock i on day t , R_{it} = The daily stock return of firm i on day t , R_{mt} = The daily market return of firm i 's country on day t , α_i = The firm i 's market model estimates, α_t = The firm i 's market model estimates at day t . Average abnormal returns over the event window then is computed as the mean of the market adjusted returns”.

Societal Trust

Building on existing research (e.g., La Porta et al. (1997), Guiso, Sapienza, and Zingales (2008), and Ahern et al. (2012), Ahmad and Sharif (2023), we assess social trust on the basis of questions from the WVS:

On the whole, would you assert that the majority of individuals are trustworthy or that one must use caution while interacting with others?

We derive metrics for trust and other cultural aspects by analyzing data from the World Values Surveys (WVS) wave 7, conducted between 2017 and 2022.

Control Variables

This research incorporates the subsequent control variables that have the potential to influence the stock market responses triggered by earnings announcements:

Market Capitalization

The market capitalization (MC) is the independent variable in this research. MC refers to the value of total shares of a particular company and this is obtained by the current price of the share into the total number of shares. Market capitalization is determined by taking the natural logarithm of the formula that follows:

$$\text{Market Capitalization} = \text{Current price per share (P)} \times \text{No. of shares outstanding}$$

Firm Age

The time span, measured in years, during which a firm has been in operation from its incorporation. The age of a firm is determined using the following formula:

$$\text{Firm Age} = \text{Current year of the firm} - \text{Beginning year of the firm}$$

Empirical results

Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CAARs) of India

Table 4.1 displays the AARs and CAARs of stock market of India, along with their respective values of t-statistic and its status. Event days which range from -10 to +10 represent a total duration of 21 days.

Table 4.1: AARs and CAARs of India

DAY OF EVENT	AAR	t-STATS	OUTCOME	CAAR	t-STATS	OUTCOME
-10	-0.021	-2.753	Sig	0.037	12.554	Sig
-9	-0.012	-1.571	Insig	0.044	14.981	Sig
-8	-0.029	-3.908	Sig	0.049	16.706	Sig
-7	-0.024	-3.290	Sig	0.046	15.734	Sig
-6	-0.025	-3.439	Sig	0.048	16.316	Sig
-5	-0.016	-2.171	Sig	0.041	13.912	Sig
-4	-0.027	-3.672	Sig	0.032	10.779	Sig
-3	-0.031	-4.249	Sig	0.040	13.712	Sig
-2	-0.012	-1.672	Insig	0.042	14.382	Sig
-1	-0.013	-1.825	Insig	0.032	10.950	Sig
0	-0.006	-0.824	Insig	0.042	14.260	Sig
1	-0.012	-1.649	Insig	0.030	10.198	Sig
2	-0.027	-3.651	Sig	0.017	5.735	Sig
3	-0.024	-3.221	Sig	0.012	4.033	Sig
4	-0.024	-3.256	Sig	0.008	2.781	Sig
5	-0.035	-4.750	Sig	0.000	-0.006	Insig
6	-0.016	-2.184	Sig	-0.003	-1.139	Insig
7	-0.024	-3.245	Sig	0.001	0.261	Insig
8	-0.014	-1.951	Insig	-0.005	-1.757	Insig
9	-0.023	-3.159	Sig	-0.004	-1.273	Insig
10	-0.019	-2.596	Sig	-0.004	-1.359	Insig

Note: sig represents “significant”, insig represents “insignificant”

The Average Abnormal Returns (AARs) of India

Table 4.1 displays an outcome for the stock market of India. The AARs exhibit a consistent pattern over the whole event timeframe. According to the data, the returns are consistently negative and statistically significant both before and after the announcement day, with the exception of days -1, -2, and -9. The returns show statistical insignificance even on the day of the earnings announcement, as they are negative. This implies that the event has no implication to the returns for any stock at any time prior to the event announcement, the event period and after the event period. To support this criterion, there is Fama (1965) in his concept of the efficient market theory. Thus, India is categorized as a semi-strong form efficient market, implying that share prices incorporate all available information and no extra information can earn a risk-adjusted return that would be superior to the general performance of the market. Thus, there is a negligible impact on returns on the day of the market announcement.

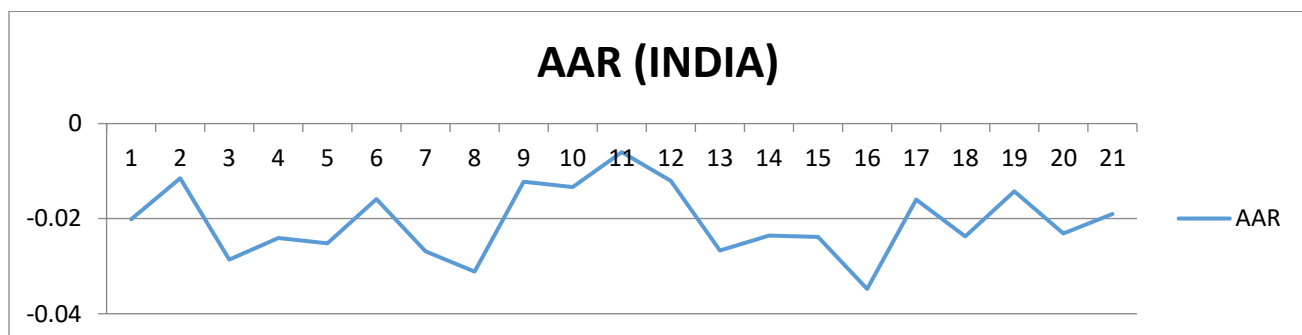


Figure 4.1: The Average Abnormal Returns of Stock market of India

Figure 4.1 displays the return distribution from the Bombay Stock Exchange during the whole window duration. No notable pattern in securities prices has been detected on the day of earning announcement. The decline in returns immediately following the release day implies a substantial and adverse effect of

the event on returns. This suggests that both before and after the earnings announcement, this market experiences predominantly strong and negative impacts.

The Cumulative Average Abnormal Returns (CAARs) of India

The CAARs shows a positive and significant influence on the returns that were recorded on the day of the announcement. The post-announcement returns are largely inconsequential, which is further bolstered by efficient market theory in its semi-strong form. This theory suggests that there is no unequal access to information, therefore indicating that the Indian market is not significantly affected by earnings announcements. Prior to the results announcement period, there is a noticeable and meaningful occurrence of favorable market reactions.

Average Abnormal Returns and Cumulative Average Abnormal Returns of Pakistan

Table 4.2 displays the AARs and CAARs of the Pakistani stock market, along with their respective values of t-statistic and its status. The day of events range from 10 days before to 10 days after, resulting in a total window duration of 21 days.

Table 4.2: AARs and CAARs of Pakistan

Day of event	AAR	t-STATS	Outcome	CAAR	t-STATS	Outcome
-10	-0.008	-0.189	Insig	-0.008	-0.189	Insig
-9	-0.012	-0.272	Insig	-0.020	-0.461	Insig
-8	-0.621	-14.298	Sig	-0.641	-14.760	Sig
-7	-0.007	-0.158	Insig	-0.649	-14.918	Sig
-6	-0.008	-0.183	Insig	-0.657	-15.101	Sig
-5	0.615	14.155	Sig	-0.043	-0.947	Insig
-4	-0.003	-0.066	Insig	-0.045	-1.012	Insig
-3	-0.013	-0.299	Insig	-0.057	-1.311	Insig
-2	-0.625	-14.393	Sig	-0.682	-15.705	Sig
-1	-0.018	-0.410	Insig	-0.700	-16.115	Sig
0	-0.016	-0.376	Insig	-0.716	-16.490	Sig
1	0.603	13.887	Sig	-0.113	-2.603	Sig
2	-0.001	-0.018	Insig	-0.121	-2.621	Sig
3	0.005	0.114	Insig	-0.109	-2.507	Sig
4	-0.618	-14.214	Sig	-0.726	-16.721	Sig
5	0.002	0.057	Insig	-0.724	-16.664	Sig
6	-0.012	-0.282	Insig	-0.736	-16.946	Sig
7	0.612	14.080	Sig	-0.125	-2.866	Sig
8	-0.002	-0.053	Insig	-0.127	-2.919	Sig
9	0.005	0.122	Insig	-0.122	-2.797	Sig
10	-0.612	-14.095	Sig	-0.734	-16.892	Sig

Note: sig represents “significant”, insig represents “insignificant”

Average Abnormal Returns (AARs) of Pakistan

The findings for the Pakistan market are displayed in Table 4.2. Analysis of AARs reveals a consistent pattern of behavior over the whole duration of the event window. The findings clearly suggest the minimal fluctuations in the returns throughout an entire window duration, encompassing both the pre and the post-

event days. Returns on days before the event, t-1, t-3, t-4, t-6, t-7, t-9, and t-10 are insignificant statistically, with days having the largest negative values. However, on day t-5, returns are statistically significant and have a positive value. Following the announcement, the day of return exhibits the same behavior as it did in the days preceding the event.

Following the announcement, the returns display a combination of positive and negative values on days t+2, t+3, t+5, t+6, t+8, and t+9. However, on days t+1, t+4, t+7, and t+10, these returns show substantial values with both positive and negative trends. Even on a particular event day, the returns are both negative and small. The consistent pattern of returns observed in the Pakistan stock market demonstrates that it operates as a semi-strong form efficient market. This finding aligns with Fama's (1965) idea of efficient market theory, which strongly supports the condition of average abnormal returns. A higher level of insignificance indicates that the event had no impact on the investor's choice. Furthermore, there was no information asymmetry related to the event that would have allowed investors to outperform the broader market.

Figure 4.2 depicts the performance of the Pakistan stock market returns over a specific time period. The returns follow the pattern both before, and after the day of announcement, and it validates a notion that an event does not have any effect on returns before or after the event. To a large extent, this pattern implies that there is no substantial market effect before or after the earnings announcement.

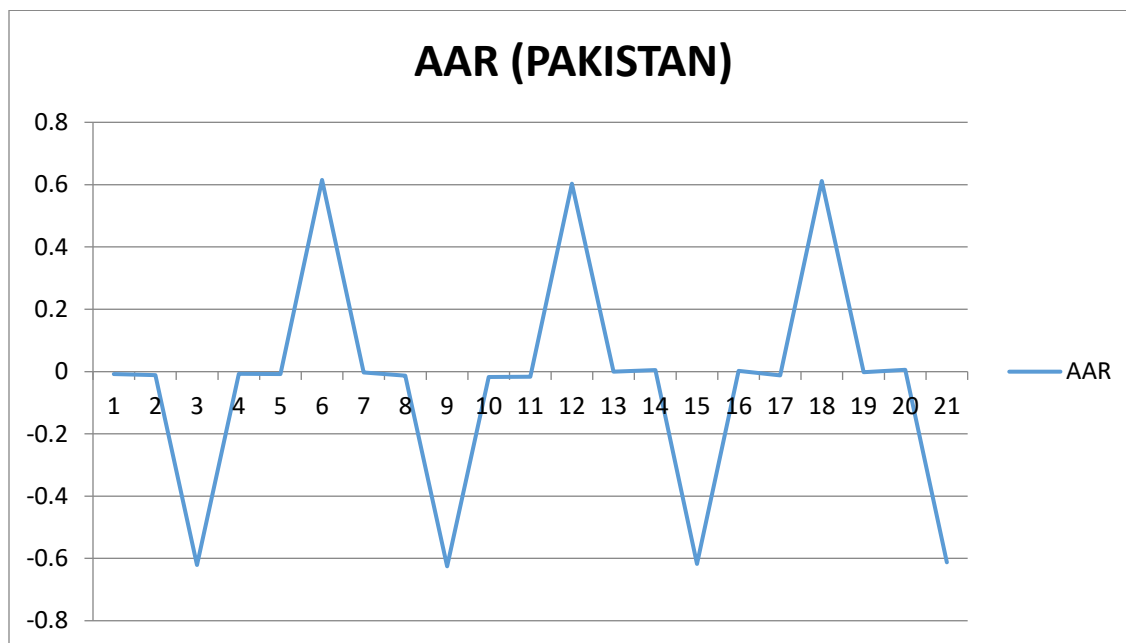


Figure 4.2: Average Abnormal Returns of Pakistan Stock Market

Cumulative Average Abnormal Returns (CAARs) of Pakistan

The trends toward the cumulative average abnormal returns are apparent and relatively steady during the entire observation period. Before the announcement of the event, which is on t-3, t-4, t-5, t-9, and t-10, the returns are either insignificant or they are negative. However, in the case of behavior of returns on the event day, all the returns behave differently from the rest period; characterized by negative returns. Still, we have noted that on a certain day, specifically at day 0, AARs are pointing to a significant and negative impact. It is such a form of returns that make the market to be semi-strong form efficient as it contains all the relevant information on the occurrence. The sources of such information are easily accessible to assist investors to achieve better results than the overall market performance index.

Average Abnormal Returns and Cumulative Average Abnormal Returns of China

Table 4.3 displays the AARs and CAARs of stock market of China, along with their respective values of t-statistic and its status. The day of event range from -10 to +10, encompassing a total window time of 21 days.

Table 4.3: AARs and CAARs of China

Day of event	AAR	t-STATS	Outcome	CAAR	t-STATS	Outcome
-10	-0.345	-2.712	Sig	7.834	5.450	Sig
-9	-1.874	-15.343	Sig	6.846	6.229	Sig
-8	1.580	5.554	Sig	-1.257	-1.863	Insig
-7	-0.121	-0.000	Insig	-5.669	-4.940	Sig
-6	1.847	12.376	Sig	-1.063	-3.126	Sig
-5	-1.613	-10.430	Sig	-21.230	-2.942	Sig
-4	0.637	2.160	Sig	-0.757	-3.055	Sig
-3	-0.542	-3.023	Sig	-4.384	-4.221	Sig
-2	0.529	1.245	Insig	-4.014	-7.058	Sig
-1	0.549	2.123	Sig	3.059	6.859	Sig
0	-0.212	-3.151	Sig	0.810	2.965	Sig
1	0.527	3.057	Sig	2.759	2.561	Sig
2	-1.020	-16.644	Sig	6.555	6.974	Sig
3	1.121	17.362	Sig	4.222	5.133	Sig
4	-0.967	-15.669	Sig	4.957	4.754	Sig
5	-0.212	-3.171	Sig	4.523	4.162	Sig
6	-0.287	-3.979	Sig	1.426	5.932	Sig
7	0.597	3.087	Sig	6.212	3.460	Sig
8	-0.345	-2.772	Sig	10.889	10.250	Sig
9	-0.385	-1.445	Insig	2.650	4.937	Sig
10	-0.120	-0.714	Insig	0.354	2.526	Sig

Average Abnormal Returns (AARs) of China

Table 4.3 displays the outcomes of the stock market of China. The nature of the actual and expected returns and the market returns for this particular market have an erratic pattern of average abnormal returns for the whole observation period. Of the AARs to be collected during the pre-event days t-1 to t-10, the AARs represent cognitive significance for a total of eight days and lack statistical importance for the following two days. The AARs used in this study are higher than zero and statistically significant using data collected during days t-1, t-4, t-6, and t-8. Besides, for days t-3, t-5, t-9 and t-10 which are above mentioned, the different is significant in term of t-ratio but in negative value. The AARs are not meaningful for the rest two time points, t-2 and t-7. The magnitude of daily returns is positive and significant statistically not only after the day of the incident (day “0”), but on this particular day as well. Post-event the (AARs) display the significant values. In this case, the AARs have been found to be statistically significant when calculated over the period t+1 to t+8. In particular, for t+1, t+3, and t+7, the presented values in AARs are positive and significantly high. However, at period t+2, t+4, t+5, t+6, and t+8 returns have negative values that are quite substantial. During days t+9 and t+10, the AARs are both negative and statistically insignificant. Over a span of 21 days, the observed pattern of AARs in the Chinese market indicates that the market is weak form efficient. This conclusion is confirmed by the Fama principle (1965). A higher

importance level following the announcement day indicates that there may have been a release of information prior to the event, which assisted investors in achieving a performance level higher than that of the overall market.

Figure 4.3 displays the distribution of returns for the stock market of China throughout the specified event window duration. The returns demonstrate an instantaneous upward trend following the occurrence, which indicates that the earnings release has a greater impact on the returns of the market.

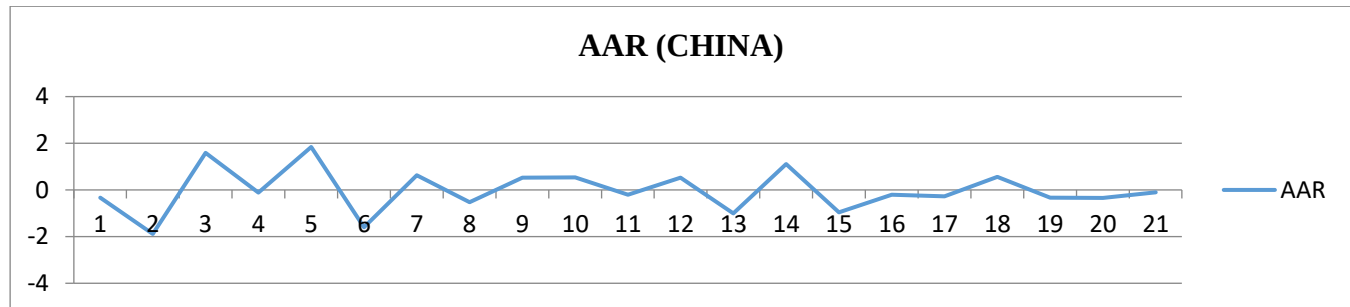


Figure 4.3: Average Abnormal Returns of Stock Market of China

Cumulative Average Abnormal Returns (CAARs) of China

These market's overall average of abnormal returns presents the strongest and significant positive results both prior to and after the event. During the nine days leading up to the event, returns are substantial, but on the actual event day, they appear to be negligible. In particular, return is positive and statistically significant at t-1, t-9 and t-10. When it comes to the returns on t-2, t-3, t-4, t-5, t-6, and t-7 days, they are statistically significant but negative in value. During the eighth day prior to the current time point (t-8), the returns exhibit a lack of significance and are characterized by negative values. The results of the returns are positive and statistically significant on day "0".

The influence of the event appears to be particularly significant in the days following its occurrence. The results for the period ranging from day t+1 to t+10 are positive and statistically significant. It also shows that AARs behave in a way that supports the event influence, and thereby proves the importance of the pre-event information asymmetry in the Chinese market to integrate with investors which boosts their performance to a considerable extent. However, on the basis of the evidence presented in this paper, it can be reasonably argued that this particular market represents a weak form efficient market.

Summary Statistics

Table 4.4 presents the mean, maximum, minimum, and standard deviation values for both the dependent variable and all explanatory variables in the current investigation. The dependent variable in this study is the average abnormal returns (AAR), whereas the independent variable is Trust. The control variables, Firm age and Market cap (market capitalization), are also taken into consideration. The sample size for this study is N = 155.

Table 4.4: Descriptive Statistics

	AAR	Trust	Firm Age	MKT CAP
Mean	0.972	27.87	39 years	\$2.70B
Maximum	3.82	49.50	80 years	\$9.81B
Minimum	-17.56	1.37	11 years	\$0.08B
Std. Dev.	0.187	15.89	26.2	1.26

Table 4.4 provides a summary of key statistics for AARs, trust, firm age, and the capitalization of market. The average AARs are reported at 0.972 with a standard deviation of 0.187. The AARs range from a value of high of 3.82 to a low of -17.56. Trust levels show an average mean value of 27.87 and a standard

deviation of 15.89, having a maximum recorded value of 49.50 and a minimum value of 1.37. Firms have an average age of 39 years, with a standard deviation of 26.2 years which spans from a minimum of 11 years to a maximum of 80 years. Market capitalization averages to \$2.70B, with a standard deviation of 1.26. The highest market capitalization is reported as \$9.81B, while the lowest is \$0.08B.

Correlation Analysis

The hypothesis test results supported the research arguments that there was a high positive relation between the predictor and predicting variables and these were assessed using the Pearson's correlation coefficients whose outcomes are presented in Table 4.5. The dependent variable that is to be used in is AARs, while the independent variable to be used in the study is Trust. Market capitalization and firm age are included within the list of control variables. The Pearson's correlation coefficients are presented in the table below the diagonal.

Table 4.5: Correlation Coefficient Analysis

	AAR	Trust	Firm Age	MKT CAP
AAR	1.00			
Trust	0.47	1.00		
Firm Age	0.15	0.46	1.00	
MRKT CAP	0.19	-0.04	-0.16	1.00

This Table 4.5 shows the regression between all the variables looked at in the current study. Following are the conclusion derived on the basis of above results that the relationship between AARs and the related study variables, such as trust, market capitalization, and business age, is not proven to be statistically significant. It is evident that there is a high degree of multicollinearity among these variables.

Regression Analysis

Table 4.6: Model 1 (Regression analysis market reactions (AARs) and Societal Trust and control variables Market capitalization & firm age)

Table 4.6 is a summary of the findings from a multivariate regression analysis of Equation (1). The analysis examines the relationship between the predicting variable, AARs, and the independent variable, Trust (Societal Trust), while controlling for two additional variables: market capitalization (Mkt Cap) and firm age (FA). The total number of observations included is 155.

Table 4.6: Multivariate Regression Analysis

Variable	Coefficient	Standard error	t-Stats	Probability
Trust	0.289	0.027	7.445	0.00
Firm Age	3.923	0.778	5.156	0.00
MKT CAP	1.665	4.798	3.490	0.00
R²	0.287	F-statistic	27.774	
Adjusted R²	0.243	Prob. (F-statistic)	0.000	
Durbin-Watson	1.878			

Table 4.6 shows the results of using multivariate regression analysis in which societal trust was used as independent variable and average abnormal return as the predicting variable. The regression analysis control variables are the size of the market, which is measured by the market capitalization of listed companies, and the age of the market. The result indicate that social trust exercises a favorable and significant influence over investor's response. The coefficient of trust has a value of 0.289, having a t statistic of 7.445 and a level of significance is found to be (0.00). These data suggest that the level of trust enhances reaction of an investor to the earnings signals and confirm the notion that investors in these emerging, developing economies place greater trust in firms' reporting (corporate disclosure).

Regarding control variables, it has been determined that both capitalization of market and age of firm have a statistically significant and positive correlation with reaction of investor. The coefficient value for market capitalization is 1.665, while the coefficient value for firm age is 3.923. Both of these variables are statistically significant, with a market cap statistic value of 3.490 and a firm age statistic value of 5.156. The positive correlation between market reaction and the average age of firms in these specific markets indicates that these companies are considered mature, with a well-defined corporate structure and a stable stage of development. Their high rating and perceived accuracy of information make them credible to investors. Consequently, markets with older firms tend to experience stronger investor reactions to these events.

Regarding market capitalization, high cap companies are perceived as having a safer and more stable reputation compared to small size stocks. These results indicate that marketplaces where organizations have significant market capitalization stocks are deemed stable in terms of their reputation and the information they provide. As a result, fresh information has a stronger impact on investor reactions. The model demonstrates a 27.7% level of support in representing the behaviors of variables that imply a stronger investor reaction in the presence of the independent variable trust, as well as the control variables market capitalization and business age. The statistical significance of the F-statistics indicates that the model is a suitable fit for the independent variables. The Durbin-Watson statistic is 1.878, indicating the absence of autocorrelation in the given data.

Discussion

The significance of corporate disclosure has been emphasized in finance literature. These disclosures offer investors valuable and pertinent information to make informed judgements. Earning announcements are regarded as crucial information that serves as a primary means of communication between a company's insiders and external investors. Earnings releases give valuable information that allows some investors to make more informed decisions about a firm's performance compared to other firms (Pevzner, Xie, & Xin, 2015). The response of investors to earnings announcements is influenced by various elements, with trust being the most significant one. Societal trust, which is a prominent feature of social capital and a significant cultural aspect, is regarded as a behavioral incentive for investors' response to earnings releases (Jahanshad & Eyvani, 2015).

The study findings indicate a favorable correlation between society trust and investor response to earnings releases in the emerging economies of China, India, and Pakistan. society trust also plays a significant influence in investor decision-making. The results align with the research conducted by Ahmad and Sharif (2023) and Pevzner, Xie, and Xin (2015). These studies indicate that social trust influences how investors respond to company earnings announcements and can serve as a substitute in situations where there is a lack of trust in the environment, specifically in Pakistan, India, and China. These changes in different sections of a group are consistent with earlier findings and past literature regarding mutual trust as the fundamental type of social capital, which underlies future commitments and expectations. Thus, if the relationship between parties is trusting, there will be a positive expectation from both sides, communication lines will be open, and more particularly there will be manifestation of norms of interaction that depict acceptable social behavior (Coleman, 1988). Hence, this study demonstrates the significance of public trust in influencing investors' decisions and highlights a more pronounced investor response to earning announcements. In terms of control variables, the analysis reveals a favorable correlation between firm age and market capitalization on all of these stock exchanges and investors' reactions. Investors tend to have a more significant reaction to older and reputable companies. Societal trust has a greater impact on investor response to corporate earnings statements when considering market size and business age.

One plausible explanation is that investors are more certain in their judgment of established and recognized firms as opposed to relatively young and low-Valuation firms. This is because older firms are in the maturity stage, established firms, and the investors would have a positive attitude towards such firms. Such kind of firms is attributed to the class of mature firm and their moves are perceived as mature

and coherent. Younger firms on the other hand are at the growth stage of their life cycle and their choice is not valued as much as that of older firms by investors. Therefore, older and reputable firms have a greater influence on investors' reactions. These findings align with the research conducted by Sare and Esumanba (2013), which suggests that older and larger capital firms are perceived as more trustworthy by investors compared to younger and smaller organizations. As a result, they tend to elicit stronger reactions from investors. The findings corroborated the favorable influence of society trust on stock market responses to business earnings statements, hence supporting the hypothesis of this study. The model's fitness in this analysis aligns with the previous work conducted by Jahanshad and Eyvani (2015) and is also similar with the findings of Sare and Esumanba (2013).

Conclusion

This research examines the influence of national culture on investor perception and the use of financial transparency by corporations. In this study, earnings releases are regarded as valuable and significant information among all the financial disclosures made by corporations. This research specifically examines the influence of social trust on the stock market response to business earnings statements in three rising markets: China, India, and Pakistan. The study examines the idea that social trust has a favorable impact on investors' responses to business earnings statements. This study examines the average anomalous returns during the earnings announcements period in developing markets to evaluate the hypothesis.

The study discovered a favorable impact of societal trust on the response of investors to business earnings statements. Investors in China, India, and Pakistan consider the firm's financial disclosure, particularly earnings announcements, to be more reliable. As a result, they react more significantly to these announcements in the markets. The impact of social trust on response of an investor to earnings announcements is stronger in countries with matured and large-cap enterprises. These findings align more closely with previous theoretical and empirical research, indicating that social trust significantly influences investors' decision-making.

Therefore, according to the evidence presented in the study, the reaction of capital markets to corporate CFD particularly earnings announcements is explained not only by formal country level institutions but cultural influences like national societal trust. Therefore, this study asserts that the level of trust within a society has a significant impact on how investors respond to company earnings reports in the rising economies of China, India, and Pakistan.

This study offers significant suggestions for future research in various areas, such as other events similar to Covid-19, different emerging markets or regions, cultural norms, corporate disclosures, and alternative statistical models like factor models, market models, and constant mean return models.

References

- Abdullah, H., & Valentine, B. (2009). Fundamental and Ethics Theories of Corporate Governance. *Middle Eastern Finance and Economics*, 4, 88-96.
- Acker, D. (2002). Implied standard deviations and post-earnings announcement volatility. *Journal of Business Finance & Accounting*, 29(3&4), 429-456.
- Affleck, G. J., Callahan, C. M., & Chipalkatti, N. (2002). Earnings predictability, information asymmetry and market liquidity. *Journal of Accounting Research*, 40(3), 561-583.
- Afzal, M., & Sehrish, S. (2011). Ownership Structure, Board Composition and Dividend Policy in Pakistan. *International Conference on Management, Business Ethics and Economics (ICMBEE)*. Held on December 28- 29, at Pearl-Continental Hotel Lahore, Pakistan.
- Ahmed Q. N., & Sharif, S. (2023). Who gets believed? Trust and Investors Reactions to Corporate Earnings Announcements in Shariah-Compliant Vs Shariah Non-Compliant. *ISRA International Journal of Islamic Finance (IJIF)*, 15(1) pp. 4-21
- Alzahrani, A. A., & Gregoriou, A. (2010). What Happens Around Earning Announcements? An Investigation of Information Asymmetry and Trading Activity in the Saudi Market. *Economics and Finance Working Paper Series*, 10(1), 19-35.

- Amir, E., & Lev, B. (1996). Value-relevance of nonfinancial information: the wireless communications industry. *Journal of Accounting and Economics*, 22, 3–30.
- Awais, M., Sulehri, N. A., Dar, I. B., Mohsin, M., & Estes, J. (2021). Antecedents of Optimism Bias of Investors in the Stock Market of Pakistan along with the Scale Development of Optimism Bias. *Academy of Strategic Management Journal*, 20(3), 1-35.
- Awais, M., Zulfiqar, B., Saghir, R., Sohail, A., & Rana, A. U. R. (2022). Psychological Indicator (s) in Stock Activities considering SDGs: The Wealth Maximization Criteria of Investors and Growth of Economy. *NICE Research Journal*, 47-60.
- Baker, M., & Stein, J. C. (2004). Market liquidity as a sentiment indicator. *Journal of Financial Markets*, 7(3), 271-299.
- Balsam, S., Krishnan, J., & Yang, J. (2003). Auditor industry specialization and earnings quality. *Auditing: Journal of Practice and Theory*, 22, 71–97.
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of Finance*, 49, 307–345.
- Barth, M. E., & Hutton, A. P. (2000). Information intermediaries and the pricing of accruals. *Working Paper, Stanford University, Stanford, CA*.
- Beaver, W. H. (1968). The information content of annual earnings announcements. *Journal of Accounting Research*, 6(3), 67-92.
- Begley, J., & Fischer P. E. (1998). Is there Information in an Earnings Announcement Delay? *Review of Accounting Studies*, 3, 347–363.
- Berkman, H., Dimitrov, V., Jain, P. C., Koch, P. D., & Tice, S. (2009). Sell on the news: Differences of opinion, short-sales constraints and returns around earnings announcements. *Journal of Financial Economics*, 9(3), 376-399.
- Bourdieu, P. (1983). *Handbook of Theory and Research for the Sociology of Education*, Forms of Capital ‘in J. Richardsons (ed.), Greenwood, New York.
- Chan, H. S., Martin, J. D., & Keinsinger, J. W. (1990). Corporate research and development expenditures and share value. *Journal of Financial Economics*, 26, 255-276.
- Choi, S. K., & Jeter, D. C. (1992). The effects of qualified audit opinions on earnings response coefficients. *Journal of Accounting and Economics*, 15, 229–248.
- Coleman, J. (1990). *Foundations of Social Theory*. Cambridge, Mass: Harvard University Press.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *The American Journal of Sociology*, 94, S95-S120.
- Daily, C. M., Dalton, D. R., & Canella, A. A. (2003). Corporate Governance: Decades of Dialogue and Data. *Academy of Management Review*, 28(3), 371-382.
- Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50, 344–401.
- DeFond, M., & Park, C. (2001). The reversal of abnormal accruals and the market valuation of earnings surprises. *The Accounting Review*, 76, 375–404.
- DeFond, M., Hung, M., & Trezevant, R. (2007). Investor protection and the information content of annual earnings announcements: international evidence. *Journal of Accounting and Economics*, 43, 37–67.
- Dopuch, N., Holthausen, R., & Leftwich, R. (1986). Abnormal stock returns associated with media disclosures of ‘subject to’ qualified audit opinions. *Journal of Accounting and Economics*, 8, 93–118.
- Edwards, B., & Foley, M. (1999). Is it time to disinvest in social capital? *Journal of Public Policy*, 19, 141-173.
- Edwards, B., Foley, M., & Diani, M. (2001). *Beyond Tocqueville: Civil Society and the Social Capital Debate in Comparative Perspective*. University Press of New England.
- El Ghouli, S., Guedhami, O., Mansi, S. A., & Sy, O. (2023). Event studies in international finance research. *Journal of International Business Studies*, 54(2), 344-364.
- Eugster, F., & Wagner, F., (2021). Earning investor Trust: The role of Past Earning Management. *Journal of Business Finance Accounting*, 48, 269-307

- Fama, E. F. (1965). The Behavior of Stock Market Prices. *Journal of business*, 38, 34-105.
- Fernandez-Perez, A., Gilbert, A., Indriawan, I., & Nguyen, N. H. (2021). COVID-19 pandemic and stock market response: A culture effect. *Journal of behavioral and experimental finance*, 29, 100454.
- Francis, J., Schipper, K., & Vincent, L. (2005). Earnings and dividend informativeness when cash flow rights are separated from voting rights. *Journal of Accounting and Economics*, 39, 329–360.
- Frazzini, A., & Lamont, O. A. (2007). The earnings announcement premium and trading volume. *NBER working paper*.
- Frieder, L. (2008). Investor and price response to patterns in earnings surprises. *Journal of Financial Markets*, 11, 259–283.
- Gambetta, D. (1988). Can we trust trust? In: Gambetta, D. (Ed.), *Trust: Making and breaking cooperative relations*, Blackwell, New York, 213–237.
- Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic Perspectives*, 20, 23–48.
- Guiso, L., Sapienza, P., & Zingales, L. (2008a). Social capital as good culture. *Journal of the European Economic Association*, 6, 295–320.
- Guiso, L., Sapienza, P., & Zingales, L. (2008b). Trusting the stock market. *Journal of Finance*, 63, 2557–2600.
- Guiso, L., Sapienza, P., & Zingales, L. (2009). Cultural biases in economic exchange. *Quarterly Journal of Economics*, 124, 1095–1131.
- Guiso, L., Sapienza, P., & Zingales, L. (2010). Civic capital as the missing link. In: Benhabib, J., Jackson, M., Bisin, A. (Eds.), *Hand book of Social Economics*, North-Holland, Amsterdam, 1A, 417–480.
- Hand, J., Holthausen, R., & Leftwich, R. (1992). The effect of bond rating agency announcements on bond and stock prices. *The Journal of Finance*, 47, 733–753.
- Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, 31, 405–440.
- Jahanshad, A., & Eyvani, J. (2015). The role of social trust on the reaction of investors regarding stock earnings announcement and the effect of disclosure quality on its relationship. *Journal of Scientific Research and Development*, 2(7), 28-34.
- Kim, O., & Verrecchia, E. R. (1992). Market liquidity and volume around earnings announcements. *Journal of Accounting and Economics*, 17(1), 41-67.
- Kim, O., & Verrecchia, R. E. (1991). Market reaction to anticipated announcements. *Journal of Financial Economics*, 30(2), 273-309.
- Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics*, 31(1-3), 105–231.
- Krinsky, I., & Lee, J. (1996). Earnings announcements and the components of the bid-ask spread. *Journal of Finance*, 51, 1523-1535.
- Leuz, C., Nanda, V., & Wysocki, P. (2003). Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, 69, 505–527.
- Libby, R., & Tan, H. (1999). Analysts' reactions to warnings of negative earnings surprises. *Journal of Accounting Research*, 37, 415–435.
- Mackinlay, A. C. (1997). Event studies in Economics and Finance. *Journal of Economic Literature*, 35(1), 12-39.
- Mahajan, V., & Banga, K. (2006). *The 86 percent solution: How to succeed in the biggest market opportunity of the next 50 years*. Upper saddle river, NJ: Wharton school publishing, Pearson Education.
- Palmrose, Z. V., Richardson, V. J., & Scholz, S. (2004). Determinants of market reactions to restatement announcements. *Journal of Accounting and Economics*, 37, 59-89.
- Pevzner, N., Xie, F., & Xin, X. (2015). When firms talk, do investors listen? The role of trust in stock market reactions to corporate earnings announcements. *Journal of Financial Economics*, 117, 190–223.

- Putnam, R. D. (1995). Bowling alone: America's Declining Social Capital. *Journal of Democracy*, 6(1), 65-78.
- Qiu, B., Yu, J. & Zhang, K. (2020), 'Trust and stock price synchronicity: evidence from China', *Journal of Business Ethics*, 167(1), pp. 97-109.
- Realo, A., & Allik, J. (2009). On the relationship between social capital and individualism-collectivism. *Social and Personality Psychology Compass*, 3(6), 871-886.
- Rogers, J., & Stocken, P. (2005). Credibility of management forecasts. *Accounting Review*, 80, 1233-1260.
- Sare, Y., & Esumanba, S. (2013). Determinants of abnormal returns on the Ghana stock exchange. *Journal of finance and accounting*, 4(11), 7-17.
- Shleifer, A., & Vishny, R. W. (1997). The limits of arbitrage. *The Journal of Finance*, 52(1), 35-55.
- Su, D. (2003). Stock price reactions to earnings announcements: evidence from Chinese markets. *Review of Financial Economics*, 12, 271-286.
- Waymire, G. (1984). Additional evidence on the information content of management earnings forecasts. *Journal of Accounting Research*, 22, 703-719.
- Yousaf, I., Riaz, Y., & Goodell, J. W. (2023). What do responses of financial markets to the collapse of FTX say about investor interest in cryptocurrencies? Event-study evidence. *Finance Research Letters*, 53, 103661.
- Zak, P., & Knack, S. (2001). Trust and growth. *Economic Journal*, 111, 295-321.

The Impact of Inadequate Sleep Quality on The Act of Concealing Knowledge: The Mediating Effects of Psychological Discomfort and Impaired Self-Regulation, and The Moderating Effect of Social Isolation

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Abstract

The research study presented in this paper examines the relationship between knowledge concealment and poor sleep quality, with psychological distress and self-regulatory impairment serving as mediators and occupational exclusion as a moderator. In this research, we aim to measure the following The study examines the correlation between poor sleep quality and knowledge hiding due to psychological distress and self-regulatory impairment. It also investigates the moderating role of workplace exclusion in the relationship between poor sleep quality and psychological distress, self-regulatory impairment, and knowledge hiding. Additionally, the study explores the mediating role of workplace exclusion in the relationship between poor sleep quality and knowledge hiding, as well as the relationship between workplace exclusion and self-regulatory impairment. Previous studies served as the basis for the hypothesis-based model that was then tested using SPSS and Smart PLS-SME. Out of 250 feedbacks obtained, data from 200 respondents was sifted. The validity and reliability of the data were assessed by tests. Beta and T-Values were also used to measure the impact intensity. The results show that poor sleep quality has a positive and substantial effect on knowledge concealment, with psychological discomfort and moderation of workplace exclusion mediating or moderating the relationship. Managers that want to boost their company's performance and productivity might use the study's conclusions. Because of constraints on time, money, and knowledge in the field, research results are always susceptible to inaccuracy, no matter how much time and energy is invested in them.

Keywords: Insufficient sleep, Concealment of information, Impaired self-control, Mental anguish, Exclusion from the workplace.

Introduction

Knowledge can be described as the amalgamation of understanding, moral principles, high-quality knowledge, and specific proficiency that assists in the examination and utilization of novel experiences and facts (Gammelgaard & Ritter, 2005). The ideas and actions of individuals constitute knowledge, which goes beyond just records and databases (Ismail et al., 2012). Knowledge management theory is presently a prominent topic in management and information technology literature; it emerged in response to the growing importance of

knowledge within organizations (Arias & Luis, 2013). Knowledge sharing has the potential to improve existing knowledge and generate new information (Huang, Davison, & Gu, 2008). The importance of information exchange is being recognized by an increasing number of Chinese businesses. As a result, managers have started to encourage their staff to share expertise (Huang et al., 2008). Concealing valuable knowledge, as opposed to the act of hiding, can result in significant consequences (Hecht et al., 2015). Studies have begun to document the adverse consequences of information concealing (Hecht et al., 2015). Fortune 500 firms incur an annual loss of around \$31.5 billion due to their failure to share information. According to an ongoing review conducted in the United States, 33% of the participants acknowledged concealing information (Peng, 2013). Similarly, 46 percent of participants admitted to engaging in information concealing within their organizations at least once. The source cited is Peng, 2013. Nevertheless, there are specific activities that include concealing information, and our investigation aims to determine if certain types of knowledge hiding are more detrimental than others (Demirkasimoglu, 2015). This study describes various scenarios in which individuals deliberately or inadvertently conceal information (Connelly & Zweig, 2015). This research focuses on the reasons why individuals choose to withhold their information (Peng, 2013). Knowledge hiding refers to the intentional act of concealing or withholding information that is requested by others (Černe, Hernaus, Dysvik, & Škerlavaj, 2017). It is not merely the opposite of sharing information; it implies a desire to preserve knowledge that someone else has requested. This behavior may indicate a potential for negative outcomes (Černe et al., 2017). Employees are obligated to share their expertise with their colleagues, and organizations invest in the development of knowledge sharing and appoint executives to promote this exchange (Huang et al., 2008). Many reps withhold some information. Employees may engage in the practice of “Knowledge hiding”, in which one person knowingly refuses to provide another person with information that they have asked for inside the business (Connelly & Zweig, 2015). Despite the sincere efforts of managers, many employees tend to hoard information or are reluctant to share their expertise with colleagues or superiors (Gurteen, 1999). Many organizations have provided instruction in certain activities that promote the widespread dissemination of ideas and information among members of the organization (Huang et al., 2008). Information concealment remains prevalent in contemporary work environments. Associations have implemented several initiatives to promote knowledge exchange, but the outcomes have not met or exceeded the expectations of the management (Peng, 2013). Knowledge concealment arises from various factors, including individual-level characteristics such as personality traits (Demirkasimoglu, 2015). Poor sleep quality is a condition that is often overlooked or not thoroughly studied, although it has the ability to impact knowledge concealment. Sleep appears to facilitate the “disconnected” processing and consolidation of individual memories, enhancing their potential usefulness for recalling events in the future (Sohn, Kim, Lee, & Cho, 2012). During sleep, our cognitive abilities and memories are consolidated in the brain regions that are more optimized and enduring, leading to enhanced efficiency. (Pereira, Summer, & Elfering, 2014). There is a belief that a lack of sleep may lead to the concealment of knowledge (Nunes et al., 2009). Insufficient sleep can cause individuals to exhibit sluggish, stressful, or unpleasant behavior, ultimately resulting in purposeful or inadvertent concealment of knowledge. Human beings have an inherent need for an appropriate duration of sleep in order to function well (Nunes et al., 2009). Inadequate sleep quality is associated with increased healthcare expenses, absenteeism, heightened susceptibility to mental disorders, and overall poor influence on measures of well-being (Rossini et al., 2012). One prominent concern associated with job continuity is a decrease in both the quality and quantity of sleep. Specific sleep disorders can increase the risk of depression and death. From the early 1980s onwards, moderators have been facing an increasing amount of stress in the job (Leung, Siu, & Spector, 2000). When people don't get enough good sleep, it might cause mental distress and, in the long run, cause them to keep secrets. The citation for the source is Banks, Kohn-Wood, and Spencer (2006). The quality of sleep leads to self-regulatory depletion, which in turn results in knowledge concealing (Welsh & Ordóñez, 2014). Theoretical frameworks on self-regulation may provide a novel conceptual comprehension of deceitful behavior (Welsh & Ordóñez, 2014). Workplace exclusion acts as a mediator in the link between sleep quality and psychological discomfort and self-regulatory exhaustion. Social and economic policies in Europe have made it a crucial goal to address and eliminate social exclusion (Bayram, Bilgel, & Bilgel, 2012). The European Union (EU) defines social exclusion as the process by which certain individuals are marginalized and prevented from fully participating in society due to their poverty, lack of essential skills and long-term educational opportunities, or as a result of discrimination (Bayram et al., 2012). In order to obtain an advantage

or achieve a competitive edge, businesses must establish intentional processes for generating and utilizing information. In order to assess the elements that influence knowledge concealing and mitigate negative outcomes within businesses, we are conducting tests. Initially, we enhanced our understanding of concealing written works by emphasizing the significance of the quality of sleep. Furthermore, the inclusion of two mediators to connect poor sleep quality and information concealing will enhance our comprehension of the impact of little sleep on concealing information. This study will also look at how workplace exclusion affects the correlation between bad sleep and other health problems.

Problem Statement

The research problem statement focuses on the crucial issue of comprehending the impact of inadequate sleep quality on workplace behaviors and interactions within consultancy businesses. Despite accumulating research, the precise impact of inadequate sleep on psychological discomfort, self-regulation impairment, workplace exclusion, and knowledge concealment in professional contexts remains unclear. Workplace dynamics will regulate and mitigate such correlations, while the study will also examine whether psychological distress and self-regulatory impairment play significant roles as mechanisms. This research will examine the effects of inadequate sleep quality on employee behavior and organizational effectiveness in consultancy businesses. The aim is to contribute to the understanding of how to enhance well-being and productivity in the workplace.

Research Objectives

1. The goal is to examine how psychological suffering mediates the relationship between poor sleep quality and the act of concealing knowledge.
2. The aim is to evaluate the impact of poor sleep quality on the act of hiding knowledge, specifically examining how self-regulatory impairment plays a role as a mediator.
3. The aim is to evaluate how occupational exclusion influences the connection between poor quality sleep and mental health issues.
4. The purpose of this research is to determine whether or not unemployment modifies the correlation between inadequate sleep and impaired self-regulation.
5. The goal of this research is to find out how social exclusion at work influences the correlation between not getting enough sleep and keeping secrets by looking at the moderating role of psychological discomfort.
6. This research aims to assess how workplace exclusion impacts the connection between inadequate sleep quality and the act of hiding knowledge, while taking into account the role of self-regulatory impairment as a mediator.

Literature Review

Poor Sleep Quality

The absence of a well-defined phrase arises from the widespread usage of “sleep quality” in the field of sleep medicine. Sleep measurements encompass several aspects of sleep quality, Considerations including total sleep time (TST), sleep onset latency (SOL), degree of fragmentation, total wake time, sleep efficiency, and incidences of spontaneous arousals or apneal, which are events that disrupt sleep, are included in these metrics (Krystal & Edinger, 2008). Inadequate sleep, marked by fragmented or unsatisfactory sleep, is associated with a variety of health-related problems. These factors encompass a decline in the overall well-being and financial burdens. Social and biological changes have a substantial impact on the sleep habits and inclination for risk-taking in teenagers. Obtaining adequate sleep is essential at every stage of development. In adolescence, sleep has the potential to influence cognitive and emotional performance. Insufficient sleep quality is often observed when the developmental phase is inadequate (Wickins, 2007). Emotional deficit and emotional hostility are linked to a decline in sleep quality, characterized by a tendency towards engaging in risky activities, reduced ability to focus and manage behavior, and limited emotional regulation (Telzer, Fuligni, Lieberman, & Galván, 2013). Different types of sleep have the ability to forecast significant health results. The study conducted by Duggan, Friedman, Mcdevitt, and Mednick (2014) primarily investigates the relationship between health and the length of sleep. A lack of quality sleep is associated with negative effects on mental and physical health (Crain, 2012). Furthermore,

it results in other health ailments such as bodily discomfort, migraines, and stomach difficulties. According to Å et al. (2007), there are a number of unfavourable effects linked to sleep problems. These include irreversible damage, chronic diseases, low self-rated health, emotional distress, and tension. Spiegel, Leproult, and Cauter (1999) found that poor sleep quality is associated with an increased risk of developing diabetes because it affects metabolic system function. Muscle pain and gastrointestinal problems are among the health consequences that people who have trouble sleeping have described (Å et al., 2007; Crain, 2012). Research has shown that sleep disturbances are linked to various negative outcomes, including overall deterioration of health, chronic medical conditions that cannot be cured, poor self-rated health, and increased levels of distress and tension (Å et al., 2007). Elevated sleep disorderliness presents a substantial hazard to mental well-being, as it has the potential to result in depression (Jansson, Linton, Jansson, & Linton, n.d.). There is a correlation between workers who have trouble sleeping and an increased occurrence of public health problems. There is a correlation between poor sleep quality and motor vehicle accidents (Jansson et al., n.d.). Sleep-related accidents may surpass an annual cost of \$50 billion (Leger, 2018). This expense could potentially increase by an additional \$50 billion each year as employers bear the burden of costs resulting from labor attrition related to sleep issues (Leger, 2018). Each year, the consequences of sleep-related disorder lead to healthcare expenses amounting to \$15 billion (Å et al., 2007). Sleep quality is the term used to describe the overall experience of a sleep period, including the process of falling asleep, staying asleep, the duration of sleep, and the level of contentment upon waking up (Maheshwari & Shaukat, 2019). According to the American Academy of Sleep Disorders (Grandner, 2019), it is recommended that adults sleep for a minimum of seven hours every day. Inadequate sleep quality is strongly linked to various disorders. Examples of the negative effects of this condition include less motivation, depression, difficulty sleeping, poor memory, weakened immune system, slowed cognitive and motor responses, excess body fat, metabolic disorders, an increased chance of developing cancer and heart disease. Additionally, it is linked to an elevated likelihood of work-related injuries and reduced efficiency. Obesity, cardiovascular disease, and cognitive dysfunction are just some of the health problems linked to insufficient sleep, according to studies. At the University of Gondar Comprehensive Specialised Hospital, which employed 418 healthcare staff in 2024, Tesfaye conducted a study. According to Tesfaye et al. (2024), the Pittsburgh Sleep Quality Index was used as a measurement method in the study. A disproportionately large number of participants (58.9%) reported very poor sleep quality on a regular basis. The characteristics that were shown to predict this included being female, engaging in shift work, not exercising regularly, chewing khat, and experiencing depressed symptoms. This finding highlights the necessity for frequent monitoring and interventions aimed at enhancing the sleep quality and overall good of healthcare professionals (Denison et al., 2021).

Workplace Exclusion

A number of things, including stress, gender, age, exercise, habits, and workplace characteristics might influence an individual's sleep quality. Insomnia is a common occurrence among healthcare professionals. However, the prevalence of this issue can be influenced by several factors, such as sociodemographic and vocational features (Nielsen et al., 2020). Sleep issues can lead to reduced immunity, decreased adaptability, anxiety, depression, and other mental and physical ailments (Magnavita et al., 2019). Moreover, research has established a connection between sleep disruptions and various illnesses, occupational accidents, and long-term health problems. These disturbances have been proven to affect both productivity and overall quality of life (Robbins et al., 2019). Shift work patterns are increasingly prevalent in numerous contemporary professions. According to Visvalingam et al. (2020), around 20% of the employed individuals work during nighttime or at varying shifts. Depending on the type of job, you can get things done in two eight-hour shifts that start at midnight or in three eight-hour shifts that begin at midnight. Many unpleasant emotions, including depression, social anxiety, humiliation, guilt/shame, resentment, and despair, are linked to feelings of exclusion, whether actual or imagined (Hitlan & Noel, 2009). Reductions in psychological well-being, performance, and contentment with coworkers are linked to workplace exclusion, which is characterised as the degree to which an individual feels ignored or overlooked at work, and engagement in negative behaviors such as rudeness, mockery, and withholding support (Scott, Restubog, & Zagenczyk, 2013). Exclusionary practices can manifest in several ways, such as employing the silent treatment, displaying apathetic affection, actively avoiding someone, neglecting their presence, or outright rejecting them. Based on previous authoritative and social-psychological research, workplace exclusion is defined as the act of

dismissing or ignoring an individual or group by another individual or group. This behavior hinders the person's ability to establish or maintain positive relationships, achieve success in their job, or maintain a good reputation within their workplace (Hitlan & Noel, 2009). Wang, Patterson, and Hills (2002) have discovered several theatrical notions related to exclusion in the realm of social policy research. However, there is no unanimous consensus on exclusion. Despite widespread compliance, the level of deprivation goes beyond mere details and presents a more intricate, intricate, and captivating understanding of poverty. Lucas (2012) Workplace exclusion is the absence of approval for resources, rights, goods, and services, as well as the failure to engage in customary workplace interactions and activities.

This exclusion can occur in any sector of society, whether it be economic, social, cultural, or political. The notion of workplace exclusion originated in Europe but has now become a widely accepted topic in British policy and study. The roots of this idea may be traced back to Townsend's (By, 2006) basic definition of poverty, which refers to a state of extreme destitution. When people's financial means fall below what is considered to be the bare minimum, it becomes nearly impossible for them to carry out their daily lives as they normally would. The processes by which individuals are excluded from participating in customary social responsibilities within firms are referred to as social exclusion (Kilpatrick et al., 2003). Exclusion is a multifaceted process that typically, though not always, involves poverty (Kilpatrick et al., 2003). Workplace exclusion refers to one group targeting another group in order to gain an edge, resulting in one group having more power than the other. This is also recognized as a crucial factor influencing overall well-being. Social exclusion has a detrimental impact on health as it restricts access to social resources that promote well-being (Shaw et al., 2001). Workplace exclusion is a method used to unfairly discriminate against a group by deliberately excluding them from certain activities or opportunities (Samers, 1998). The notion of "workplace exclusion" is relatively new but has garnered significant interest in research and policy investigations, surpassing concepts such as "poverty" or "deprivation" (Marsh & Mullins, n.d.). In addition, the phrase has not achieved consensus in the context of migrants and ethnic minorities, where it typically relates to the concepts of "greater integration" or "lesser integration" (inclusion or exclusion) (Samers, 1998). The term "social exclusion" is often used interchangeably with "poverty" due to political considerations. Officials, who have set a minimum income threshold to meet basic necessities, are reluctant to use the term "poverty" when referring to their country. Thus, social exclusion is depicted in a euphemistic manner, which is considered more suitable and less offensive compared to the existing term and its negative implications (Vanmontfort, Berghman, & Rombauts, 2015).

Psychological distress

Some claim that in today's culture, people often get less than adequate sleep. Many diseases and conditions are characterized by sleep disturbances, which are associated with a marked decrease in quality of life and can be used as a diagnostic tool (Freeman et al., 2020). The Diagnostic and Statistical Manual of Mental Disorders includes sleep disturbances as a diagnostic criterion due to the high prevalence of these symptoms as markers of particular mental disorders. Hombali et al. (2019) set out to fill a notable void in our understanding of the prevalence of poor sleep quality by looking into the correlation between poor sleep and mental health issues. The purpose of the study was to collect information on the frequency of poor sleep quality and its correlation with mental health issues across various age groups. The results indicated that 42.4% of respondents had poor sleep quality. In addition, individuals who were designated as poor sleepers exhibited significantly more severe psychological issues. There was a clear pattern indicating that as sleep quality declined, there was a corresponding increase in symptoms of mood disorders and anxiety. The study closes by recommending the necessity of conducting further research using objective sleep metrics to create customized health promotion programs for middle-aged individuals (Richards et al., 2020). The prevailing concepts commonly employed in relation to mental health difficulties in the workplace are psychological discomfort and depression. Psychological distress is increasingly comprehensive in its definition and assessment as it encompasses various expressions of mental imbalance described and quantified by two distinct concepts. This condition is marked by numerous psychophysiological and behavioral symptoms that are not specific to any particular disease. These symptoms include depressive and anxious reactions, irritability, cognitive decline, sleep difficulties, and absenteeism from work, among others (Durand & Marchand, 2005). Psychological distress encompasses factors such as work strain, mental exhaustion, and feelings of discouragement at work. These factors have been found

to have significant effects on work, family, and health outcomes. Examples of these outcomes include work satisfaction, conflicts between work and family life, behavior that benefits the organization, deviant behavior at work, work performance, intention to leave the job, and high blood pressure. If left untreated, psychological distress can lead to increasingly severe, reversible medical conditions such as psychosomatic ailments, arterial hypertension, severe depression, and alcohol abuse. Permanent disability, unexpected death, suicide, cardiovascular disease, and neuropsychiatric disorders are some of the irreversible harms that might develop over time. According to Durand and Marchand (2005), when people experience psychological distress, it usually means that something is wrong with their mental condition. Psychological distress is defined as an extremely unpleasant emotional condition (Mackey, Gass, & McDonough, 2019). The list of negative outcomes is long and includes things like social isolation, low self-esteem, anxiety, despair, and impatience (Poulin & Battaglini, n.d.). This result for health is more of an overall unfavorable state of mind than a diagnosis of a particular mental illness like GAD, depression, or burnout (Durand & Marchand, 2005).

Self-regulatory impairment

Currently, sleep deprivation has emerged as a prevalent concern in modern society. People often neglect the need of sleep due to their daily routines, work responsibilities, and mental pressures (Molero Jurado et al., 2019). People who have a habit of staying awake late at night generally have lower performance levels, resulting in them often lagging behind in completing a significant quantity of work. Evening hours are essential for compensating for any work schedules that were not completed (Chang & Lin, 2019). However, this can pose a challenge and result in increased sleep deprivation, which can give rise to a range of other diseases, encompassing both mental and physical sleep-related problems. Sleep is a vital physiological requirement for individuals to recuperate from the fatigue of their daily activities. Having a high standard of sleep quality is crucial for maintaining a healthy and enhanced quality of life. Inadequate sleep in individuals without sleep disorders was initially identified as a failure in self-regulation caused by poor sleep habits. As per the findings of Cavicchioli et al. (2019), self-regulation refers to a systematic process that involves conscious and intentional effort to modify behaviors with the aim of achieving a certain objective. Individuals' intents and behaviors display inconsistency when they lack the ability to exert self-restraint. Some people fail to achieve their goals because of the intention-behavior gap. Therefore, if you're having trouble sleeping, it can be an indication of a behavioral problem. An individual's behavior can be guided towards specified goals or norms through the cognitive process known as self-regulation. Several organizational tasks rely on self-regulatory processes, including psychological functioning, multitasking, subtle learning abilities, and job performance (Converse & Deshon, 2009; Porath & Bateman, 2006). Individuals are able to maintain control and direction of their behaviors in pursuit of their goals, regardless of external factors, thanks to a system of processes known as self-regulation (SR). Mind, emotion, and behavior regulation all fall under this category (Porath & Bateman, 2006). If workers participate in emotional labour, as per the depletion model, it is expected that their performance may suffer during subsequent self-regulating behavioral events due to the depletion of organizational capital (Tice, Baumeister, Shmueli, & Muraven, 2007). Self-regulation is commonly defined as the conscious and deliberate actions taken by an individual to modify their own reactions or behaviors. Psychologists have increasingly acknowledged the influence of automatic elements on human behavior (Dijksterhuis & Bargh, 2001). However, it is possible for some of our actions to be altered by our great determination. Self-regulation refers to the intentional initiation of activities, emotions, feelings, or wants by an individual (Converse & Deshon, 2009). Self-regulation frequently involves cognitive reinforcement or behavioral activation, which refers to the inhibition of innate impulses. Firstly, self-regulation encompasses actions such as getting out of bed in the morning or persevering through difficult tasks. It involves restraining certain behaviors, such as hiding under the covers, leaving, or yelling at loved ones, and consciously choosing alternative behaviors (Vohs, Faber, & Faber, 2015). Self-regulation frequently involves cognitive reinforcement or behavioral activation, which refers to the inhibition of innate impulses. Firstly, self-regulation encompasses actions such as getting out of bed in the morning or persevering through difficult tasks. It involves either restraining certain behaviors (like hiding under the covers, giving up, or lashing out at loved ones) or intentionally choosing alternative behaviors (as suggested by Muraven, 1998 and Tice et al., 2007).

Knowledge Hiding

Research on writing surveys suggests that the knowledge concealment strategy can be classified into three main categories: The three types discussed are justifiable concealment, evasive concealment, and feigning ignorance (Demirkasimoglu, 2015). Each of these strategies of concealing knowledge can be elucidated by a crucial indicator referred to as uncertainty. Factors like as uncertainty, interpersonal relationships, social exchanges, and organizational structure might influence employees' tendency to conceal knowledge (Simmel, Sozialtheorien, & Blau, 2019). The concept of knowledge concealment can be used to describe this occurrence within organizations. Knowledge hiding refers to a deliberate effort by an individual to avoid or conceal information that has been shared by someone else. When someone explicitly asks for information while the other person intentionally conceals it, a behavior of knowledge concealment takes place (Hecht et al., 2015). According to Connelly and Zweig (2015), knowledge hiding is not simply the act of not sharing information. Instead, it refers to the deliberate effort to keep or conceal information that has been disclosed by someone else. The theory of psychological ownership may provide some elucidation for why individuals conceal information. According to the psychological ownership theory (Pierce, Learmonth, Ross, & Patterson, 2004), humans have the capacity to cultivate a feeling of possession towards an object. if they have consistent control over it, invest significant time or effort into it, or are familiar with it. In addition, individuals are hesitant to reveal the purpose of their ownership to others due to the potential loss of control and negative emotions that may arise from sharing with others (Pierce et al., 2004). As individuals acquire, control, or generate information, they develop a sense of ownership over it. That is the reason why they desire to conceal or preserve it. Therefore, it is advisable to clearly identify information and its mental ownership through the practice of knowledge concealing. Connelly and Zweig (2015) have identified several antecedents of knowledge concealing, such as uncertainty, the complexity and relevance of information, and the organizational culture of information sharing. Regardless, academics have limited knowledge about the cognitive process of knowledge concealing. This study aims to further explore the relationship between information-based mental possession and knowledge concealment by examining the specific factors of how and when this influence occurs. Aladdin, Mahomed, Imam, and Hwan conduct a systematic literature review to investigate the adverse outcomes associated with knowledge concealment behavior in organizational settings (Alaydi et al., 2023). This review comprehensively integrates theoretical, methodological, and empirical aspects to thoroughly elucidate the outcomes of knowledge concealment. The results demonstrated that information concealment has adverse impacts on organizational performance and promotes a detrimental working atmosphere. While this review primarily focuses on concepts and suggests the necessity of a meta-analysis or empirical studies for a more refined framework, it significantly contributes to the literature on organizational behavior Knowledge hiding can be studied using a variety of methods, and this page gives a comprehensive overview of those methods while also pointing out which areas require more research.

H1: Workplace exclusion has a mitigating influence on the positive impact of poor sleep quality on psychological discomfort.

The relationship between sleep quality and psychological issues is still being investigated. Various researchers have discovered that when rest disorder, torment, and discomfort occur simultaneously, they are referred to as “symptom clusters” (Nishiura & Tamura, 2015). The prevalence of mental disorders among workers tends to rise when they perceive instances of unfairness or injustice in their work environment. Rupp and Cropanzano (2002) argued that individuals frequently perceive their employing businesses as autonomous social entities capable of dispensing fairness or unfairness. Thus, it is postulated that a decline in sleep quality will result in an increase in psychological discomfort, which will be influenced by workplace exclusion. Specifically, compared to individuals who do not experience workplace exclusion, People experiencing both poor sleep quality and workplace exclusion are more likely to display signs of psychological distress. This moderation effect is significant because it demonstrates the interconnectedness of individual health behaviors and the workplace environment. It highlights the cumulative risks and emphasizes the need for comprehensive interventions that address both personal and organizational factors. Available evidence confirms that comprehensive interventions are essential for mitigating the detrimental effects of sleep deprivation and job-related exclusion on mental well-being.

H2: Inadequate sleep quality has a beneficial influence on the impairment of self-regulation, with the workplace exclusion acting as a mitigating factor.

According to Vertes and Siegel (2004), getting enough rest during a nap is necessary before being able to perform well. Rest is undeniably essential for both humans and other creatures. It is a complex system of physiological cycles that induce sleep and create a need for rest throughout our lives (Vertes & Siegel, 2004). According to a poll conducted by Vertes and Siegel in 2004, it is often observed that people tend to sleep more when they are working. Rest is a prominent activity for workers. Several adverse variables hinder sleep (Barnes, 2012). Sleep patterns, including daytime sleep, have a significant Impact on procrastination (Lanaj, Johnson, & Barnes, 2014). The ability to regulate is akin to a muscle that enhances throughout sleep. Taking a daytime nap enhances the body's ability to maintain control and prevent fatigue (Kühnel, Bledow, & Feuerhahn, 2016). The study conducted by Barnes (2012) reveals that a decline in both the quality and duration of sleep has a negative impact on an individual's self-control at the job. Based on the assessments of the studies mentioned, we propose that a decline in sleep quality will lead to an increase in self-regulatory impairment, with workplace exclusion playing a moderating role. More specifically, those who suffer from both poor sleep quality and workplace exclusion are prone to displaying higher degrees of self-regulatory impairment in comparison to those who do not experience workplace exclusion. This study is grounded on the concept of workplace exclusion, as proposed by Lucas (2012) and Vanmontfort, Berghman, and Rombauts (2015), which suggests that it has a moderating influence. This idea emphasizes the essential requirement of simultaneously taking into account an individual's own sleep habits and workplace dynamics to enhance their self-regulation and overall job performance. According to the authors Magnavita et al. (2019) and Robbins et al. (2019), the relationship between these characteristics indicates that intervention methods to mitigate the adverse impact on self-regulation should focus on individual health behaviors and organizational practices.

H3: Knowledge concealing is facilitated by poor sleep quality through psychological discomfort.

Research in the field of literature confirms that there is a connection between psychological strain and poor sleep quality, which in turn leads to the occurrence of information concealment behaviors. Freeman et al. (2020) have found that sleep abnormalities can be used to predict the occurrence of other conditions, such as psychological discomfort. Hombali et al. (2019) additionally ascertain that inadequate sleep quality is a prognosticator of an elevated incidence of psychiatric issues across all age cohorts. Additionally, they observe that the group of poor sleepers is indicative of more severe psychological problems, thus suggesting a potential direct correlation between sleep quality and psychological suffering. Psychological discomfort encompasses various adverse emotional states. The mentioned symptoms encompass symptoms of anxiousness, sadness, and impatience. Psychological discomfort, according to Durand and Marchand, often impairs people's cognitive functioning and behavioral control. hence increasing the likelihood of engaging in counterproductive workplace activities such as information concealing. Connelly and Zweig explain how psychological factors, such as stress and worry, might lead individuals to deliberately conceal their knowledge. The existing literature strongly supports the idea that psychological discomfort plays a mediating role in the connection between poor sleep quality and knowledge concealment. This underscores the presence of a detrimental cascade of events that originates from the quality of sleep, subsequently impacting mental well-being, and ultimately exerting an influence on workplace behaviors.

H4: Through the intermediary of impaired self-regulation, poor sleep quality enhances knowledge concealing.

The relationship between knowledge concealment activities and self-regulatory impairment can be explained by poor sleep quality acting as a mediator. Sleep deprivation hampers self-regulation, impeding individuals' ability to manage their actions and moderate their emotional reactions. According to Cavicchioli et al. (2019), self-regulation involves consciously changing one's behavior, but this might be challenging when sleep quality is poor. The absence of self-discipline results in actions that deviate from one's intended behavior; this is known as the intention-behavior gap. This phenomenon can be observed in the professional environment through the practice of knowledge concealing, wherein an individual refrains from sharing information due to a compromised ability to regulate their own behavior. Connelly and Zweig (2015) suggest that individuals may intentionally withhold knowledge due to difficulties in self-regulation, which impede their ability to manage the cognitive and emotional aspects of sharing knowledge. This phenomenon is clearly demonstrated in the research, Due to a

strong correlation between inadequate sleep quality and the act of hiding information. The link between these two factors is facilitated by a deficiency in self-regulation, suggesting that sleep-related challenges in self-control can result in unproductive behavior's in the workplace.

H5: The relationship between poor sleep quality and knowledge concealment is indirectly influenced by workplace exclusion, with psychological distress acting as a mediator.

Work exclusion, also known as being disregarded or neglected in the professional environment, can exacerbate the adverse impact of inadequate sleep on psychological discomfort. The workplace can cause considerable psychological suffering, such as melancholy and worry, due to exclusionary behaviors, as shown by Hitlan & Noel (2009) and Scott et al. (2013). The co-occurrence of inadequate sleep quality and workplace exclusion exacerbates psychological distress. Moreover, increased psychological distress can intensify the inclination to participate in information concealment as a coping mechanism. Sleep deprivation and workplace exclusion exacerbate the hostile work environment and intensify knowledge hiding activities. Literature significantly supports the idea that workplace exclusion plays a significant role in moderating this link. It suggests that sentiments of exclusion might intensify the psychological distress caused by poor sleep quality, leading to a higher occurrence of knowledge concealment.

H6: The relationship between poor sleep quality and knowledge concealment is indirectly influenced by workplace exclusion, with the mediation of self-regulatory impairment.

The relationship between occupational exclusion and poor sleep quality, specifically in relation to a state of heightened self-regulatory dysfunction, can be better comprehended within this framework. assert that self-regulation plays a crucial role in managing workplace behaviors and emotions. Workplace exclusion hampers individuals' capacity for self-control, particularly when they are suffering from low sleep quality. Research also suggests that workplace exclusion is an additional factor that contributes to stress and might lead to further exhaustion of already limited self-regulatory abilities. This depletion further hinders individuals from engaging in pro-social workplace actions, hence increasing the probability of information concealing. Studies confirm that job exclusion might exacerbate self-regulatory deficits caused Due to inadequate sleep and deliberate hiding of information. The literature study findings corroborate the hypothetical model, indicating a probable correlation between subpar sleep quality and engagement in actions aimed at hiding knowledge. The correlation between these two phenomena is probably impacted by psychological distress and reduced self-control. Prior research has demonstrated that workplace exclusion plays a significant role in reducing the adverse impacts of inadequate sleep quality on psychological distress and decreased self-control. Consequently, this enhances the probability of knowledge being concealed while on the job. This review delves at the complex interplay between the quality of sleep, individual psychological traits, and the dynamics of the workplace as they pertain to the impact on employee conduct.

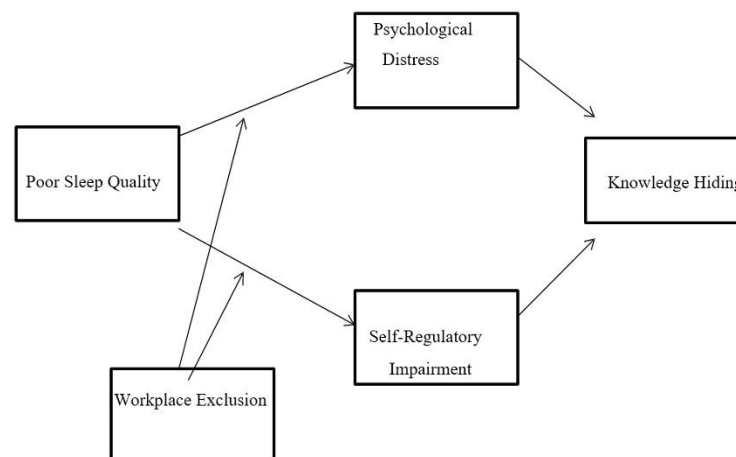


Figure 1: Theoretical Framework

Research Methodology

This study employs hypothesis testing to clarify the nature of relationships between variables. This research will utilize a causal study approach in order to ascertain the interdependence of variables. This research is being conducted in a real-life work setting, more precisely throughout a typical workday.

Sample Size and Sampling Technique

The target population comprises personnel from several consultant businesses. The sample comprises individuals who are employees actively engaged in consultancy businesses. At first, the data was collected from 250 responders, resulting in a significant range of information. Subsequently, the number was decreased to 200 by selectively including just the most precise and suitable data. The determination of the sample size was based on the assessment of statistical power, resource limitations, and the variabilities of responses. The researchers employed a stratified random sample method to guarantee the inclusion of individuals from various levels and departments within the consultant businesses. This technique will provide a thorough and all-encompassing perspective on the issues being examined.

Data Collection

Standardized, closed-ended questionnaires targeted at individuals working in consulting firms were used for data collection. The questionnaires were selected from already validated instruments that were utilized in earlier research, guaranteeing their reliability and validity. Questionnaires were distributed via email and in person, depending on the respondents' accessibility and convenience. Subsequent notifications were dispatched to ensure a significant rate of feedback.

Measurement Tools

Methodically organized and definitively concluded Questionnaires were created and distributed to staff at various consultancy businesses as a means of measurement. When selecting pre-existing questionnaires from prior research, it is important to note that they have been carefully designed and are likely to produce relevant and suitable results.

Data Analysis Techniques

The gathered questionnaires were examined using quantitative data. The data was analyzed using the statistical software programs SPSS and AMOS. These methods are appropriate for delivering precise values and quantitative measurements of research variables and their correlations. Statistical analysis of data to summarize and describe its main characteristics. Typically employed to concisely outline the fundamental characteristics of the data. The study included inferential statistical techniques, including regression analysis, ANOVA, and hypothesis testing, to examine correlations and associations between variables. Methods for analyzing multiple variables simultaneously: The application of Structural Equation Modeling was utilized to analyze intricate interactions between variables.

Assumptions of Multivariate Analysis

Throughout the development of multivariate analysis, numerous assumptions were scrutinized to confirm its validity. The data's normality was evaluated using statistical techniques, such as the Shapiro-Wilk test, to see whether the data adhered to a normal distribution. The linearity assumption ensures that there is a direct and proportional relationship between the variables that are not affected by other factors and the variables that are influenced by the independent variables. Examining the homoscedasticity assumption allowed us to confirm that the error distribution is continuous across all levels of the independent variables. By calculating the variance inflation factor (VIF), which seeks to discover any relationship among predictor variables, the presence of multicollinearity was evaluated. To determine if the mistakes were independent, the Durbin-Watson statistic was used ensuring that the residuals are not correlated with each other. Once these assumptions were tested and confirmed, they were verified for multivariate analysis in order to ensure that the data may be interpreted in a comprehensive and reliable manner.

Results and findings

Table 1 Sample Profile

Variable	Sample <i>n</i>	Sample %
Gender		
Male	125	61.6%
Female	78	38.4%

Table 1-Sample Profile

The following table, Table 1, displays the profile of the sample used for this investigation. In this study, information was gathered from a total of 203 participants, with 61.6% being male and 38.4% being female. 80% of the responders have completed a Bachelor of Arts degree. Furthermore, the majority of the employees belong to the age range of 21-27.

Reliability Analysis

In order to determine if a construct in table 2 is reliable, we use Cronbach's Alpha, which must be more than 0.70. According to the study, the construct of poor sleep quality has a reliability of 0.795, which is higher than the criterion of 0.70. Except for workplace exclusion, which has a value below this acceptable threshold of 0.678, all of the other dimensions studied in this study—psychological distress, self-regulatory impairment, knowledge concealment, and workplace exclusion—meet the minimal acceptable criterion of 0.70. While still considered adequate, this indicates that the employment exclusion scale's internal dependability is not totally sufficient.

Table 2 Reliability Analysis

Cronbach Alpha	Variable Name
$\alpha = 0.795$	Poor Sleep Quality
$\alpha = 0.826$	Psychological Distress
$\alpha = 0.754$	Self-regulatory Impairment
$\alpha = 0.678$	Workplace Exclusion
$\alpha = 0.767$	Knowledge Hiding

Component Factor Analysis

Table 3 is referenced. Principal component analysis provides a comprehensive and detailed representation of data in three dimensions. The CFA primarily identifies

The process of aligning elements of structures using gathered information.

Table 3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.708
Bartlett's Test of Sphericity	Df	1326
	Sig.	0.000

The KMO and Bartlett's test were conducted to evaluate the appropriateness of Factor Analysis. The dataset findings satisfy the minimum permissible threshold of 0.70. In addition, the significance value is 0.000, which

is lower than the threshold of 0.05. The researcher employed the Barlett's and Kaiser-Mayer-Olkin (KMO) test to evaluate the precision of the research, which was determined to be suitable and precise.

Mean and Standard Deviation of constructs

Table 4 Mean and Standard Deviation of Constructs

Variables	Mean	Std. Deviation	N
PSQ	0.9775	0.51380	203
KH	2.2053	0.59444	203
PD	2.6079	0.72141	203
WE	2.7385	0.57311	203
SRI	3.1724	0.87340	203

The table 4 specifies that the standard deviation (SD) should fall between the range of 0.5 to 1. The values of the standard deviations for the constructs that were examined in this research are acceptable.

Correlation

PSQ	1				
KH	0.287*	1			
PD	0.293**	0.275**	1		
WE	0.267*	0.227**	0.017	1	
SRI	0.037	-0.074	-0.286**	0.123	1

Table 5 Correlation

Table 5 indicates that the correlation value ranges from positive one to negative one. The chart clearly demonstrates that there is a significant positive correlation between poor sleep quality (independent variable) and knowledge concealment (dependent variable). Additionally, there is a substantial positive association between psychological discomfort and workplace exclusion. Nevertheless, there was a modest positive correlation between low sleep quality and impaired self-regulation, specifically acting as a mediator. Regarding the second component, information concealing, It is linked to a strong positive correlation with psychological distress and exclusion from the workplace. Moreover, there is a reciprocal correlation between the act of hiding knowledge and the weakening of self-regulation. There is a little positive association between psychological discomfort and occupational exclusion, although there is an inverse association between psychological discomfort and self-regulatory impairment. Moreover, there is a distinct and favorable correlation between vocational exclusion and impairment in self-regulation.

Hypothesis Testing

The table presents a summary of the regression weights and the outcomes of hypothesis testing. Highlighted are associations that are statistically significant ($p < 0.05$).

	Estimate	S.E.	C.R.	P	Label
P <-- ZSQ	.256	.059	4.323	***	par_1
D -					
P <-- Moderator	-.119	.055	-2.184	.029	par_3
D -					
S <-- Moderator	.120	.070	1.728	.084	par_4
RI -					
S <-- PD	-.372	.106	-3.525	***	par_5
RI -					
S <-- ZSQ	.000	.079	-.004	.997	par_6
RI -					
K <-- PD	.254	.070	3.657	***	par_2
H -					
K <-- SRI	.053	.056	.935	.350	par_7
H -					

Regression Weights: (Group number 1 - Default model) Table 6 Regression Weights

Table 6 clearly demonstrates a strong correlation between sleep quality and psychological well-being. The variables anguish, psychological distress, moderator (Workplace Exclusion), and psychological distress and knowledge concealment all satisfy the minimal acceptable threshold of 0.05. However, other associations are deemed unacceptable due to their p-values being greater than 0.05.

Hypothesis Testing

Hypothesis	Accepted/Rejected
H1: Poor sleep quality is positively associated with psychological suffering. The impact of workplace exclusion on moderation.	Accepted
The impact of workplace exclusion on regulating behavior.	
H2: Inadequate sleep quality has a beneficial effect on self-regulatory dysfunction.	Rejected
Considering the mitigating influence of occupational exclusion	
H3 Psychological anguish serves as an intermediary factor between low sleep quality and the act of hiding knowledge, leading to a positive impact.	Accepted
H4: Inadequate sleep quality positively affects knowledge concealing, with the mediation of self-regulatory impairment.	Rejected
H5: Workplace exclusion has a role in mitigating the connection between low sleep quality and the act of hiding knowledge, with the involvement of psychological distress as a mediator.	Accepted
H6: Workplace exclusion has a role in influencing the connection between poor sleep quality and the act of hiding knowledge, with the involvement of self-regulatory impairment as a mediator.	Rejected

Discussions

This study's findings provide valuable insights into the connections among inadequate sleep quality, psychological discomfort, impaired self-regulation, workplace exclusion, and information concealment among employees in consultancy businesses. The discussion is therefore structured according to the prescribed procedures outlined by Hair et al. (2021): analyzing the findings, contrasting them with relevant scholarly works, emphasizing the theoretical and practical ramifications, and proposing potential avenues for future investigation.

Interpretation of Results

The test results indicate a notable association between insufficient sleep quality and mental anguish, with the impact of occupational exclusion serving as a moderating element.

(H1: confirmed). Insufficient sleep quality heightens the likelihood of experiencing psychological discomfort among employees and exacerbates this effect when combined with workplace exclusion. These findings align with other research that has shown how sleep disruptions contribute to increased stress and emotional fatigue. But even when workplace exclusion is accounted for as a moderator, poor sleep quality does not substantially cause a decrease in self-regulation. The second hypothesis (H2) is in the negative. This finding ran counter to earlier studies that found a robust correlation between good sleep and self-regulation. People may have found ways to effectively manage self-regulation despite their sleep problems in the unique work environment of consulting firms, which is why this idea is dismissed. The results show that psychological anguish and poor sleep quality are associated with knowledge concealment (H3: Accepted). This discovery highlights the significant involvement of psychological discomfort in the process by which poor sleep quality results in the manifestation of knowledge-hiding behavior.

The significance of concentrating on the domain of psychological well-being in order to mitigate information concealment within organizations is highlighted by the indirect relationship. However, the presence of self-regulatory impairment related to information concealment, which is linked to low sleep quality, did not play a role in this case (H4: rejected). This could be attributed to the possibility that there may be additional valid explanations for the correlation between sleep quality and impairments in self-regulation, which impact the occurrence of knowledge concealment, but were not considered in this study. This study used statistical analysis to support the idea that psychological distress mediates the indirect association between poor sleep quality and knowledge concealment, and that workplace exclusion moderates this relationship. We found evidence that supports Hypothesis 5. Organizations face significant implications as a result of the combined detrimental impact of these laws that exclude certain workers and poor sleep on information exchange at work. Hypothesis 6 (Not Supported) states that, after controlling for self-regulatory impairment, the research did not discover any indication that workplace exclusion moderated the association between poor sleep quality and knowledge concealment. By ruling out H2, which implies that the decrease in self-regulation might not be that important in this case, this remark bolsters the earlier claim.

Compare to existing literature

The aforementioned findings add a fresh perspective to the current body of research by elucidating the role of workplace dynamics as a moderator or mediator between poor sleep quality and the consequences regarding mental anguish and the hiding of information. Kim and Kim (2019) shown that feeling excluded at work significantly amplifies home stress, which is consistent with our findings. However, overall, self-regulated impairment only produced marginally meaningful results. That is why it pays to look into other variables that could mediate or moderate these results.

Theoretical Implications

This study mainly adds to the existing theoretical literature by providing more evidence for the relationships between sleep quality and work habits. It is acknowledged that psychological discomfort is a major component influencing information concealment, and that exclusion in the workplace is a major factor in moulding this conduct. A more thorough understanding of knowledge hiding can be achieved by gaining insight into these interconnections. By adding the independent variable of sleep quality, the results enhance the stressor-strain-

outcome paradigm. This study adds significantly to our theoretical knowledge of the interplay between sleep deprivation, psychological distress, impaired self-regulation, and information concealment as it pertains to consulting firm personnel.

Integrating Sleep Quality into the Stressor–Strain–Outcome Framework

By include sleep quality, this study expanded the traditional stressor-strain-outcome paradigm as a crucial precondition. Historically, this approach has mostly concentrated on various factors that cause job-related stress and their immediate impact on employee outcomes, such as job performance and intents to leave the job. However, the consideration of sleep quality complicates the requirement to take into account personal health concerns that may significantly influence professional behaviors. The impact of an individual's health on their work behavior and the company's bottom line can be better grasped in this way.

Role of Psychological Distress as a Mediator

The study reveals that psychological distress has a mediator role in the connection between low sleep quality and knowledge concealment. The discovery highlights the fact that inadequate sleep quality has both a direct impact on unfavorable workplace behaviors and an indirect impact through heightened psychological distress. The sophisticated understanding aligns with the COR theory, which proposes that humans save their physical and emotional resources. The depletion of resources caused by poor sleep quality can lead to increased psychological distress, which in turn might promote behaviors such as information concealing. This behavior may serve as a defense strategy.

Workplace Exclusion as a Moderator

The presence of workplace exclusion plays a moderating role in the connection between inadequate sleep quality and psychological discomfort. This, in turn, indirectly affects knowledge concealment, resulting in a compounded impact of personal and organizational factors. The results indicate that being excluded from the workplace worsens the negative impact of having poor sleep quality on psychological distress, which in turn increases the occurrence of knowledge concealment behaviors. This verifies the social exchange theory, which states that employees respond negatively to unpleasant interactions in the workplace. The hypothesis is further elaborated upon by suggesting that personal weaknesses, such as experiencing low-quality sleep, can intensify harmful reciprocal behaviors.

Self-Regulatory Impairment

In contrast to prior research, it has been established that the absence of self-regulation does not significantly contribute to the relationship between knowledge concealment and poor sleep quality. Put simply, it signifies that anything may hold significance but is not of utmost importance in this specific situation. This discovery prompts a reassessment of the theory of self-regulation in relation to the quality of sleep and behaviors in the workplace. To clarify, an indicator in this context suggests that further investigation may be necessary to examine additional factors that influence the outcome or circumstances that limit the effect.

Practical Relevance of Psychological Well-being

Theoretically, the results highlight the importance of including mental health in models of behavior in the workplace. Resolving mental health difficulties is crucial for promoting positive organizational behaviors, as psychological distress has a substantial mediating effect. Having enough resources to counteract high job demands is emphasized by the job demands-resources theory. In order to avoid stress and increase involvement at work, this is essential. It has been demonstrated in this study that insufficient sleep quality depletes brain resources, much like a work demand. As a result, the JD-R paradigm has grown to include more aspects of both individuals and organizations.

Contribution to Knowledge Hiding Literature

By outlining and investigating the factors that come before it, this study adds to the growing corpus of literature on knowledge hiding. To better understand the motivations behind this behavior, it is helpful to establish a connection between low-quality sleep and psychological distress as significant predictors of knowledge

concealing. Integrating health and well-being aspects into the debate on knowledge sharing and concealment strengthens the theoretical frameworks of knowledge management and organizational behavior.

Practical Implications

In practical terms, the study suggests that interventions aimed at the organizational level should priorities enhancing the sleep quality and psychological well-being of employees. Implementing strategies to reduce workplace exclusion may help ease the cumulative effects on stress and the withholding of knowledge. Managers should acknowledge that insufficient sleep quality and emotions of being left out can have a negative impact on morale. To address this, they should offer helpful tools such as stress management programs and initiatives to create an inclusive workplace.

Future Research

Additional research should look into potential confounding variables that affect the connections between sleep, mental health issues, self-control, and keeping information hidden. Additional longitudinal studies would allow researchers to thoroughly examine the causal relationships and how they change over time. The applicability of research will be enhanced when conducted in diverse organizational contexts and cultural situations.

Conclusion

There is a clear connection between low sleep quality and psychological discomfort, which is influenced by occupational exclusion. A p-value below 0.05 indicates this. The results of this study lend credence to the idea that poor sleep quality is associated with higher levels of psychological distress and modifies the association between social isolation at work and emotional discomfort. Research indicates that when workers perceive unfairness in their workplace, it might lead to increased psychological suffering. Workers' views on organisational justice are explored in this study. According to Rupp and Cropanzano (2002), workers frequently imagine their employers as autonomous social entities with the power to dole out justice or injustice. The objective is to quantify the beneficial effect of low-quality sleep on the deterioration of self-regulation, while accounting for the moderating effect of social exclusion at work. Still, the p-value is higher than 0.05, therefore the results suggest that this link is not significant. Hypothesis 2: The objective is to quantify the beneficial effect of low-quality sleep on the deterioration of self-regulation, while accounting for the moderating effect of social exclusion at work. Still, the p-value is higher than 0.05, therefore the results suggest that this link is not significant. Hypothesis 3: Psychological distress acts as a mediator There is a favorable association between poor sleep quality and concealing information. With a p-value lower than 0.05, the hypothesis can be accepted as true. "Symptom clusters" have been defined by researchers as the combination of stress, insomnia, and mental health issues (Nishiura & Tamura, 2015). Hypothesis 4 aims to investigate the relationship between poor sleep quality and knowledge concealment, by taking self-regulatory impairment into account as a moderating factor. The lack of a discernible effect of the self-regulatory impairment on the correlation between the two variables provides strong evidence against this idea. Hypothesis 5: The relationship between poor sleep quality and knowledge concealment is indirectly influenced by workplace exclusion, with the mediation of psychological discomfort. The hypothesis has been validated. A p-value below 0.05 indicates statistical significance. According to the reviewed literature, psychological distress mediates the indirect relationship between poor sleep quality and ignorance, and occupational exclusion reinforces this link. Hypothesis 6 The objective of this study is to evaluate the extent to which workplace exclusion affects the connection between poor sleep quality and the concealment of knowledge, with self-regulatory impairment playing a role as a mediator. However, this hypothesis is disproven. In summary, the analysis revealed that the role of self-regulatory impairment in mediating the results of this study was found to be insignificant, indicating that it is not suitable for inclusion in the suggested model.

Managerial implications

Knowledge concealment has been demonstrated to be perilous for organizations and has negative repercussions on the entire company performance. Companies could combat these clandestine activities by arranging seminars and diverse information-sharing sessions to underscore the need of sharing knowledge. Our research suggests that a lack of quality sleep significantly impacts the tendency to conceal knowledge.

This effect is influenced by psychological distress and moderated by workplace exclusion. Thus, it is essential for managers to provide a welcoming and supportive workplace and deal with the issues that are making workers unhappy. Creating an inclusive environment where employees feel welcome and valued is an important component of this. A monthly assessment should be undertaken using a personality test to evaluate the extent of sleep problems and psychological distress. Additionally, implementing flexible working hours can help address sleep-related concerns. Companies should prioritize the availability of rest by implementing a 1-2-hour nap break, which would enhance employee efficiency.

Limitations

Like previous research, the new study also had limitations. At first, the findings were not applicable to all cities as the data was exclusively gathered from residents of Lahore. The outcomes could potentially vary if the identical study is conducted by incorporating additional cities. Furthermore, the participants in the present study consist exclusively of educated employees. The responder profile may vary in different geographical areas, which might therefore impact the results. Ultimately, certain participants declined to respond to the research inquiry and were consequently eliminated from the study.

Future line of Research

This study specifically examines the impact of poor sleep quality as an independent variable. However, there are additional elements that can impact the occurrence of information concealing among employees. By incorporating these independent factors, a subsequent investigation may be undertaken to contrast the effects of inadequate sleep quality with the previously obtained findings Regarding the topic of psychological distress and self-regulatory impairment. In addition, the conceptual framework has the potential to be expanded by incorporating components that have an indirect impact, such as mediators and moderators, in the relationship between the constructs utilized in this study.

References

- Al-Alawi, A. I., Al-Marzooqi, N. Y., & Mohammed, Y. F. (2007). Organizational culture and knowledge sharing: critical success factors. *Journal of knowledge management*, 11(2), 22-42.
- Altena, E., Van Der Werf, Y. D., Strijers, R. L., & Van Someren, E. J. (2008). Sleep loss affects vigilance: effects of chronic insomnia and sleep therapy. *Journal of sleep research*, 17(3), 335-343.
- Alaydi, B., Mahomed, A. S. B., Imm, N. S., & Hwa, C. J. (2023). The consequences of knowledge hiding behavior in organizations: A systematic literature review. *Economics and Business Administration*, 39(10), Article 5392. <https://doi.org/10.25115/eea.v39i10.5392>.
- Arias Aranda, D., & Molina-Fernández, L. M. (2002). Determinants of innovation through a knowledge-based theory lens. *Industrial Management & Data Systems*, 102(5), 289-296.
- Banks, K. H., Kohn-Wood, L. P., & Spencer, M. (2006). An examination of the African American experience of everyday discrimination and symptoms of psychological distress. *Community Mental Health Journal*, 42(6), 555–570. <https://doi.org/10.1007/s10597-006-9052-9>
- Barger, P. B., & Grandey, A. A. (2006). Service with a smile and encounter satisfaction: Emotional contagion and appraisal mechanisms. *Academy of management journal*, 49(6), 1229-1238.
- Barnes, C. M. (2012). Working in our sleep: Sleep and self-regulation in organizations. *Organizational Psychology Review*, 2(3), 234-257.
- Bayram, N., Bilgel, F., & Bilgel, N. G. (2012). Social Exclusion and Quality of Life: An Empirical Study from Turkey. *Social Indicators Research*, 105(1), 109–120. <https://doi.org/10.1007/s11205-010-9767-4>
- Blau, P. M. (1970). A formal theory of differentiation in organizations. *American sociological review*, 201-218.
- Cavicchioli, M., Movalli, M., & Maffei, C. (2019). Difficulties with emotion regulation, mindfulness, and substance use disorder severity: the mediating role of self-regulation of attention and acceptance attitudes. *The American Journal of Drug and Alcohol Abuse*, 45(1), 97–107.
- Černe, M., Hernaus, T., Dysvik, A., & Škerlavaj, M. (2017). The role of multilevel synergistic interplay among team mastery climate, knowledge hiding, and job characteristics in stimulating innovative work behavior. *Human Resource Management Journal*, 27(2), 281– 299. <https://doi.org/10.1111/1748-8583.12132>

- Chang, H. H., & Lin, R.-T. (2019). Policy changes for preventing and recognizing overwork-related cardiovascular diseases in Taiwan: an overview. *Journal of Occupational Health*, 61(4), 278–287.
- Connelly, C. E., & Zweig, D. (2015). How perpetrators and targets construe knowledge hiding in organizations. *European Journal of Work and Organizational Psychology*, 24(3), 479–489. <https://doi.org/10.1080/1359432X.2014.931325>
- Converse, P. D., & DeShon, R. P. (2009). A tale of two tasks: reversing the self-regulatory resource depletion effect. *Journal of Applied Psychology*, 94(5), 1318.
- Crain, T. L. (2012). *The Crossover Effects of Supervisor Work-Family Positive Spillover on Employee Sleep Deficiency: Moderating Effects of Family Supportive Supervisor Behaviors (FSSB)*. Portland State University.
- Curcio, G., Tempesta, D., Scarlata, S., Marzano, C., Moroni, F., Rossini, P. M., ... & De Gennaro, L. (2013). Validity of the Italian version of the Pittsburgh sleep quality index (PSQI). *Neurological Sciences*, 34, 511–519.
- Demirkasimoglu, N. (2015). Knowledge Hiding in Academia: Is Personality a Key Factor? *International Journal of Higher Education*, 5(1). <https://doi.org/10.5430/ijhe.v5n1p128>
- Denison, H. J., Jameson, K. A., Sayer, A. A., Patel, H. P., Edwards, M. H., Arora, T., ... & Baird, J. (2021). Poor sleep quality and physical performance in older adults. *Sleep Health*, 7(2), 205–211.
- Dijksterhuis, A. (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. *Advances in Experimental Social Psychology/Academic Press*.
- Duggan, K. A., Friedman, H. S., McDevitt, E. A., & Mednick, S. C. (2014). Personality and healthy sleep: the importance of conscientiousness and neuroticism. *PloS one*, 9(3), e90628.
- Firat, H., Yuceege, M., Kiran, S., Akgun, M., Demir, A. U., Aksu, M., Ardic, S., Karadeniz, D., Ucar, Z. Z., & Sevim, S. (2019). Absenteeism and delay to work due to sleep disorders in the Turkish adult population: a questionnaire-based national survey. *Workplace Health & Safety*, 67(1), 27–35.
- Fabbri, M., Beracci, A., Martoni, M., Meneo, D., Tonetti, L., & Natale, V. (2021). Measuring subjective sleep quality: a review. *International journal of environmental research and public health*, 18(3), 1082.
- Freeman, D., Sheaves, B., Waite, F., Harvey, A. G., & Harrison, P. J. (2020). Sleep disturbance and psychiatric disorders. *The Lancet Psychiatry*, 7(7), 628–637.
- Gammelgaard, J., & Ritter, T. (2005). The knowledge retrieval matrix: codification and personification as separate strategies. *Journal of Knowledge Management*, 9(4), 133–143.
- Grandner, M. A. (2019). Epidemiology of insufficient sleep and poor sleep quality. In *Sleep and health* (pp. 11–20). Academic Press.
- Hecht, T. D., & Allen, N. J. (2011). Who and what is fair matters: a multi-foci social exchange model of creativity. *Journal of Organizational Behavior*, 32(July 2009), 86–106. <https://doi.org/10.1002/job>
- Hecht, T. D., Allen, N. J., Demirkasimoglu, N., Černe, M., Hernaus, T., Dysvik, A., ... Oldroyd, J. B. (2015). How perpetrators and targets construe knowledge hiding in organizations. *Journal of Knowledge Management*, 24(3), 479–489. <https://doi.org/10.1080/1359432X.2014.931325>
- Hitlan, R. T., Clifton, R. J., & DeSoto, M. C. (2006). Perceived exclusion in the workplace: The moderating effects of gender on work-related attitudes and psychological health. *North American Journal of Psychology*, 8(2), 217–236.
- Hitlan, R. T., & Noel, J. (2009). The influence of workplace exclusion and personality on counterproductive work behaviours: An interactionist perspective. *European Journal of Work and Organizational Psychology*, 18(4), 477–502. <https://doi.org/10.1080/13594320903025028>
- Hombali, A., Seow, E., Yuan, Q., Chang, S. H. S., Satghare, P., Kumar, S., ... & Subramaniam, M. (2019). Prevalence and correlates of sleep disorder symptoms in psychiatric disorders. *Psychiatry research*, 279, 116–122.
- Huang, Q., Davison, R. M., & Gu, J. (2008). Impact of personal and cultural factors on knowledge sharing in China. *Asia Pacific Journal of Management*, 25, 451–471.
- Jansson, M., & Linton, S. J. (2006). The role of anxiety and depression in the development of insomnia: cross-sectional and prospective analyses. *Psychology and Health*, 21(3), 383–397.

- Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: results from the National Survey of Adolescents. *Journal of consulting and clinical psychology*, 71(4), 692.
- Knudsen, H. K., Ducharme, L. J., & Roman, P. M. (2007). Job stress and poor sleep quality: data from an American sample of full-time workers. *Social science & medicine*, 64(10), 1997-2007.
- Krystal, A. D., & Edinger, J. D. (2008). Measuring sleep quality. *Sleep medicine*, 9, S10-S17.
- Kühnel, J., Bledow, R., & Feuerhahn, N. (2016). When do you procrastinate? Sleep quality and social sleep lag jointly predict self-regulatory failure at work. *Journal of Organizational Behavior*, 37(7), 983-1002.
- Lamberg, L. (2004). Promoting adequate sleep finds a place on the public health agenda. *JAMA*, 291(20), 2415-2417.
- Lanaj, K., Johnson, R. E., & Barnes, C. M. (2014). Organizational Behavior and Human Decision Processes Beginning the workday yet already depleted? Consequences of late- night smartphone use and sleep. *Organizational Behavior and Human Decision Processes*, 124(1), 11-23. <https://doi.org/10.1016/j.obhdp.2014.01.001>
- Lee, K., & Allen, N. J. (2002). Organizational citizenship behavior and workplace deviance: the role of affect and cognitions. *Journal of applied psychology*, 87(1), 131.
- Lee, S., Kim, J. H., & Chung, J. H. (2021). The association between sleep quality and quality of life: a population-based study. *Sleep Medicine*, 84, 121-126.
- Leger, D. (1994). The cost of sleep-related accidents: a report for the National Commission on Sleep Disorders Research. *Sleep*, 17(1), 84-93.
- Leung, T. W., Siu, O. L., & Spector, P. E. (2000). Faculty stressors, job satisfaction, and psychological distress among university teachers in Hong Kong: The role of locus of control. *International journal of stress management*, 7(2), 121-138.
- Lim, S., & Tai, K. (2014). Family incivility and job performance: A moderated mediation model of psychological distress and core self-evaluation. *Journal of Applied Psychology*, 99(2), 351-359. <https://doi.org/10.1037/a0034486>
- Liu, Y., & Aungsuroch, Y. (2019). Work stress perceived social support, self-efficacy and burnout among Chinese registered nurses. *Journal of Nursing Management*, 27(7), 1445-1453.
- Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy*, 20, 105-113. <https://doi.org/10.1016/j.tranpol.2012.01.013>
- Mackey, A., Gass, S., & McDonough, K. (2000). How do learners perceive interactional feedback?. *Studies in second language acquisition*, 22(4), 471-497.
- Magnavita, N., Di Stasio, E., Capitanelli, I., Lops, E. A., Chirico, F., & Garbarino, S. (2019). Sleep problems and workplace violence: a systematic review and meta-analysis. *Frontiers in neuroscience*, 13, 997.
- Maheshwari, G., & Shaukat, F. (2019). Impact of poor sleep quality on the academic performance of medical students. *Cureus*, 11(4).
- Marchand, A., Demers, A., & Durand, P. (2005). Does work really cause distress? The contribution of occupational structure and work organization to the experience of psychological distress. *Social science & medicine*, 61(1), 1-14.
- Marsh, A., & Mullins, D. (1998). The social exclusion perspective and housing studies: origins, applications and limitations. *Housing studies*, 13(6), 749-759.
- Molero Jurado, M. D. M., Pérez-Fuentes, M. D. C., Atria, L., Oropesa Ruiz, N. F., & Gázquez Linares, J. J. (2019). Burnout, perceived efficacy, and job satisfaction: Perception of the educational context in high school teachers. *BioMed research international*, 2019(1), 1021408.
- Massé, R., Poulin, C., Dassa, C., Lambert, J., Bélair, S., & Battaglini, A. (1998). The structure of mental health: Higher-order confirmatory factor analyses of psychological distress and well-being measures. *Social indicators research*, 45, 475-504.
- Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as a limited resource: regulatory depletion patterns. *Journal of personality and social psychology*, 74(3), 774.

- Nielsen, M. B., Harris, A., Pallesen, S., & Einarsen, S. V. (2020). Workplace bullying and sleep—A systematic review and meta-analysis of the research literature. *Sleep medicine reviews*, 51, 101289.
- Nishiura, M., Tamura, A., Nagai, H., & Matsushima, E. (2015). Assessment of sleep disturbance in lung cancer patients: relationship between sleep disturbance and pain, fatigue, quality of life, and psychological distress. *Palliative & supportive care*, 13(3), 575-581.
- Nunes, D. M., Mota, R. M. S., de Pontes Neto, O. L., Pereira, E. D. B., de Bruin, V. M. S., & de Bruin, P. F. C. (2009). Impaired sleep reduces quality of life in chronic obstructive pulmonary disease. *Lung*, 187, 159-163.
- Okano, K., Kaczmarzyk, J. R., Dave, N., Gabrieli, J. D. E., & Grossman, J. C. (2019). Sleep quality, duration, and consistency are associated with better academic performance in college students. *NPJ Science of Learning*, 4(1), 1–5.
- Peng, H. (2013). Why and when do people hide knowledge?. *Journal of knowledge management*, 17(3), 398-415.
- Pereira, D., Semmer, N. K., & Elfering, A. (2014). Illegitimate tasks and sleep quality: An ambulatory study. *Stress and Health*, 30(3), 209–221. <https://doi.org/10.1002/smi.2599>
- Porath, C. L., & Bateman, T. S. (2006). Self-regulation: from goal orientation to job performance. *Journal of Applied Psychology*, 91(1), 185.
- Reidpath, D. D., Chan, K. Y., Gifford, S. M., & Allotey, P. (2005). ‘He hath the French pox’: stigma, social value and social exclusion. *Sociology of health & illness*, 27(4), 468-489.
- Richards, A., Kanady, J. C., & Neylan, T. C. (2020). Sleep disturbance in PTSD and other anxiety-related disorders: an updated review of clinical features, physiological characteristics, and psychological and neurobiological mechanisms. *Neuropsychopharmacology*, 45(1), 55-73.
- Robbins, R., Jackson, C. L., Underwood, P., Vieira, D., Jean-Louis, G., & Buxton, O. M. (2019). Employee sleep and workplace health promotion: a systematic review. *American Journal of Health Promotion*, 33(7), 1009-1019.
- Rupp, D. E., & Cropanzano, R. (2002). *The mediating effects of social exchange relationships in predicting workplace outcomes from multifoci organizational justice*. 89, 925–946.
- Samers, M. (1998). Immigration, ‘ethnic minorities’, and ‘social exclusion’ in the European Union: a critical perspective. *Geoforum*, 29(2), 123-144.
- Santos, M. B., Pierce, G. J., Learmonth, J. A., Reid, R. J., Ross, H. M., Patterson, I. A. P., ... & Beare, D. (2004). Variability in the diet of harbor porpoises (*Phocoena phocoena*) in Scottish waters 1992–2003. *Marine Mammal Science*, 20(1), 1-27.
- Scott, K. L., Restubog, S. L. D., & Zagenczyk, T. J. (2013). A social exchange-based model of the Antecedents of workplace exclusion. *Journal of Applied Psychology*, 98(1), 37–48. <https://doi.org/10.1037/a0030135>
- Shaw, M., Dorling, D., Gordon, D., & Smith, G. D. (2001). Putting time, person and place together: the temporal, social and spatial accumulation of health inequality. *Critical Public Health*, 11(4), 289-304.
- Sohn, S. I., Kim, D. H., Lee, M. Y., & Cho, Y. W. (2012). The reliability and validity of the Korean version of the Pittsburgh Sleep Quality Index. *Sleep and Breathing*, 16, 803-812.
- Spiegel, K., Leproult, R., & Van Cauter, E. (1999). Impact of sleep debt on metabolic and endocrine function. *The lancet*, 354(9188), 1435-1439.
- Telzer, E. H., Fuligni, A. J., Lieberman, M. D., & Galván, A. (2013). NeuroImage The effects of poor quality sleep on brain function and risk taking in adolescence. *NeuroImage*, 71, 275–283. <https://doi.org/10.1016/j.neuroimage.2013.01.025>
- Tesfaye, W., Getu, A. A., Dagnew, B., Lemma, A., & Yeshaw, Y. (2024). Poor sleep quality and associated factors among healthcare professionals at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia. *Frontiers in Psychiatry*, 15, 1225518.
- Tice, D. M., Baumeister, R. F., Shmueli, D., & Muraven, M. (2007). Restoring the self: Positive affect helps improve self-regulation following ego depletion. *Journal of experimental social psychology*, 43(3), 379-384.

- Vanmontfort, D., Berghman, L. R., Rombauts, L., Verhoeven, G., & Decuypere, E. (1995). Developmental changes in immunoreactive inhibin and FSH in plasma of chickens from hatch to sexual maturity. *British poultry science*, 36(5), 779-790.
- Vertes, R. P., & Siegel, J. M. (2005). Time for the sleep community to take a critical look at the purported role of sleep in memory processing. *Sleep*, 28(10), 1228-1229.
- Vohs, K. D., & Faber, R. J. (2007). Spent resources: Self-regulatory resource availability affects impulse buying. *Journal of consumer research*, 33(4), 537-547.
- Wang, Z., Patterson, C. M., & Hills, A. P. (2002). A comparison of self-reported and measured height, weight and BMI in Australian adolescents. *Australian and New Zealand journal of public health*, 26(5), 473-478.
- Welsh, D. T., & Ordóñez, L. D. (2014). Organizational Behavior and Human Decision Processes The dark side of consecutive high performance goals: Linking goal setting , depletion , and unethical behavior. *Organizational Behavior and Human Decision Processes*, 123(2), 79– 89. <https://doi.org/10.1016/j.obhdp.2013.07.006>
- Wickins, J. (2007). The ethics of biometrics: The risk of social exclusion from the widespread use of electronic identification. *Science and Engineering Ethics*, 13(1), 45–54. <https://doi.org/10.1007/s11948-007-9003-z>
- Piquero, M. J. H. A. R., & Greene, Z. A. P. J. Policing: An international journal of police strategies & management. *Management*, 39(2), 246-267.
- Seddon, T. (2006). Drugs, crime and social exclusion: social context and social theory in British drugs–crime research. *British journal of criminology*, 46(4), 680-703.
- Visvalingam, N., Sathish, T., Soljak, M., Chua, A. P., Dunleavy, G., Divakar, U., ... & Car, J. (2020). Prevalence of and factors associated with poor sleep quality and short sleep in a working population in Singapore. *Sleep Health*, 6(3), 277-287.

Impact of Financing Modes on The Financial Performance of The Islamic Banking System in Pakistan

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Abstract

The purpose of this research was to observe the impact of financing modes of Islamic Banks on their financial performance i.e. Return on Assets, Return on Equity, and Default Ratio. Secondary data was collected from the annual financial statements of selected full-fledged Islamic Banks of Pakistan for the last 10 years from 2011 to 2020. Aside, SBP Policy rates from 2011- 2020, have also been included as a control variable. The logic behind the selection of this period was that the first decade from 2000-2010, is considered the development phase for Islamic Banks whereas during the selected period Islamic Banks have grown into independent institutions and captured handsome market share both in terms of amount & branch network. Accordingly, the variables were tested using Generalized Least Square Regression Analysis (Random and Fixed Effect Model) and the results are presented. According to the findings of this research, Murabahah (MF), Istisna (ISF), and Private Sukuk (PS), are having significantly positive impact on Return on Assets (ROA) and Return on Equity (ROE) while Istisna and Private Sukuk financings are having a significantly negative impact on Default Ratio which suggest that increase in both these financing are causes no increase in default. These findings have led to the recommendations that above said financing modes are having a significantly favorable impact on the financial performance of Islamic Banks. Therefore, the management of Islamic Banks needs to prioritize their investment towards Murabahah, Istisna, and Private Sukuk, as they are yielding better results which will contribute more towards their financial performance and ultimately towards the economy.

Keywords: Islamic Financing Modes, Financial Performance, Murabahah, Diminishing Musharakah, Running Musharakah, Ijara, Salam, Istisna, Sukuk.

INTRODUCTION

One of the five questions Muslims will be asked on Judgment Day will be: “How did you earn your wealth and how did you spend it” (Al-tirmidhi, 864/5). This forces the Muslims to generate income from Halal sources and spend it on Halal categories of expenditures. Islam is a religion that provides a complete way of life and does not restrain man from earning money & doing business rather it spiritualizes all aspects of human life whether it is social, political, economic, etc. while remaining within the divine guidelines that are generated from primary sources (Quran, Sunnah, & Hadith) and secondary sources (Ijama'a & Qiyas). The above sources of Sharia'ah guidelines provide practical and viable solutions to human economic problems. Islamic economic system works under divine guidelines which include the creation & spending of wealth in a manner that is not only beneficial to individuals but society as a whole (Ayub, 2016). Unlike other economic systems (capitalism and socialism), Islamic Economic System provides a balance solution to human needs as on one hand, it associates the concept of profit and loss sharing with capital instead of interest, while on the other hand, being secondary ownership conferred upon man, he is also guided regarding earnings & spending of wealth, which ultimately brings social welfare & justice to the society (Khan, 2016).

Historical Background of Islamic Banking

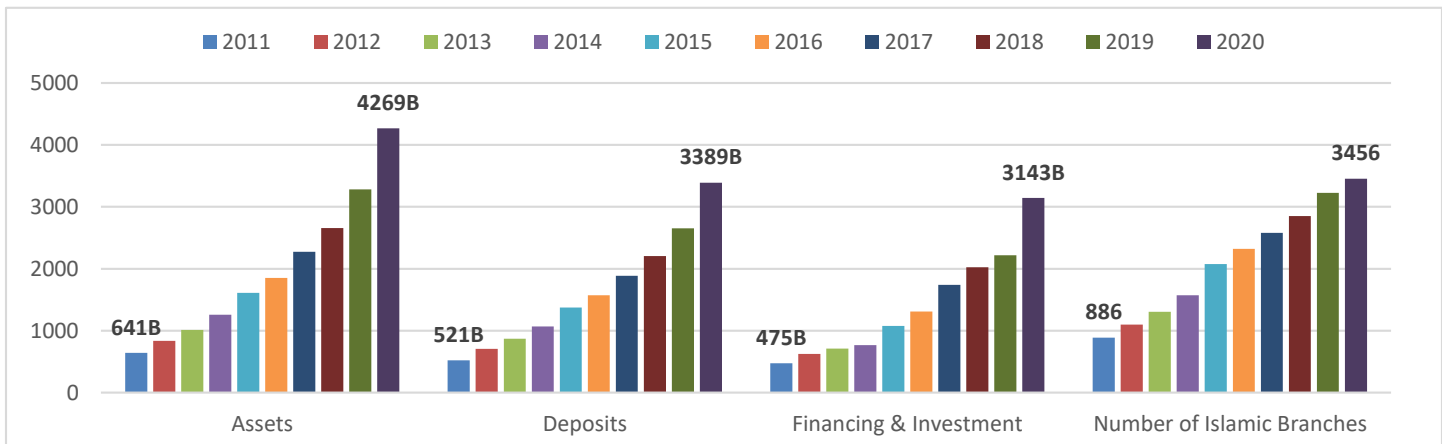
Although, the concept of Islamic economics emerged with the rise of Islam and doctrine of prohibition of interest, however, the formation of modern-day Islamic banking was a reaction to penetration of western banks in Islamic societies which disturbed the Muslim intellectuals due to the involvement of *riba* who opposed such banking and advised Muslims to stay away from such practices (Shinsuke, 2012).

In the middle of the 20th century, the Muslim intellectuals started looking for an alternative system as it was nearly impossible for traders to stay away from the banking system. The foundation of modern Islamic Banking was laid by "Mit-Ghamr" in Egypt in 1960 which started mobilizing deposits from Muslims based on profit sharing basis. In 1963, another financial institution was established in Malaysia to help Muslims save money for Hajj (pilgrimage), which is known as Lembaga Urusan Tabung Haji (Pilgrim Management & Fund Corporation). Both these non-banking institutions paved way for the establishment of Dubai Islamic Bank in 1975, Faisal Islamic Bank in Sudan and Kuwait Finance House in 1977. Since then several Islamic countries like Iran, Pakistan, Turkey, etc. started efforts for establishing Islamic Banks. Alongside, efforts for the development of unified financial and legal infrastructure were also made which ultimately resulted in the establishment of AAOIFI (Accounting & Auditing Organization for Islamic Financial Institutions) in 1991 in Bahrain (Hussein, 2015). Besides, in 2002 in Malaysia Islamic Financial Service Board (IFSB) was also established which is responsible for issuing regulatory and supervisory guidelines. As a result of such efforts, Islamic banking also flourished in the western world like Citi Islamic Investment Bank & Al-Rayan Bank in the UK, Lariba American Finance House in the US, Arab Bank (Switzerland), MCC Islamic Finance & Investment in Australia, Kuveyt Turk Islamic Bank Germany (Zainordin, 2016). The journey towards the development of a sustainable Islamic Financial Industry continued over the period and as of December 2020, there are 507 Islamic Banks including 207 Islamic Banking Windows and around 250 Mutual Fund & Takaful companies. The total assets of the global Islamic Financial Industry have grown to \$ 2.700 Trillion by the end of 2020, posting a healthy growth rate of 10.7% over the previous year (IFSB, 2021).

History of Islamic Banking in Pakistan

In Pakistan efforts for the elimination of *riba* from the economy and Islamization of the banking system started in 1977-78. In July 1979, Islamization were initiated in specialized financial institutions like HBFC, ICP & NIT, followed by commercial banks, whereby, Mudarbah based interest-free instrument in the shape of Participation Term Certificates (PTC) were introduced, on the concept of Profit & Loss sharing. The funds so mobilized were invested in commodity operations of the government based on deferred sale bearing mark-up on the purchase price. Later on, financing for import bills and purchases of merchandise were also transferred to mark-up on purchase price. In July 1982, SBP allowed banks to provide finances for working capital requirements of selective industries based on Musharaka. In July 1985, all banks were directed to accept deposits only on a profit & loss sharing basis. However, all these efforts suffered a huge blow when it was pronounced as un-Islamic by Federal Shariat Court in November 1991, duly ratified by Shariat Appellate Bench (SAB) of the Supreme Court of Pakistan, on December 23, 1999. Subsequently, the Government constituted Commission for Transformation of Financial System (CTFS) in January 2000 in SBP. Upon the recommendations of the CTFS, SBP started allowing setting-up Shariah based subsidiaries, designating Islamic banking branches and full-fledged Islamic banks. The CTFS identified major Shariah-Compliant products, model agreements and guidelines for conversion of existing conventional products and services (Ijaz, 2013). The Commission further identified different modes of Islamic financing such as Mudarabah, Murabaha, Ijara, Musharakah, Istisna, Salam, Musawama, etc. which was approved by the then Shariah Board (Ijaz, 2013). There is no doubt that the main sources of income in a bank comes from financing sources (Alzoubi, 2018), yet, the investment preferences in each mode differ from one bank to another. In line with these studies, this research is aimed to analyze the impact of Islamic modes of financing on financial performance like Return On Assets (ROA), Return On Equity (ROE) and Default Ratio (DR) of full-fledged Islamic Bank in Pakistan. Since its start in 2000, Islamic Banking in Pakistan faced many challenges, yet, it has witnessed notable growth in all aspects and now we have a much more developed and improved version of Islamic Banking, though, it still needs to overcome certain drawbacks. Currently Islamic Banking represents 17% market share in the overall Banking Industry of Pakistan, in terms of assets and 18.4% in terms of deposits (SBP, Islamic Banking Bulletin, April - June 2021). As of date there are 22 IBs in Pakistan out of which 05 are full-fledged Islamic Banks while 17 Conventional Banks are having standalone Islamic Banking setups (SBP, Islamic Banking Bulletin, April - June 2021). The below figure shows the growth of IB during the last 10 years.

Progress & Growth of Islamic Banking (Last 10 Years)



Research Gap

Since inception of Islamic banking its performance has remained the main research study of scholars & academicians interested in Islamic Banking. Considerable researches have been conducted on financial performance of Islamic Banks in the last two decades especially in Malaysia, Indonesia, Egypt, Kenya and other MENA countries. In Pakistan, however, most of the research studies are based on comparison of financial performance of Islamic and Conventional banking. (Asif et al., 2017; Journal et al., 2016; Khan & Ahmad, 2018; Moalim & Nairobi, 2015). A very small number of studies can be found which have studied the impact of Islamic modes of financing on the Financial Performance of Islamic Banks. Most of these studies have undertaken one mode of finance as study variable (Belkhaoui, Alsagr, & van Hemmen, 2020; Boyante, 2014; Ijaz, 1999). Others have analyzed financial performance of Banks with external factors like GDP, Inflation Rate and Unemployment (Anwar, 2018)

Therefore, there is a need to conduct such a study which not only consider Bank's internal factors but also take into account all the available Islamic modes of financing to explain their impact on the financial performance of Islamic banks like ROA, ROE & DR.

Research Questions

Based on the above discussion and to meet the research objective; an in-depth analysis of the research variables have been conducted to answer the following research question:

1. What is the impact of modes of financing on the financial performance (ROA, ROE, DR) of Islamic banks?
2. What are the preferences of Islamic Banks on the basis of their offering / financing?

Research Objectives

The main objectives of this research are to analyze the following:

1. To analyze the Islamic Modes of financing of Islamic Banks.
2. To find out the impact of each financing mode on the financial performance of Islamic Banks.

Significance of the Study

Since there is little research regarding the financial performance of Islamic Banks relative to financing modes, therefore, various groups can benefit from its findings. First, this study will be useful for scholars/researchers of finance interested in Islamic Banking. Second, these findings are helpful to the Management & employees of Islamic Banks in identifying which financing product is yielding better results. Third, this research can be of great help to customers as it will enable them to make informed decisions while choosing Islamic banks based on their performance.

Research Hypotheses

- H₁ = Murabahah Finance has a significant positive or negative impact on ROA, ROE & DR.
 H₂ = Ijara Finance has a significant positive or negative impact on ROA, ROE & DR.
 H₃ = Running Musharkah has a significant positive or negative impact on ROA, ROE & DR.
 H₄ = Diminishing Musharka has a significant positive or negative impact ROA, ROE & DR.
 H₅ = Istisna Finance has a significant positive or negative impact on ROA, ROE & DR.
 H₆ = Salam Finance has a significant positive or negative impact on ROA, ROE & DR.
 H₇ = GOP Sukuk Finance has a significant positive or negative impact on ROA, ROE & DR.
 H₈ = Private Sukuk has a significant positive or negative impact on ROA, ROE & DR.

Literature Review

The basic rules and guidelines for Islamic Banking are derived from the primary source of Shari'ah i.e. Quran and Sunnah and secondary sources i.e. Qiyas, Ijma and Ijtihad, etc. Islamic Banking has to function based on certain principles while remaining within the Shari'ah guidelines and by disallowing interest, gharar, maysir as well as other unethical activities (Zainordin, 2016). Islam strictly disallows paying or charging of interest between parties as narrated in the following verses (2:278-279) of the Quran:

“278. O ye believe; Fears Allah and give up what remains of your demand for usury, if ye are Indeed believers”.

“279. If ye do not, take notice of war from Allah and His Messenger: but if ye turn back, ye shall have your capital sums; Deal not unjustly and ye shall not be dealt with unjustly”.

Similarly, the Prophet (PBUH) also denounced riba (interest) through various Hadiths such as Ibn-e-Masood (mAbpwh), narrated that,

“The Messenger of Allah (Peace Be Upon Him) has cursed the one who devours Riba (interest), the one who pays it, the one who witnesses it, and the one who documents it”.

In addition to interest, Islam also disallows anything that allows gharar, maysir etc. (El-Gamal, 2000). For example, Abu-Said Al-Khudry (mAbpwh) narrated that,

“The Prophet (Peace Be Upon Him) has prohibited the purchase of an unborn animal in its mother's womb, the sale of milk in udder without measurement, the purchase of spoils of war before its distribution, the purchase of charities before its receipt and the purchase of the catch of a diver”.

In line with the above revelations, Islamic Banks cannot engage in such activities that are declared “Haraam” by Islam such as the trading of alcohol, tobacco, pork meat, or investment in constructions of casinos (Kasmani, 2013). Islamic banking is based on risk-sharing culture, which creates a nexus of the real economy with the financial sector and helps in just redistribution of wealth to eliminate imbalances (Ayub M. , 2017). (Possumah and Ahmat 2018) concluded that in Malaysia the overall efficiency of Islamic Banks has increased over time. (Mokhtar, 2008) argued that full-fledged Islamic Banks were more efficient than Islamic windows, however, comparatively conventional banks were more efficient in terms of performance than Islamic Banks.

(Belkhaoui *et al.* 2020) studied the internal factors of Islamic & Conventional Banks profitability by selecting 68 Banks (42 Islamic & 26 Conventional) from 13 MENA countries and proved that bank size, deposit to assets, equity to assets, and cash to assets contribute more to Islamic Banks profitability compared to conventional banks. Another study in Bangladesh founds that credit risk, cost efficiency and higher capitalization have significantly negative while bank size have a robust positive impact on Bank's profitability (Noman, 2015). In another study, scholars checked the impact of Islamic financing modes on economic growth and proved that except for Mudarbah all other financing modes like Ijara, Istisna, Musharakah, Murabaha, were having a significantly positive relationship with GDP (Bakhita, 2017).

Nonetheless, the profitability and efficiency of banks mainly depend upon investment strategies. There are mainly three types of investors such as a conservative investor, moderate investor, and aggressive investor (Kavitha, 2015). The same is the case with Islamic Banks in Pakistan wherein some Banks uses comparatively aggressive investment strategies while other remain moderate or conservative keeping in view their risk-return approach.

Various researches regarding factors affecting investment decisions have been conducted so far, like (Bakara, 2016) investigated the impact of psychological factors on investment decision in Malaysian stock market: “A case of Klang Valley and Pahang”. Faruq (2014) analyzed the perception of bankers and customers regarding deposit and investment mechanism of Islamic and Conventional Banking in Bangladesh. Besides, (Roshayani Arshad, 2012) found a significant positive relationship of Corporate Social Responsibility with the financial performance of Islamic Banks. Similarly, Boyant (2014) analyzed the effect of Islamic modes of financing on the profitability of commercial banks in Kenya, wherein, he found a strong relationship between Islamic Modes of Financing and Return on Asset (ROA). However, this study also combined the investment of each financing of all the selected banks, and accordingly, its impact has been analyzed on the overall profitability.

On the national front, a number of researches have also been conducted, however, most of these researchers have considered only one aspect of Islamic modes of financing. For example, Sabir (2008), conducted research on the prospects of Ijarah and lease financing in the banking sector of Pakistan from 2005 to 2008, for which data were collected from four banks (Askari commercial bank, Bank Alfalah, Standard Chartered, and Muslim Commercial bank) by covering both their Conventional as well as Islamic banking. It was found that Ijara financing was progressively rising due to the interest-free-mode of financing as compared to conventional lease financing.

Javed (2011) investigated the impact of internal factors, assets, loans, equity, and deposit on a Bank's profitability in Pakistan over a period from 2004 to 2008 and found that deposits, equity and loans have a significant impact on the profitability of Banks while assets have an insignificant impact on performance. Khan (2014) found that Bank's internal factors have significant impact on profitability of Islamic Banks. Samad (2004) found that Islamic Banks have a comparatively higher level of liquidity and higher investment in government securities due to Shari'ah restrictions on some of the investment avenues.

Naqvi (2014) also researched the analysis of Growth of Ijara in Pakistan by selecting Meezan Bank as a case study, wherein she proved that there is a strong relationship between Deposit & Share Capital and Ijara investment. Khan (2018) have investigated the financial performance of five Islamic and five conventional banks by comparing their financial ratios and found that Islamic banks are less profitable, less risky, less efficient but more liquid compared to conventional banks. Ongore (2013) founds that Bank's specific factors have a strong relationship with financial performance as compared to other factors like inflation, GDP, unemployment, etc. in Kenya.

Rehman (2020), founds that there is significantly negative relationship between CSR and financial performance of Islamic Banks during the period 2012-2017. Majeed (2017), proved that Islamic Banks are less profitable than conventional banks but better capitalized, less risky and have higher liquidity.

From the above discussion it seems that, besides, limitation either on one aspect or the other, the geographical areas of most of these researches were outside Pakistan. Whereas in Pakistan most of the researchers have analyzed the relationship of overall profitability with overall investment while, some of them (Gul, 2011) have studied the relationship of overall financial performance with external factors like macroeconomic indicators.

Thus, this research will help a great deal in fulfilling the gap and answering the above questions, besides, it will help to open new avenues for researchers in the field of Islamic banking. In addition to its importance for academicians, this research will be extremely helpful to specialized bankers in devising their investment strategies which will ultimately increase the performance of their institutions.

Islamic Modes of Financing

To have a viable Islamic banking system, a different product-base has been developed by Ulemas & Shari'ah scholars both on deposit as well as financing sides which are based on participation, trade and Ijara (lease) (Anwar, 2018). Following are some of the major financing modes used by Islamic Banks across the world:

Murabahah Finance

Sale transaction wherein the seller agrees with the purchaser for selling a specific commodity by disclosing the actual cost plus profit, is called Murabahah (Usmani, 1998). In banking Murabaha, the Bank upon customer's request, acquires an asset and after assuming its ownership and possession, sells it to the customer on a cost-plus-

profit deferred payment (Khan, 2016).

Ijara Finance

Ijara is the word of Islamic Fiqhah, which means giving something on rent. An agreement wherein the Bank purchases an asset and gives its usufruct to the customer in exchange for rent. The lessor is called "Muajjir", the lessee "Mustajir" and rent is called "ujrah" (Usmani, 1998).

Running Musharakah

An agreement wherein the bank participates in operating activities of customer's business and shares the profit & loss (Usmani, 1998). This financing mode is mainly used to finance identified primary operative activities of the customer based on the principles of Musharakah.

Diminishing Musharakah

In this financing mode the Islamic Bank & the customer participates in joint ownership of a property / asset, which is divided into units. The joint asset is then rented-out to the customer for usufruct who undertakes to purchase proportionate share of the Bank along-with payment of rental for use of the asset. Thus, the share of the customer increases and at the end, owns the entire asset (Usmani, 1998).

Istisna Financing

In the Istisna transaction, the customer requests the Bank for the purchase of a specific asset /goods to be delivered on a future specified date. Subsequently, the Bank enters into a parallel Istisna contract with the manufacturer for purchase of specific product and upon completion, the seller delivers the goods either to the Bank or directly to the customer (Usmani, 1998).

Salam Finance

A sale transaction wherein the seller sells goods to an Islamic Bank to be delivered on a future pre-determined date against spot payment. The Bank sells the same to a purchaser on cash or deferred payment. However, both the transactions must be separate & independent from each other. The buyer is known as "rab-ul-salam", seller as "muslamilaih" and price as "ras-ul-mal" (Usmani, 1998).

Sukuk Finance

Sukuk is the plural the Arabic word "Sakk" which means a certificate (Khan, 2016). Sukuk is a Shariah-based product used by Islamic Banks, wherein the banks invest its capital in a Musharakah Pool to complete a joint venture /project and earn profit as per agreed ratio whereas the loss is shared according to their investment (Usmani, 1998).

Financial Performance

Financial performance is a measure that tells about the financial health of an organization. Like other institutions, the financial performance of Islamic Banks also depends upon Bank's internal factors (financing strategies, Bank size, Bank capital, etc.) as well as external factors like GDP, Inflation, etc. (Jamil Anwar, 2018). Good financial performance plays a vital role in the development of the financial and economic sector as it rewards the shareholders which ultimately induces them for more investment (Ongore, 2013). There are different metrics of financial performance however, in case of Banks Return on Assets, Return on Equity and Default Ratio are considered most valuable.

Return on Assets (ROA)

Return on assets is a financial ratio that measures how profitable a bank/company is, relative to its assets. This ratio apprehends how efficiently the business is using its assets for profit generation (Horne's, 2009) and can be calculated as: $\text{Net Profit After Tax} / \text{Total Assets}$

Return on Equity (ROE)

Return on Equity is a profitability ratio that measures the overall return of a firm concerning its equity. It compares a company's Net Profit After Tax with stockholders' capital (Horne's, 2009). The formula of Return on Equity is:

Net Profit After Tax / Shareholder's Equity

Default Ratio (DR)

Default ratio measures the assets quality of business and is calculated by dividing total Non-Performing Loans by Total Financing (Advances). Default ratio determines how many portfolios of loan/financing is at the risk of default.

Research Methodology

Research Type

The research is quantitative in nature and panel data has been collected from the financial statements of four full-fledged Islamic banks for the last 10 years i.e. from 2011 to 2020.

Population and Sample Size

The population of this research is entire Islamic Banks of Pakistan, out of which four full-fledged Islamic banks have been selected as sample i.e. Meezan Bank Limited, Dubai Islamic Bank Pakistan, Bank Islamic Pakistan Limited, Al-Barakah Bank Limited.

Rationale for Selecting Sample

Presently, in Pakistan there are 17 Islamic Banks, however, five of them are independent & full-fledged Islamic Banks which have been selected as sample however, since MCB Islamic Bank (MIB) is a subsidiary of MCB Bank, besides, its data for the last 10 years were also not available, therefore, it has been excluded from the sample base. The main reason for selecting full-fledged Islamic Banks as sample was due to the fact that remaining banks are having Islamic and Conventional set-ups under one umbrella i.e. Board / Management etc. Thus, their decisions in favor of Islamic Banks seems somewhat compromised keeping in view the market share, hold and easiness of conventional banking. Moreover, the rationale behind selecting this period (2011-2020) was that Islamic banking in Pakistan started since 2000, as such, the first decade was considered as development phase whereas, in the selected decade Islamic Banks have grown into independent financial institutions and witnessed considerable growth both in terms deposit, assets and market share, besides, many reforms, rules, and regulations were also introduced by AAOIFI and SBP during this period.

Data Collection

Bank's specific quantitative data with regard to the dependent variable (ROA, ROE & Default Ratio) & independent variables (MF, IJF, DM, RM, etc.) have been collected from the annual financial statements for last 10 years (2011-2020) of selected Islamic Banks. The collected data from the financials of each bank, was then consolidated variable-wise. Whereas, data regarding control variable (SBP Policy Rates) have been collected from SBP website. Control variable has been added to avoid research bias, as SBP Policy Rate act as a base while finalizing yield / return from each Islamic financing mode, whereas it is the respective spread which substantiate one mode from the other.

Description of Research Variables

S. No.	Category	Variables
1.	Dependent Variable	- Return On Assets - Return On Equity - Default Ratio
2.	Independent Variables	- Murabahah Finance - Ijara Finance - Diminishing Musharakah - Running Musharakah - Istisna Finance - Salam Finance - Government Sukuk Finance - Private / Other Sukuk Finance
3.	Control Variable	- SBP Policy Rate

Econometric Model

In order to complete this research following linear econometric models (Gujarati, 2004) have been applied, to measure the impact of financing modes on profitability of selected Islamic Banks:

1. $ROA_{it} = \beta_0 + \beta_1 MF_{it} + \beta_2 IJF_{it} + \beta_3 DM_{it} + \beta_4 RM_{it} + \beta_5 ISF_{it} + \beta_6 SF_{it} + \beta_7 GSFit + \beta_8 PSFit_{it} + \epsilon$
2. $ROE_{it} = \beta_0 + \beta_1 MF_{it} + \beta_2 IJF_{it} + \beta_3 DM_{it} + \beta_4 RM_{it} + \beta_5 ISF_{it} + \beta_6 SF_{it} + \beta_7 GSFit + \beta_8 PSFit_{it} + \epsilon$
3. $DR_{it} = \beta_0 + \beta_1 MF_{it} + \beta_2 IJF_{it} + \beta_3 DM_{it} + \beta_4 RM_{it} + \beta_5 ISF_{it} + \beta_6 SF_{it} + \beta_7 GSFit + \beta_8 PSFit_{it} + \epsilon$

Where,

ROA_{it}	represent	Return on Assets
ROE_{it}	represent	Return on Equity
DR_{it}	represent	Default Ratio or NPL Ratio
MF_{it}	represent	Murabaha Finance
IJF_{it}	represent	Ijara Finance
DM_{it}	represent	Diminishing Musharkah
RM_{it}	represent	Running Musharkah
ISF_{it}	represent	Istisna Financing
SF_{it}	represent	Salam Financing
GSFit	represent	Government of Pakistan Sukuk Financing
PSFit	represent	Private Sukuk Financing

Results, Findings & Analysis

Discussion

Since the data-set of this research is panel data, therefore the Fixed and Random Effect Model has been applied to observe the behavior of dependent variables i.e. Return on Asset, Return on Equity and Default Ratio against independent variables (MF, IJF, DM, RM, ISF, SF, GS, PS) over a time period of 10 years. Accordingly, Hausman Test has been applied which shows that the P-Value > 0.05, therefore, the null hypothesis has not been rejected, as such, the Random Effect Model is an appropriate choice, as all the variables across selected Banks are identical that vary over time only and are having a common effect on dependent variables.

Generalized Least Squares (GLS) Regression Analysis (Fixed and Random Effect Test)

	(RE) NROA	(FE) NROA	(RE) NROE	(FE) NROE	(RE) NDR
NLNIJF	.077 (.264)	.197 (.259)	.183 (.243)	.179 (.267)	-0.010 (0.006)
NLNMF	.308* (.174)	.139 (.155)	.144* (.16)	.038 (.16)	0.008 (0.009)
NLNDM	-.544* (.32)	-.229 (.465)	-.257* (.295)	-.251 (.48)	0.040*** (0.009)
NLNRM	.166 (.188)	-.013 (.187)	.278 (.173)	.192 (.193)	0.004 (0.003)
NLNISF	.476** (.238)	.024 (.282)	.294* (.219)	-.096 (.291)	-0.029*** (0.006)
NLNGS	.233 (.203)	.269 (.195)	.213 (.187)	.18 (.202)	-0.003 (0.004)
NLNPS	.542*** (.192)	.05 (.227)	.529*** (.177)	.174 (.235)	-0.019*** (0.005)
NLNSF	-.149 (.126)	-.26 (.23)	-.148 (.116)	-.299 (.237)	-0.001 (0.002)
NSBPRATE	-.069 (.44)	-.181 (.195)	.047 (.405)	-.142 (.202)	

_cons	-.051 (.434)	-.157 (.395)	-.281 (.399)	-.153 (.408)	0.020 (0.033)
Observations	40	40	40	40	40
R-squared	.z	.65	.z	.588	0.615
Hausman Test (Chi ²)	-	20.36	-	6.93	
Probability>Chi ²		0.1193		0.9373	

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

The results presented in above table show that a unit change in independent variables causes 0.65 points variation in ROA and 0.588 points change in ROE. These results further show that the impact of most of the financing modes on dependent variables is statistically insignificant except MF, ISF, and PS. These findings are in line with previous study which proved significant positive impact of financing modes on ROA in Kenya (Boyant, 2014). The results further show that DM is having a significantly negative impact on ROA at P-Value < 0.1 , as a unit change in DM, causes, a negative change of 0.544 unit in ROA. Similarly, it also has a significantly negative impact on ROE at P-Value < 0.1 , as a unit change in DM, causes on the average -0.257 unit change in ROE. These findings support one of our Hypothesis i.e. H4 which says that DM has a significantly positive or negative impact on ROA & ROE. On the other hand, the results show that MF has a significantly positive impact on both ROA & ROE with P-value < 0.1 , as a unit change in MF, brings about on the average 0.308 points change in ROA and 0.144 points change in ROE. Thus, hypothesis H1 has been accepted. Likewise, ISF also has a significantly positive impact on ROA at P-value < 0.05 , as a unit change in Istisna Financing, causes, on the average 0.476 points change in ROA, while it is causing 0.294 points to change in ROA at P-value < 0.1 . Thus, another hypothesis i.e. H5 is accepted. Moreover, the results further suggest that another independent variable i.e. Private Sukuk is having a significantly positive impact on dependent variables ROA & ROE with P-value < 0.01 , as a unit change in PS brings, on average about 0.542 points change in ROA and 0.529 points change in ROE. These results support H8, which is accepted. The results also suggest that other independent variables like IJF, RM and GS are having a positive impact on dependent variables (ROA & ROE), however, these results are not significant. Similarly, the other two variables such as SF and SBP Policy rates are having a negative insignificant impact on ROA & ROE of selected Islamic Banks such as a unit change in SF causes -0.149 & -0.69 change in ROA and -0.148 in ROE. Thus, the other hypothesis like H2, H3, H6 & H7, are rejected. The results also confirm that DM is having a significantly positive impact on Default Ratio with P-value < 0.01 , as a unit change in DM, causes on the average 0.040 points change in Default Ratio. This means that increase in DM is contributing towards the increase in default which is not a good sign. Moreover, ISF has a significantly negative impact on Default Ratio with P-value < 0.01 , as a unit change in ISF, is causing on the average -0.029 points change in DR. This is a good sign, as increase in this financing mode causes reduction in default. Similarly, Private Sukuk is also having a significantly negative impact on Default Ratio, as one-unit change in PS is resulting on the average -0.019 points change in DR, which is also a good sign with regard to its performance. In addition, the other financing modes such as IJF, GOP Sukuk, and SF are having a negative impact on the DR, however, these findings are not statistically significant.

Pearson's Correlation

	NROA	NROE	NDR	NSBP Rate	NLN (IJF)	NLN (MF)	NLN (DM)	NLN (RM)	NLN (ISF)	NLN (GS)	NLN (PS)	NLN (SF)
ROA (1)	1											
ROE	.951**	1										
DR	-.587**	-.712**	1									
NSBP Rate	0.057	0.083	-0.055	1								
NLN IJF	.522**	.627**	-.435**	-0.067	1							
NLN MF	.405**	.364*	-0.227	-0.210	.672**	1						
NLN DM	.332*	.489**	-.406**	0.013	.460**	0.297	1					
NLN RM	.579**	.656**	-.497**	-0.063	.380*	-0.015	.459**	1				
NLN ISF	.510**	.616**	-.489**	0.024	.641**	0.249	.807**	.648**	1			
NLN GS	.493**	.604**	-.368*	0.131	.529**	0.310	.471**	.338*	.499**	1		
NLN PS	.505**	.588**	-.437**	0.256	.535**	0.230	.717**	.436**	.631**	0.227	1	
NLN SF	0.011	0.067	-0.225	-0.222	0.298	0.274	.405**	0.050	0.303	0.088	.326*	1

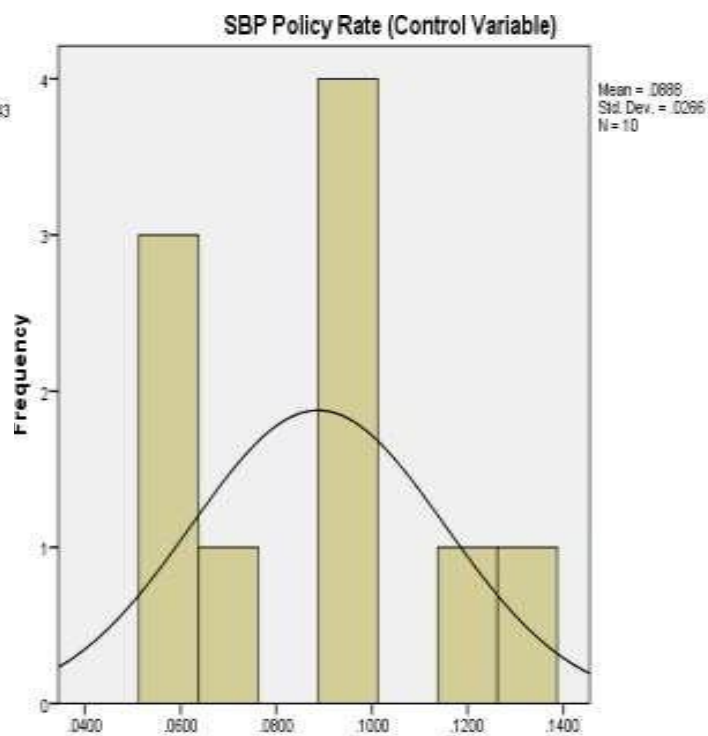
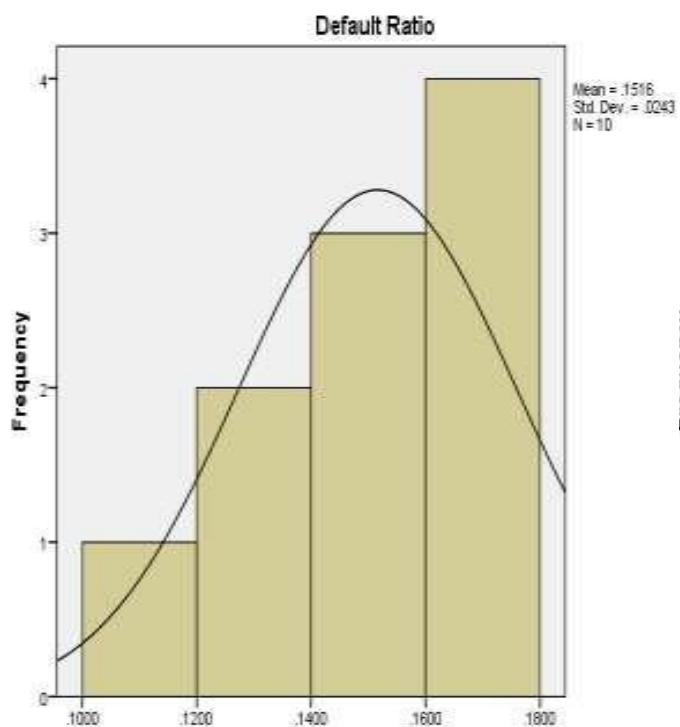
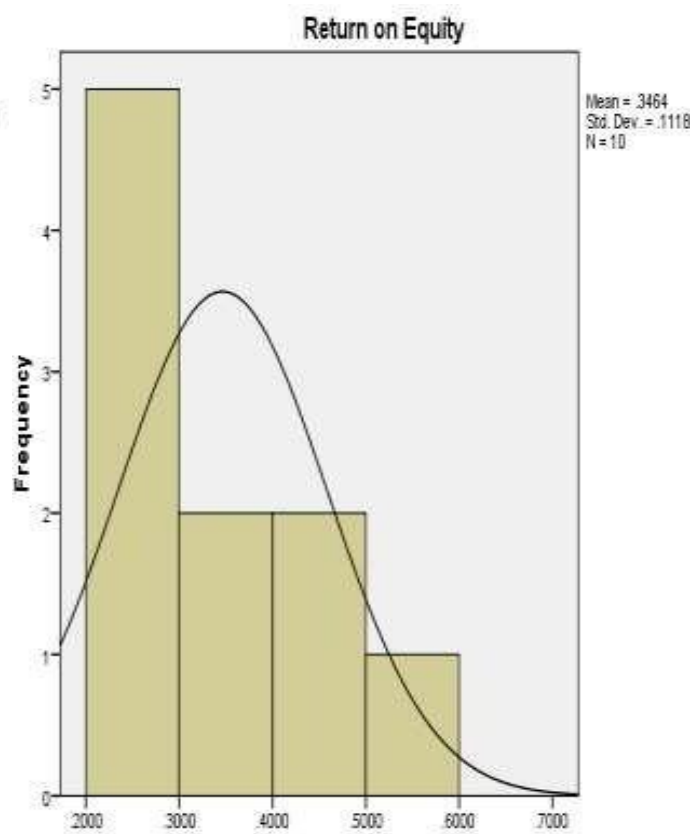
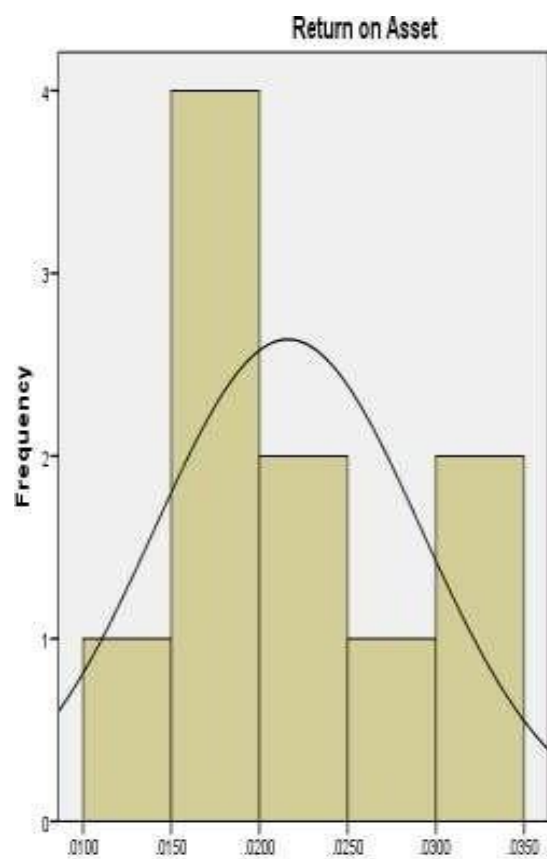
** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The results of Pearson's correlation presented in above table indicate that there exists an association among most of the variables at a P-value < 0.01. The results of Pearson's Correlation further indicate that there is a strong relationship between IJF and ROA with an R-value of 0.522 at P-value < 0.01. Results also shows that IJF is having a strong relationship with ROE at coefficient of 0.627 at a P-value < 0.01. Similarly, ROA & ROE are also having a strong relationship with RM having a coefficient of 0.579 and 0.656, respectively, at P-value < 0.01. Moreover, ISF & PS are also having direct significant relationship with ROA & ROE with R-values of 0.510 & 0.616 and 0.505 & 0.588 points. These significant strong relationships indicate that an increase or decrease in above mentioned independent variables is causing an increase/decrease independent variables. Besides, SF and SBP Policy rate (control variable) have a weak insignificant relationship with ROA & ROE with R-value of 0.011 & 0.067 and 0.057 & 0.083 points. Default Ratio (DR), on the other hand, is having a significantly negative relationship with all the financing modes like IJF, DM, RM, ISF, GS, PS & SF, with R-values of -0.435, -0.406, -0.497, -0.489, -0.368, -0.437. This negative relationship is also a good omen for Islamic Banks as an increase in said financing modes will have a negative impact on Default Ratio (DR). Further, the other two independent variables i.e. SF and SBP Policy Rates are having a negative but statistically insignificant relationship with Default Ratio (DR). Descriptive statistics of dependent and control variable is presented in the below table, which shows that the mean value of ROA is 0.022 while minimum and the maximum value is 0.014 and 0.034 which indicates that ROA remains stable during the period. Similarly, the average mean value of ROE is 0.35 while the minimum and maximum values are 0.0229 and 0.582, which suggest a steady ROE over the last 10 years. Likewise, the mean value and SD of DR are 0.152 and 0.0243 while the minimum & maximum values are 0.100 and 0.176.

**Descriptive Statistics of Return on Assets, Return on Equity,
Default Ratio and SBP Policy Rate**

		Return on Asset	Return on Equity	Default Ratio	SBP Policy Rate (Control Variable)
N	Valid	10	10	10	10
	Missing	0	0	0	0
Mean		0.022	0.346	0.152	0.089
Median		0.020	0.319	0.158	0.095
Mode		0.0138 ^a	0.2293 ^a	0.1003 ^a	0.0575 ^a
Std. Deviation		0.008	0.112	0.024	0.027
Variance		0.000	0.013	0.001	0.001
Skewness		0.748	1.062	-1.058	0.194
Std. Error of Skewness		0.687	0.687	0.687	0.687
Kurtosis		-1.077	0.700	0.738	-1.113
Std. Error of Kurtosis		1.334	1.334	1.334	1.334
Range		0.020	0.353	0.076	0.075
Minimum		0.014	0.229	0.100	0.058
Maximum		0.034	0.582	0.176	0.133
Sum		0.216	3.464	1.516	0.888
Percentiles	25	0.015	0.262	0.136	0.059
	50	0.020	0.319	0.158	0.095
	75	0.030	0.425	0.172	0.105

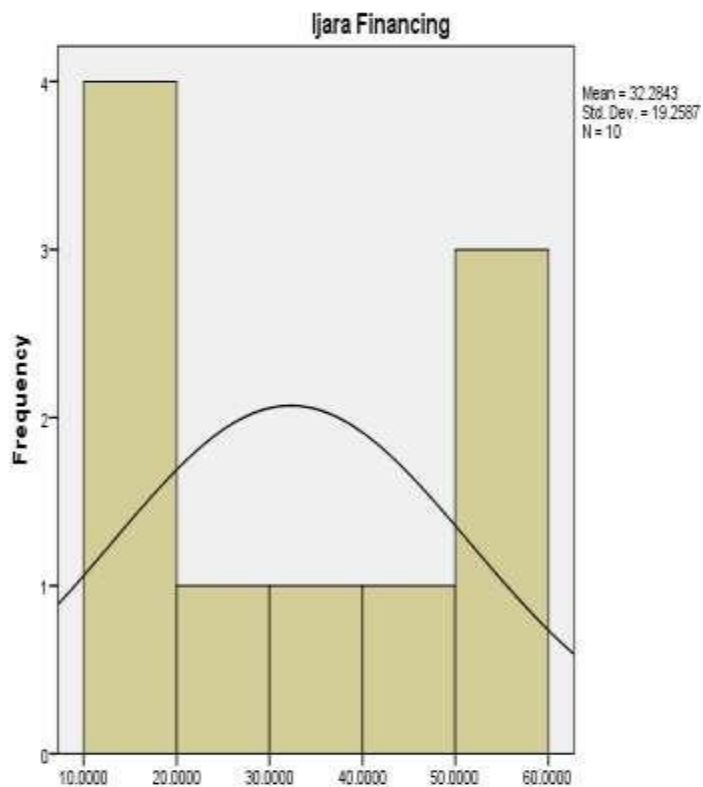
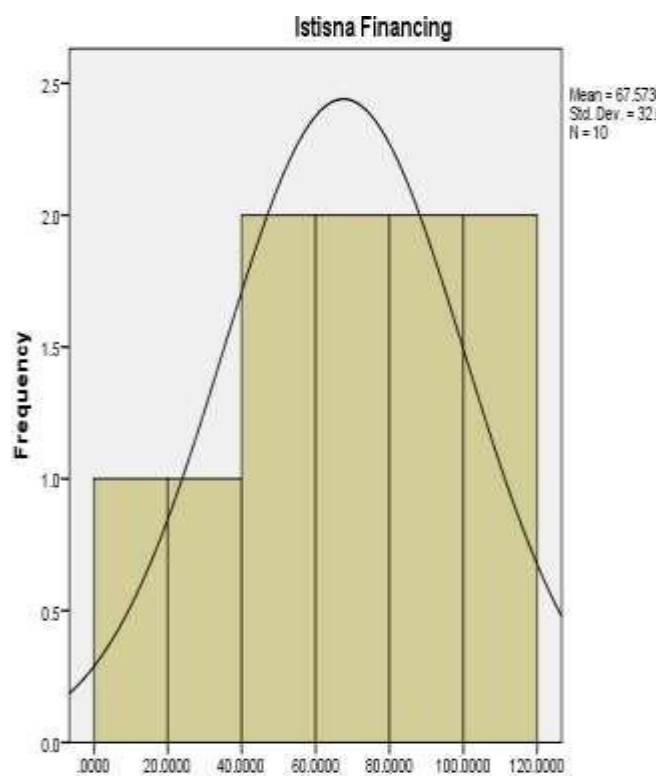
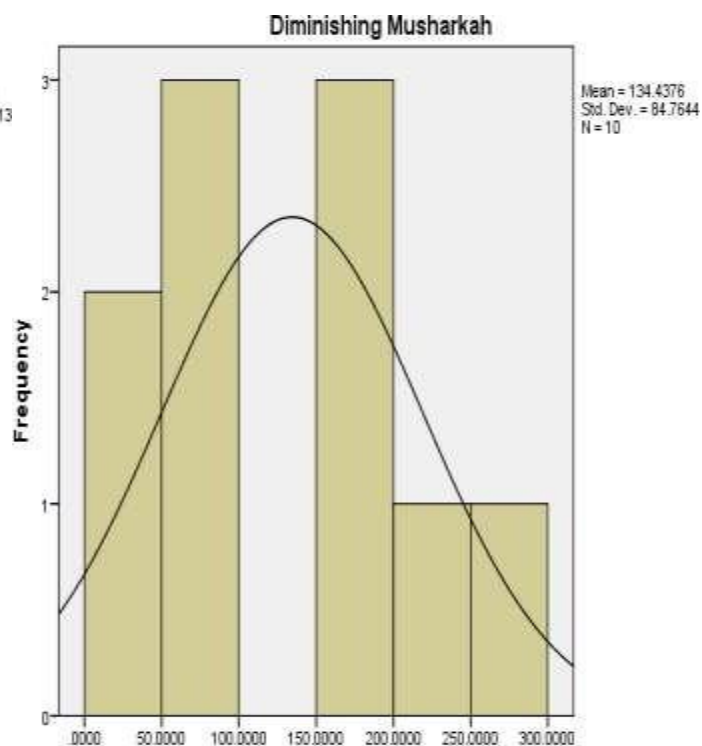
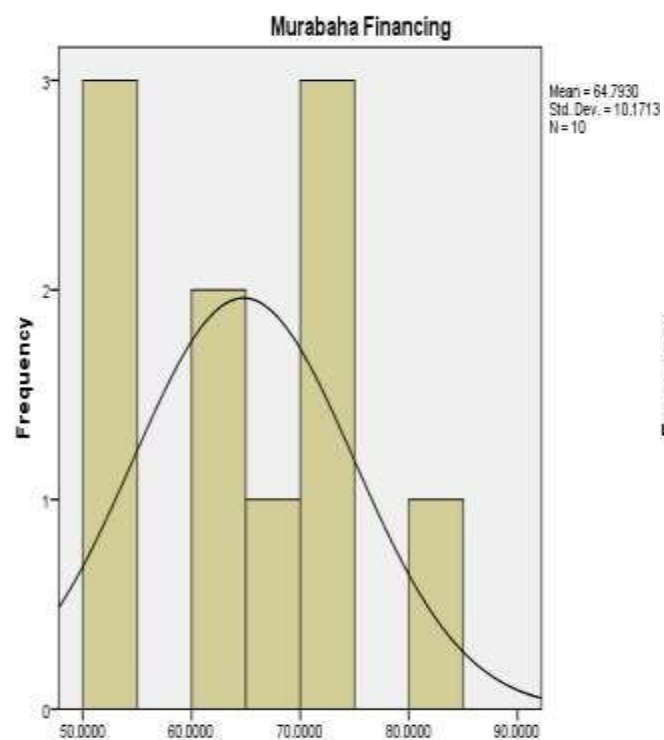


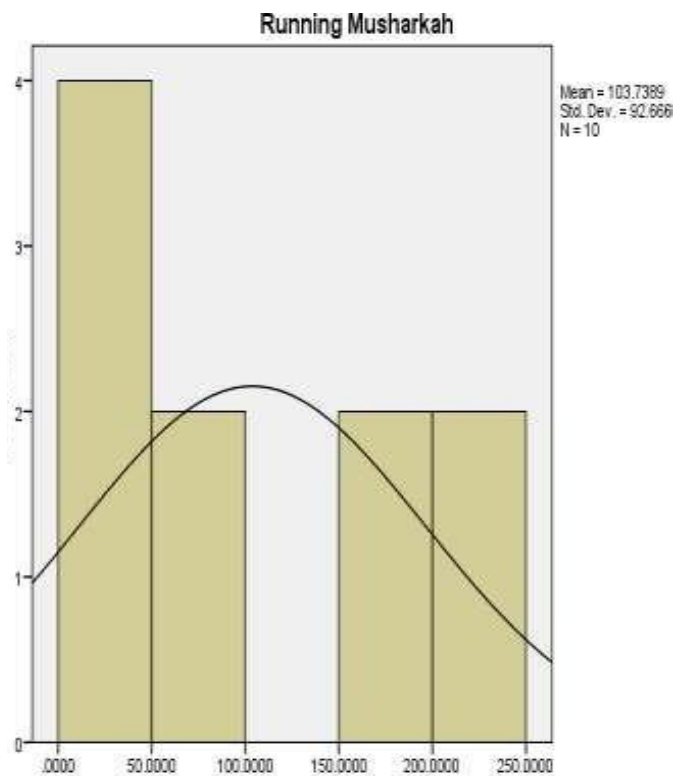
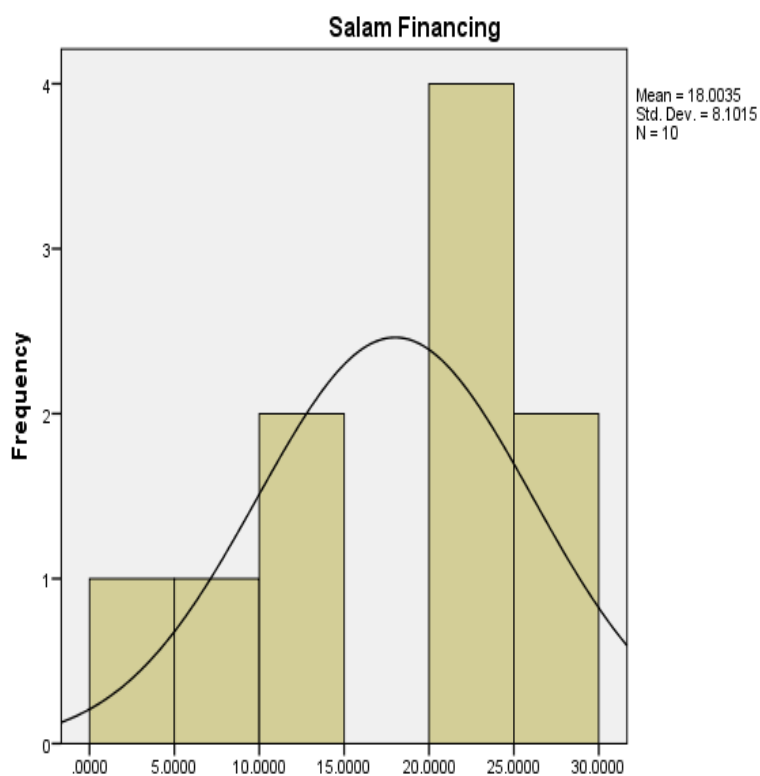
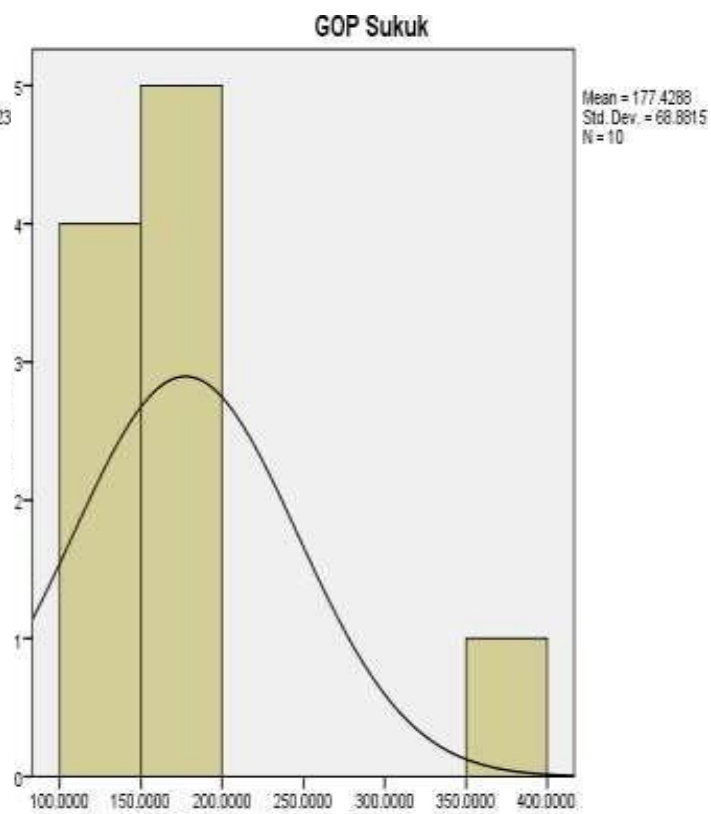
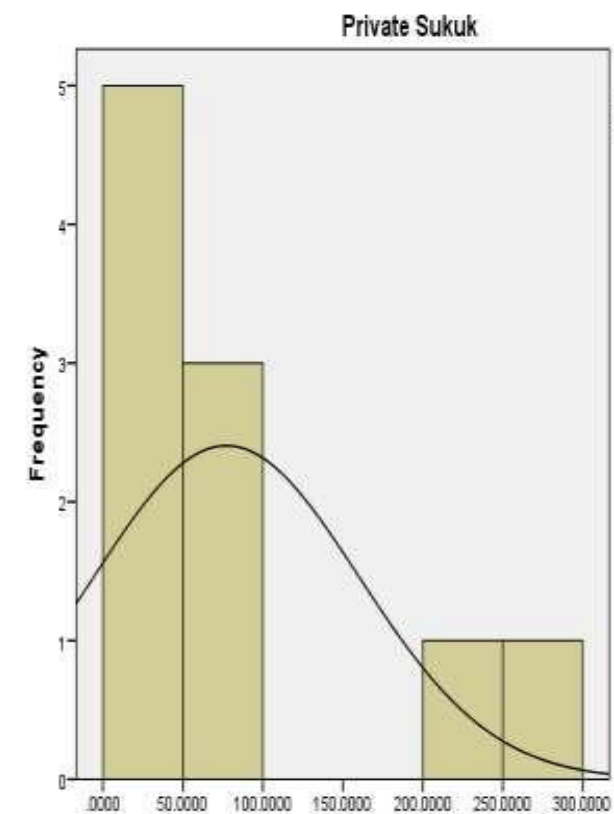
The descriptive statistics of all independent variables are presented in the below table which shows that the average mean value of IJF is 32.284, Standard Deviation is 19.259 while the minimum & maximum values are 11.495 and 58.435. This indicates a gradual decrease in its share over the period. Similarly, the mean value of MF is 64.79, Standard Deviation is 10.17 while minimum & maximum values are 52.17 & 81.32, which is an indication that it has a decent share in the overall gross financings of IBIs. Moreover, the mean value of DM is 134.44 and SD 84.764 while the minimum & maximum values are 36.92 and 281.48, this suggests that DM is has maintained a hefty market share over the last 10 years. Further, the mean value of RM is 103.739, SD 92.666 and minimum & maximum values are 3.750 & 222.7934. This indicates that with the passage of time RM has gained momentum and captured market share.

Besides, the ISF mean value is 67.57, SD is 32.6899, whereas, the minimum & maximum values are 19.92 & 111.170. this indicates fluctuation in the market share of ISF over the period. In addition to the above, the results show that GOP Sukuk has a mean value of 177.429, SD is 82.94 while minimum & maximum values are 122.72 & 362.45, whereas, its skewness is 2.536 which suggest that investment in these Sukuk has increased considerably during last 05 years. Likewise, the mean value of Salam Financing is 18.003 with an SD value of 8.102 while minimum & maximum values are 4.74 & 27.61, while its skewness is -0.604. This indicates that a slight reduction has occurred in its market share.

Descriptive Statistics of all Independent Variables

		Ijara Financing	Murabaha Financing	Diminishing Musharkah	Running Musharkah	Istisna Financing	GOP Sukuk	Private Sukuk	Salam Financing
N	Valid	10	10	10	10	10	10	10	10
	Missing	0	0	0	0	0	0	0	0
Mean		32.284	64.793	134.438	103.739	67.574	177.429	77.275	18.004
Median		27.996	64.150	129.545	77.847	63.799	157.289	46.642	20.564
Mode		11.4953 ^a	52.1713 ^a	36.9232 ^a	3.7500 ^a	19.9233 ^a	122.7244 ^a	20.8582 ^a	4.7438 ^a
Std. Deviation		19.259	10.171	84.764	92.667	32.690	68.881	82.942	8.102
Variance		370.898	103.456	7185.009	8587.105	1068.633	4744.659	6879.430	65.635
Skewness		0.326	0.149	0.471	0.253	-0.087	2.536	1.784	-0.604
Std. Error of Skewness		0.687	0.687	0.687	0.687	0.687	0.687	0.687	0.687
Kurtosis		-1.795	-1.286	-1.058	-2.037	-1.180	7.196	1.890	-0.995
Std. Error of Kurtosis		1.334	1.334	1.334	1.334	1.334	1.334	1.334	1.334
Range		46.940	29.150	244.562	219.043	91.247	239.723	236.765	22.863
Minimum		11.495	52.171	36.923	3.750	19.923	122.724	20.858	4.744
Maximum		58.436	81.322	281.485	222.793	111.170	362.447	257.624	27.607
Sum		322.844	647.930	1344.376	1037.389	675.736	1774.288	772.748	180.035
Percentiles	25	13.597	54.094	55.236	11.863	38.469	142.347	27.536	11.007
	50	27.996	64.150	129.545	77.847	63.799	157.289	46.642	20.564
	75	54.040	72.930	205.254	200.090	100.499	187.814	91.802	24.465





CONCLUSION

The main objectives of this research was to analyze the impact of different financing modes on financial performance of Islamic Banks, for which four full- fledged Islamic Banks (MBL, BIPL, DIBP & ABPL) were selected as sample. To conduct the research, Return on Assets, Return on Equity & Default Ratio were used as dependent variables while financing modes i.e. Murabaha, Ijara, Running Musharkah, Diminishing Musharkah, Istisna, Salam, Govet. Sukuk, Private Sukuk were taken as independent variables.

The findings of this research shows that Random Effect Model is an appropriate choice as the Hausman Test shows the P-Value > 0.05, which suggests that the null hypothesis has not been rejected. The results further indicate that Murabahah Financing (MF), Istisna Financing (ISF), and Private Sukuk Financing (PS) are having a significantly positive impact on Return on Assets (ROA) and Return on Equity (ROE). The results further suggest that Istisna Financing and Private Sukuk Financing are having significantly negative impact on Default Ratio. These findings suggest that a unit increase in these 03 financing modes will significantly increase their financial performance.

Results further indicate that DM, is having a negative relationship with ROA & ROE, at P-value < 0.1, while Salam Financing and SBP Policy Rate (control variable) are having a negative but insignificant relationship with ROA & ROE. Besides, other financing modes like Ijarah, RM, and GOP Sukuk are also having a positive impact on ROA & ROE, but these results are not significant.

Policy Recommendations

The findings of this research prove that Murabahah, Istisna, and Private Sukuk financings are having significantly positive impact on Return on Assets and Return on Equity while on the otherhand Default Ratio are having a significantly negative relationship with these financing modes. Therefore, Islamic Banks should focus more on these aspects in order to further improve their financial performance, as these are yielding higher returns with lesser risk (chances of default).

Limitations of the Study

This study has considered the data of four (04) full-fledged Islamic Banks for the last 10 years (2011-2020) as a sample. Although MCB Islamic Bank is an independent Islamic Bank, however, its data for the selected period (2011-2020) was not available, hence it was excluded. Moreover, although, financing modes contributes lion share towards financial performance, yet, there are other sources of income generation which cannot be ignored such as now days Banks both Conventional & Islamic generate a considerable amount of earnings from treasury operations, investments in stock exchange and other non-financial earnings like fee, commission, service charges etc. which have not been considered in this research.

Suggestions for Further Research

For future research it is suggested to include more Banks in the sample list, especially, conventional banks having standalone IBBs, as presently there are 17 such Banks operating in Pakistan under the license of the State Bank of Pakistan. These IBBs are holding a significant percentage of market share, not only in terms of deposit but also in the shape of financings as well as Branch networks.

References

- Almanaseer, S. R., & Alslehat, Z. A. (2016). The Impact of Financing Revenues of the Banks on their Profitability. *European Journal of Business and Management*, 8(12), 195–202.
- Asif, M., Ahmed, U., Zahid, M., & Khan, A. (2017). Motives Behind the Transfer of a Bank from Conventional Banking to Islamic Banking in Pakistan. *Journal of Business and Tourism*, 3(2), 225–234.
- Ahmad, A. Y. (2016). Does Islamic Banking help in Economic Development of Muslim Countries? *Journal of Islamic Business and Management*, 7(1), 19-37.

- Al-tirmidhi, M. I. (864/5). Jami at Tirmidhi 2416.
- Ayub, M. (2017). Liquidity Management by Islamic Banks: An issue or a Contrivance for Risk- Free Return. *Journal of Islamic Business and Management*, 7(1),7-18.
- Ali, M. A. (2015). The Roots & Development of Islamic Banking in the World and In Pakistan. South East Asia *Journal of Contemporary Business, Economics and Law*, 7(1).
- Alzoubi, T. (2018). Determinants of bank profitability: Islamic versus Conventional Banks. *Banks and Bank Systems*, 13(3), 106-113.
- Anwar, J., & Jadoon, M. (2018). Islamic Banking in Pakistan: Analysing Growth and Determinants of Profitability. *COMSATS Journal of Islamic Finance*, 3(1).
- Ayub, M. (2016). Focusing on Sharī'ah Governance in Regulating the Islamic Banking Institutions. *Journal of Islamic Business and Management (JIBM)*, 6(2), 1–10.
- Ali, M. (2015). Macroeconomic Determinants of Islamic Banks Profitability in Pakistan: a time series analysis. *Journal of Business Strategies*, 9(2), 83–97.
- Belkhaoui, S., Alsagr, N., & van Hemmen, S. F. (2020). Financing modes, risk, efficiency and profitability in Islamic banks: Modeling for the GCC countries. *Cogent Economics & Finance*, 8(1), 1750258.
- Bakar, S., & Yi, A. N. C. (2016). The impact of psychological factors on investors' decision making in Malaysian stock market: a case of Klang Valley and Pahang. *Procedia Economics and Finance*, 35, 319-328.
- Bakhita, H. (2017). Impact of Islamic modes of finance on economic growth through financial stability. *Journal of Business & Financial Affairs*, 6(1), 1-7.
- Banerjee, B. (2015). *Fundamentals of financial management*. PHI Learning Pvt. Ltd..
- El-Gamal, M. A. (2000). *A basic guide to contemporary Islamic banking and finance* (Vol. 1). Houston, TX: Rice university.
- Gujarati, D. N. (2004). Basic Econometrics (fourth edi). New Yok: McGraw-Hill Inc.
- Gul, S., Irshad, F., & Zaman, K. (2011). Factors Affecting Bank Profitability in Pakistan. *Romanian Economic Journal*, 14(39).
- Jawadi, F., Jawadi, N., & Louhichi, W. (2014). Conventional and Islamic stock price performance: An empirical investigation. *International Economics*, 137, 73-87.
- Hussain, M., Shahmoradi, A., & Turk, R. (2016). An overview of Islamic finance. *Journal of International Commerce, Economics and Policy*, 7(01), 1650003.
- Ijaz, M. (2012). Islamic Modes of Financing. *Al-Azva*, 27(37), 33-39.
- Islamic Financial Services Board. (2015). Islamic financial services industry stability report.
- Rabaa, B., & Younes, B. (2016). the Impact of the Islamic Banks Performances on Economic Growth: Using Panel Data. *International Journal of Economics and Finance Studies*, 8(1), 101–111.
- Khan, T., Ahmad, W., Rahman, M. K. U., & Haleem, F. (2018). An investigation of the performance of Islamic and interest based banking evidence from Pakistan. *HOLISTICA– Journal of Business and Public Administration*, 9(1), 81-112.
- Kavitha, C. (2015). Investors Attitudes Towards Stock Market Investment. *International Journal of scientific research and management (IJSRM)* 3(7), 3356-3362..
- Kasmani, M. R. (2014). *Factors Influencing the Growth of Islamic Banks in Kenya* (Doctoral dissertation, United States International University-Africa).
- Khan, M. M., & Usman, M. (2016). Corporate social responsibility in Islamic banks in Pakistan. *Journal of Islamic Business and Management*, 6(2), 179-190.
- Markowitz, H. M. (1991). Foundations of portfolio theory. *The journal of finance*, 46(2), 469-477.
- Mokhtar, H. S. A., Abdullah, N., & Alhabshi, S. M. (2008). Efficiency and competition of Islamic banking in Malaysia. *Humanomics*, 24(1), 28-48.

- Muhammad Tariq Majeed, A. Z. (2017). Financial Performance of Islamic Banks in Pakistan. *Kashmir Economic Review*, 26(2), 10–32.
- Khan, M. M. S., Ijaz, F., & Aslam, E. (2014). Determinants of Profitability of Islamic Banking Industry: An Evidence from Pakistan. *Business & Economic Review*, 6(2), 27–46.
- Ahmed, A. M. (2015). The Effect of Islamic Banking Contracts on The Financial Performance Of Islamic Commercial Banks In Kenya (Doctoral dissertation, University of Nairobi).
- Fayed, M. E. (2013). Comparative performance study of conventional and Islamic banking in Egypt. *Journal of Applied Finance and Banking*, 3(2), 1.
- Naqvi, N. A., & Perveen, A. (2014). Analysis of Growth of Ijara Investment in Pakistan (A case study on Meezan Bank). *KASBIT Business Journal*, 7(2), 21-34.
- Noman, A. H. M. (2015). An empirical investigation of profitability of Islamic banks in Bangladesh. *Global Journal of Management and Business Research*, 15(4), 10-22.
- Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International journal of economics and financial issues*, 3(1), 237-252.
- Possumah, B. T., & Ahmat, N. (2018). Net profit margin determinants of Islamic subsidiaries of conventional banks in Malaysia. *Jurnal Ekonomi Malaysia*, 52(2), 163-173.
- Arshad, R., Othman, S., & Othman, R. (2012). Islamic corporate social responsibility, corporate reputation and performance. *International Journal of Economics and Management Engineering*, 6(4), 643-647.
- Sabir, S. (2008). Prospects of Ijarah in Banking Sector of Pakistan. *Available at SSRN 1308826*.
- Samad, A. (2004). Performance of interest-free islamic banks VIS-À-VIS interest-based conventional banks of Bahrain. *International Journal of Economics, Management and Accounting*, 12(2).
- Samhan, H. M., & Al-Khatib, A. Y. (2015). Determinants of financial performance of Jordan Islamic bank. *Research Journal of Finance and Accounting*, 6(8), 37-47.
- SBP. (2012, 11 19). www.sbp.org.pk. Retrieved 08 27, 2021, from <https://www.sbp.org.pk/ibd/2012/C3-Annex.pdf>
- SBP. (January - March 2021). *Islamic Banking Bulletin*. State Bank of Pakistan.
- Staff, B. M. (2013). MASB Islamic Finance Master Class Leases / Ijarah By MASB Staff. November.
- Shaikh, S. A. A. (2012). Analysis of Islamic Mutual Funds Operations in Pakistan. *Journal of Islamic Banking & Finance*, 29(3).
- Nagaoka, S. (2012). Critical overview of the history of Islamic economics: Formation, transformation, and new horizons. *Asian and African area studies*, 11(2), 114-136.
- Zaman, S. J. J. A. K. (2011). Determinants of bank profitability in Pakistan: Internal factor analysis. *Yaşar Üniversitesi E-Dergisi*, 6(23), 3794.
- Khan, T., Ahmad, W., Rahman, M. K. U., & Haleem, F. (2018). An investigation of the performance of Islamic and interest based banking evidence from Pakistan. *HOLISTICA—Journal of Business and Public Administration*, 9(1), 81-112.
- Usmani, M. M. T. (2021). *An introduction to Islamic finance* (Vol. 20). Brill.
- Zulkhibri, M. (2018). The impact of monetary policy on Islamic bank financing: bank-level evidence from Malaysia. *Journal of Economics, Finance and Administrative Science*, 23(46), 306-322.
- Zainordin, N. A., Selvaraja, M., Man, N. Y., & Hoong, L. S. (2016). Challenges and opportunities of Islamic banking and financial institutions in Malaysia. *South East Asia Journal of Contemporary Business, Economics and Law*, 10(1), 1-30.
- Rehman, Z. U., Zahid, M., Rahman, H. U., Asif, M., Alharthi, M., Irfan, M., & Glowacz, A. (2020). Do corporate social responsibility disclosures improve financial performance? A perspective of the Islamic banking industry in Pakistan. *Sustainability (Switzerland)*, 12(8), 3302.

Infrastructure Development (Non-Physical), Economic Growth and Policy Choices: A Cross-Country Analysis

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Abstract

The relationship between the non-physical infrastructure and development has always been an eye catching issue. The following study inspects the influence of non-physical infrastructure on economic growth of Asian countries. Countries from where data is selected for examination are China, India, Bangladesh, Iran and Sri Lanka. The data of has been regressed from 1970 to 2019. Unit test technique has been employed and ARDL mechanism was chosen for long term and short-term analysis. The findings explain the substantial relationship between non-physical side of infrastructure development and economic growth. Social infrastructure variables i.e education and health showed positive significant relationship with economic growth. Policy has been recommended for economic growth is based on weightage approach to derive the quantitative value of the variables and then prioritize the sectors in which the government should invest according to the significance of variable.

Keywords: Economic growth, Infrastructure development, Non-Physical Infrastructure.

Introduction

The role of infrastructure for economic development has been well documented in the literature (Aschauer, 1989; Calderon & Servén, 2003; Estache, 2006; Munnell, 1990; Sahoo & Dash, 2008, 2009; World Bank, 1994). Infrastructure development, both economic and social, is one of the major determinants of economic growth, particularly in developing countries. There is a heated debate regarding the relationship between the economic growth versus infrastructure development and its policy implications. Multipurpose studies regarding these issues were conducted since the late 90's. The role of infrastructure is very much important in economic growth over long run. There are two types of infrastructure defined by the researchers Physical Infrastructure and Non-Physical Infrastructure.

In Pakistan insignificant studies have conducted in this saga, due to transitory / weak governance regimes and their policies i.e., transitions from nationalization to privatization, war against terrorism, short run decision makings. The loss Pakistan encountered along the imposed war against terrorism in terms of, loss of financial paucity, deteriorating law and order situations affecting country's basic infrastructure and subsequently impeding economic growth. The studies conducted are less focus on non-physical infrastructure and its implications on economic growth.

Research Problem

Infrastructure investment in Pakistan is less diverted towards non-physical infrastructure i.e. education and health sector. According of previous studies the impact of investment on non-physical infrastructure is more significant with long lasting impact. In the light of this the research problem will look into the factors which are more inclined

towards investment in non-physical infrastructure. So, this have been further operationalized into following research questions.

Research Questions

The previous studies demonstrated the a rather positive relation between the public investment in infrastructure and economic growth. In the light of this there are following research questions.

- Does non-physical infrastructure play significant role in the economic growth?
- What will be the impact of non-physical infrastructure on economic growth in short and long run?

Research Significance:

According to the studies there is a significant role of non -physical infrastructure in economic development. The biggest example of that is China where there is huge government spending in social infrastructure development. The paper published by (Nannan & Jianing, 2012) shows that the non-physical side has its own share when it comes to have an effect on economic growth. The paper has established that non-physical side of infrastructure has more effect on economic growth than that of physical side.

My study will guide the policies regarding non-physical side of infrastructure that may help achieve infrastructural development in future in Pakistan and should be given more weightage when it comes for government to spend for development or how should government focus on the non-physical infrastructure development.

Literature Review

The observed research on effect and the role infrastructure plays in economic growth started after the foundational work by (Aschauer, 1989) where Aschauer reasoned that public spending is reasonably productive, and the decrease in the U.S productivity was in direct relevance to decline in the public infrastructure. Subsequently Munnell (1990), Garcia-Mila and McGuire (1992), Uchimura and Gao (1993), found high output elasticity of public infrastructure investment though comparatively lower than Aschauer.

Further, it has been found that social infrastructure such as education, health, and housing are essential to promote better utilization of physical infrastructure and human resources, thereby leading to higher economic growth and improving quality of life (Hall & Jones, 1999). Another focus in the literature is on optimal and efficient use of infrastructure for economic growth.

Criticizing these earlier studies Hulten (1997) and Canning and Pedroni (2004) emphasize that there is an optimal level of infrastructure maximizing the growth rate and anything above would divert investment from more productive resources, thereby reducing overall growth.

Investment in education also create expansion in the health expenditure. The investment in education leads to the well trained and well-equipped labor force that leads to economic growth (Awais, Kiani, Thas Thaker, Raza, & Qaim, 2021; Nasir, Awais, & Syed, 2017). With that keeping in mind the health sector also effect the labor force in a way that the productivity doesn't get effected so that leads to more work hence increase in the economic growth (Pravesh, n.d.) The paper discussed the previous results and tried to redefine the linkage between the education expenditure and economic growth in the Indian economy. The time series data has been taken of 28 years i.e from 1980 till 2008 for the estimation purpose, econometric modeling has been used. The long-run results show that there is a significant relation present between the education expenditure of government and economic growth. But the ECM technique showed that the impact of the education expenditure per labor has a lesser effect on the economic growth than that of the physical capital per labor. The results depicted that there is 0.28% increase in the GDP of India with an increase of 1% in physical labor per labor. On the other hand there is 0.11% increase in the GDP with an increase in 1% in government expenditure on the education per labor (Saiful Islam, Abdul Wadud Qamarullah Bin Tariq Islam, Abdul Wadud, & Bin Tariq Islam, n.d.), if we discussing about Asian countries we cannot ignore the Bangladesh. As it has the greater GDP among the SARC nation. The cited paper examined the casual relationship between the education and GDP (income). Multivariate approach has been used for estimation of the data that has been chosen from 1976-2003. (Zhang, Zhang, & Lee, 2001) the paper captured

the result of mortality in terms of fertility and what will be the effect of that on the child education investment. There are child policies in China, which helped contain the population of China. The paper showed that there was positive relationship between the mortality decline and economic growth in such a way that mortality decline effect the investment of parents on a child more that help the economy in the future thus cause the economic growth. Islam, (2014) shows the Bangladesh health system heavily rely on government spending for health facilities supply and financing for health sector infrastructure. Health sector receive a little attention from the total resources of Bangladesh economy that means a lot of stubborn issues relating health sector. Only 3% of total GDP of Bangladesh is invested in health sector (WHO). In that investment 34% is financed by the government and 66% from foreign debts that cause inequity. That causes a serious issue in health sector. The assessment of data that is secondary, the paper tried to capture the health issues in the Bangladeshi economy. The result shows that there is high complexity in the health sector of Bangladesh and inefficient labor force. Also, the political instability and inefficient allocation of funds to health sector damaged the health sector. Bangladesh economy has showing positive impact towards achieving MGD4 and MGD5, the health related MDGs. The private sector is growing on small territorial levels providing basic health services. Bangladesh after showing that much progress still lack a descriptive policy regarding primary health sector. The challenges faced by the Bangladesh economy is the lack of leadership and political stability. Only the strong leadership can bring upon the change in the health system and health investment. The policies and the framework that will work more efficiently for the betterment of health and betterment in health facilities for the Bangladeshi population. Likewise, in Iran the studies shows the impact of infrastructure on the economic growth (Review, Sojoodi, Zonuzi, Mehin, & Nia, 2012). The drawback in infrastructure amount in Iran, that became a major issue in less economic growth in developing low income country like Iran. In recent years. There is a raise in infrastructure investment in Iran afterwards. The paper captures the effect of from 1985 to 2008 of infrastructure on economic growth of Iran. ARDL framework has been used for estimation. Infrastructure capital is used as input function into aggregate production function.

In context of Pakistan there is no such study that compromises of the comparison between which should we choose and why would we choose that side of infrastructure. In china a study is made what should we choose physical or non-physical infrastructure (Nannan & Jianing, 2012).

Research Gap

The literature above gives a thorough image of studies that are conducted in different parts of the globe regarding infrastructure development and economic growth. From developed economies to the developing economies. The literature mainly comprises of Physical infrastructure development and its effect whether its long run or short run. There is not much debate whether there physical or non-physical infrastructure should be a priority for a government while making policies. What weightage should be giving according to the effect it having on a particular economy.

The research gap that has identified is that there isn't enough research present that has shown that either infrastructure investment/development can be used as a tool to maintain or increase the rate of economic development and also which side of infrastructure either physical or nonphysical infrastructure should be used in a long run for better economic growth.

Hypothesis

Hypothesis 1

H^0 = There is significant relationship between non- physical infrastructure and other variables defined in study. Also, it can be used in long run for economic development.

H^1 = No significant relationship between non- physical infrastructure and other variables defined in study. Also. It cannot be used in long run for economic development.

Model, Data and Methodology

Research Design

Direction, technique and research design depends upon the types of inquiry in qualitative, quantitative and mix-method approach (Creswell, 2014). This research is directed towards quantitative methods to look at the elements of infrastructure development, economic growth and policy choices by analyzing the indicators in physical and non-physical infrastructure. Researcher has selected descriptive research design for this research because data required for this research is external, secondary taken from World Bank statistics. As this research is based on quantitative research methods with descriptive design; data has been produced and results have been described in tabular form. Data and result have been produced in order to meet the objective of research.

Econometric Model

ARDL model was introduced by Pesaran et al. (2001) in order to incorporate I(0) and I(1) variables in same estimation. The autoregressive model is used for decades to model the economic relationships between economic variables in a single equation. ARDL approach is used for forecasting and to disentangle long run relationship from short run dynamics. Its popularity stems from the fact that cointegration of non-stationary is equivalent to error correction process also there is no need to determine the order of integration amongst the variable in advance. All other approaches require that the variables should have same order of integration. In addition it is statistically much more significant approach for the determination of cointegration relationship in small samples while allowing different optimal lag of variables.

The model for the estimation is ARLD Model. ARLD was used by (Y.Shin, M. Hashem, n.d.) (Richard J. Smith, n.d.) (Z. Khan, Rabbi, Ahmad, & Siqun, 2019).

$$\Delta Y_{GDP(it)} = \alpha_1 Mot_{it} + \alpha_2 Beds_{it} + \alpha_3 Phys_{it} + \alpha_4 School(P)_{it} + \alpha_5 School(S)_{it} + \mu_{it} \dots\dots\dots \text{Eq 1}$$

It's a Log-Linear model as the values of GDP Per Capita changed to log values to change it to percentage values. The independent variables are Mortality as Mot, Beds as Beds Per Hospital Per (1000), Physicians (Per 1000) as Phys School Enrollment (Primary) Gross% as School(P), School Enrollment (Secondary) Gross% as School (S). Whereas (i) is cross section and (t) is time from 1970-2019. $\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5$ and λ_6 are coefficient and μ_{it} is the error term.

$$\Delta Y_{GDP(it)} = \lambda_1 Mot_{it} + \lambda_2 Beds_{it} + \lambda_3 Phys_{it} + \lambda_4 School(P)_{it} + \lambda_5 School(S)_{it} + \mu_{it} \dots\dots\dots \text{Eq2}$$

Data

The data will be used, is panel data of last 50 years and 6 countries Pakistan, India, China, Bangladesh, Iran and Sri Lanka. The data source is World Bank.

Results and Interpretation

Table 1.1:

Unit Root Test:

Results of Panel Unit Root Tests		
Levin-Lin-Chu (2002) (LLC)		
Variables	I(0)	I(1)
GDP	0.64672 (0.741)	8.44175 (0.000)
Mortality	-0.71905 (0.2361)	-1.793 (0.428)

Beds per hospital	-1.64734 (0.0497)	-14.0748 (0.000)
Physicians	0.06721 (0.5268)	-9.34557 (0.000)
School enrollment (Primary)	-1.76905 (0.0384)	-8.09466 (0.000)
School enrolment (secondary)	0.50954 (0.6948)	-3.8801 (0.00001)

The results of Table 1.0 illuminate that the variables are integrated at $I(1)$. The results support us to use ARDL Bound Test approach for cointegration.

Table 1.2:

Long Run Analysis:

<i>Long Run Equation</i>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Hospital Beds Per 1000	-0.728308	0.268222	-2.715315	0.0073
Mortality	0.004659	0.001533	3.038937	0.0027
Physicians	0.10085	0.036449	2.766879	0.0063
School Enrollment (Primary)	0.016039	0.007665	2.092606	0.0378
School Enrollment (Secondary)	0.034064	0.010482	3.249924	0.0014

Table 1.1 shows the results for the long run. 1% change in Mortality changes the GDP by 0.004 % as the Mortality is decreasing variable, due to health expenditures and also the research advancements in the medicine and treatments the mortality rate is decreasing in adults that's a booster for the labor power and onwards to the economic growth and productivity. 1% change in Physicians changes the GDP by 0.1008%, physicians work for the economic growth in two ways first, the act as rent seekers that means more the number of physicians more benefit for the economic activity and also more number of physicians means less time of labor force out of work during illness that means less productivity loss so that has direct effect on GDP (Reilly, 2012). 1 % change in School Enrollment (Primary) and School Enrollment (Secondary) effect the GDP 0.016 & 0.031% respectively, increase in school enrollment directly affect the GDP the higher the level of education higher the effect as explained before by the (Afzal et al., 2011). Lastly Beds per Hospital, 1% change in beds per hospital decreases the GDP 0.72 %, as a matter of fact the government spending's on health is stagnant that means ever low number of beds available according to the population increase in the country, also the government hospitals are overcrowded and private hospitals are unaffordable by the public. As developing country, the most population is either middle class or lower middle that means low affordability of private health services and that means overcrowding in government provided facilities leading to unproductivity.

Table 1.3:

Short Run Analysis

Short Run Equation				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
λ	-0.097585	0.037756	-2.584657	0.0105
D(GDP(-1))	-0.044608	0.114935	-0.388116	0.6984
D(MORTALITY(-1))	0.010116	0.009106	1.110955	0.2681
D(PHYSICIANS(-1))	1.320096	1.272394	1.03749	0.3009
D(SCHOOLP(-1))	-0.001722	0.002282	-0.754502	0.4515
D(SCHOOLS(-1))	-0.004351	0.003335	-1.304458	0.1938
C	0.321247	0.160305	2.003968	0.0466
Mean dependent var	0.111017	S.D. dependent var	1.064845	
S.E. of regression	1.257494	Akaike info criterion	-1.431262	
Sum squared resid	281.47	Schwarz criterion	0.074943	
Log likelihood	336.6893	Hannan-Quinn criter.	-0.828477	

Table 1.2 reports the short run findings, major portion of variables show insignificant relationship with the GDP, school enrollment (primary & secondary), physicians, mortality, industry (construction), electricity consumption and energy consumption (oil). The significant variable beds per hospital. λ denotes the speed of adjustment towards the equilibrium or the convergence towards the long-run equilibrium, at every year 9.7% adjustment takes place. Most of the variables shows the negative impact on economic growth, in long-run these variables showed the positive impact on the economic growth. That means sudden boom in the education, health and physical infrastructure don't show any positive impact on economic growth. But in long-term these investment does bear the fruit of economic growth. That means government shouldn't stop investment in education, health, construction industry and energy infrastructure sector.

Conclusion and Policy Recommendations

Conclusion

Infrastructure development plays crucial role in economic growth most importantly non-physical infrastructure. ARDL approach was used to capture the effect of non-physical of infrastructure in long and short term. The results show the significance of both sides of infrastructure. Non-physical variables have positive and significant effect on economic growth in long run except Beds per hospital. Which somehow contradict with the existing studies (Chaudhry et al., 2013), specifically Beds per Hospital. The health expenditure is stagnant for past decade resulting in less investment in the health sector which made the results show negative relation between the variable and the economic growth. Other variable does show the significance and the movement towards the long run equilibrium.

Education sector shows the level wise greater impact on the economic growth and has high response effect towards the government expenditure. Hospital beds show negative effect on economic growth that is arguably opposing the previous findings. Policy Shift is required in health department. The physicians showed the higher impact on growth, as it contains both the health side and the educational side. More physicians mean less time for labor force out of work and basic health services available at the nearest point. from educational point of view that means more research towards cures and health related techniques. Likewise, in China, the growth is

infrastructure lead, according to studies yearly 1500 km roads are added to road infrastructure. If you see the most recent infrastructural development you can see the efficiency on institutional level in infrastructural development, the hospital development in China was remarkable they have taken only days to establish the hospital for the corona cure and many other cure centers. If we can see that example as a benchmark for the Chinese economy and their intuitional values. After the revolution in 1949, the china changed their constitution and move towards communalism. The government started investments in infrastructural development. The investment in infrastructure and the in-education infrastructure has grown greatly. the main example for the educational growth is that all the CEO's around the world in leading software industries are Indians. Also, the multi-national are investing in huge amount in Indian economy. That means high investment in infrastructure. Also, Indian policy according multi-national companies are that you have to share the technology after a decade of the plantation of the industry. India is leading in car industry. Whereas in Pakistan we don't have one car producing domestic company with international recognition. With having highest share of middle class, India has larger share of poverty-stricken population. They need a lot investment in health infrastructure like we do. In contrast to that there is a lot of Indian physicians capturing the international physician's market Hence, India should reconsider its policies to ensure better health infrastructure for its people. As of Bangladesh, the country has been through many ups and downs. From the very start country is been through much loss in political manner.

Policy Recommendations

From the policy perspective the study suggests that investment in non-physical infrastructure contributes positively towards growth. Governments should invest in the sectors like education and health to have a maintained economic growth.

The School enrollment shows that the higher level of education gives the highest growth, so the government spending should be greater towards the higher education. The public health of residents always play a vital role in the development and progress of society The stagnant spending on hospital infrastructure is having negative effect on the economy demanding a drastic change in policy by increasing the spending on Public health investment which will have a positive impact in promoting the development of national health and medical and health undertakings, improving the overall health quality of citizens and promoting the harmonious development of society.

Overall the results suggest that it is necessary to design an economic policy that improves the human capital formation by heavily investing in education sector.

References

- Abbas, F., & Choudhury, N. (2013). Electricity consumption-economic growth Nexus: An aggregated and disaggregated causality analysis in India and Pakistan. *Journal of Policy Modeling*, 35(4), 538–553. <https://doi.org/10.1016/j.jpolmod.2012.09.001>
- Afridi, A. H. (2016). Human Capital and Economic Growth of Pakistan. *Business & Economic Review*, 8(1), 77–86. <https://doi.org/10.22547/ber/8.1.5>
- Afzal, M., Rehman, H. U., Farooq, M. S., & Sarwar, K. (2011). Education and economic growth in Pakistan: A cointegration and causality analysis. *International Journal of Educational Research*, 50(5–6), 321–335. <https://doi.org/10.1016/j.ijer.2011.10.004>
- Ahmed, V., Abbas, A., & Ahmed, S. (2013). Public infrastructure and economic growth in Pakistan: a dynamic CGE-microsimulation analysis. *Infrastructure and economic growth in Asia*, 117.
- Ali, S., Chaudhry, I. S., & Farooq, F. (2012). Human Capital Formation and Economic Growth in Pakistan. In *Pakistan Journal of Social Sciences (PJSS)* (Vol. 32).
- Awais, M., Kiani, A. K., Thas Thaker, M. A. M., Raza, A., & Qaim, S. (2021). Analyzing Nexus between Financial Reforms and Savings in Pakistan: An Econometric Investigation. *International Journal of Innovation, Creativity and Change*, 15(8), 351–365.
- Chaudhry, M. O., Faridi, M., Farooq, F., & Arif, R. (2013). Contribution of Health Outcomes to Economic Growth in Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, 33(2), 281–295.

- Elmi, Z. M., & Sadeghi, S. (2012). Health care expenditures and economic growth in developing countries: Panel co-integration and causality. *Middle East Journal of Scientific Research*, 12(1), 88–91. <https://doi.org/10.5829/idosi.mejsr.2012.12.1.64196>
- Erçelik, G. (2018). The relationship between health expenditure and economic growth in Turkey from 1980 to 2015. *Journal of Politics Economy and Management*, 1(1), 1-8.
- Hassan, M. S., & Kalim, R. (2012). The triangular causality among education, health and economic growth: A time series analysis of Pakistan. *World Applied Sciences Journal*, 18(2), 196–207. <https://doi.org/10.5829/idosi.wasj.2012.18.02.3332>
- Huang, B. N., Hwang, M. J., & Yang, C. W. (2008). Causal relationship between energy consumption and GDP growth revisited: a dynamic panel data approach. *Ecological economics*, 67(1), 41-54.
- Huang, F., Jin, L., & Sun, X. (2009). Relationship between scale of higher education and economic growth in China. *Asian Social Science*, 5(11), 55-60.
- Hulten, C. R. (1997). Infrastructure capital & economic growth: How well you use it may be much more important than how much you have. *NBER working paper*, 5847.
- Munnell, A. H. (1990). Why has productivity growth declined? Productivity and public investment. *New England economic review*, (Jan), 3-22.
- Islam, A. (2014). Health System in Bangladesh: Challenges and Opportunities. *American Journal of Health Research*, 2(6), 366. <https://doi.org/10.11648/j.ajhr.20140206.18>
- Islam, T. S., Wadud, M. A., & Islam, Q. B. T. (2007). Relationship between education and GDP growth: A multivariate causality analysis for Bangladesh. *Economics Bulletin*, 3(35), 1-7.
- Kalemli-Ozcan, S. (2002). Does the Mortality Decline Promote Economic Growth?*. In *Journal of Economic Growth* (Vol. 7).
- Kalemli-Ozcan, S., Ryder, H. E., & Weil, D. N. (2000). Mortality decline, human capital investment, and economic growth. *Journal of development economics*, 62(1), 1-23.
- Khan, M. K., Teng, J. Z., & Khan, M. I. (2019). Effect of energy consumption and economic growth on carbon dioxide emissions in Pakistan with dynamic ARDL simulations approach. *Environmental Science and Pollution Research*, 26(23), 23480–23490. <https://doi.org/10.1007/s11356-019-05640-x>
- Khan, Z., Rabbi, F., Ahmad, M., & Siqun, Y. (2019). Remittances inflow and private investment: a case study of South Asian economies via panel data analysis. *Economic Research-Ekonomska Istrazivanja*, 32(1), 2723–2742. <https://doi.org/10.1080/1331677X.2019.1655464>
- Kusharjanto, H., & Kim, D. (2011). Infrastructure and human development: The case of Java, Indonesia. *Journal of the Asia Pacific Economy*, 16(1), 111–124. <https://doi.org/10.1080/13547860.2011.539407>
- Lau, S. H. P., & Sin, C. Y. (1997). Public infrastructure and economic growth: time-series properties and evidence. *Economic Record*, 73(221), 125–135. <https://doi.org/10.1111/j.1475-4932.1997.tb00986.x>
- Maitra, B., & Mukhopadhyay, C. K. (2012). Public spending on education, health care and economic growth in selected countries of Asia and the Pacific. *Asia-Pacific Development Journal*, 19(2), 19-48.
- Mishra, P. K., & Mishra, S. K. (2015). The Triangulation Dynamics between Education, Health and Economic Growth in India. *Journal of Commerce* (22206043), 7(2).
- Nasir, A. R., Awais, M., & Syed, H. A. (2017). Goal Setting and Job Related Outcomes-Mediations of Employee Engagement and Workplace Optimism in IT Supplier Industry. *Foundation University Journal of Business & Economics*, 2(1), 33-57.
- Pillai N, V. (2008). Infrastructure, Growth and Human Development in Kerala.
- Pravesh. (n.d.). *The Impact of Education Expenditure on India's Economic Growth*. Retrieved from <http://www.education.nic.in/>
- Reilly, M. (2012). Do physicians contribute to economic growth? an empirical analysis.
- Zhang, J., Zhang, J., & Lee, R. (2001). Mortality decline and long-run economic growth. *Journal of Public Economics*, 80(3), 485-507.

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