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Development and validation of a questionnaire to identify the barriers to adopting green transformation

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ABSTRACT

In view of growing environmental concerns, each organisation now places a substantial emphasis on adopting green, sustainable, and responsible investments in addition to increasing profits and promoting environmental harmony. This study's primary objectives are to analyse the value of businesses' green investments and identify the barriers to implementing/adopting green transformation. The questionnaire development process involved a literature review, focus group discussions, expert evaluation, and pilot testing. This article opens up new avenues of research in this area. Consequently, further research could define the observed barriers to green transformation in detail. Furthermore, new research can determine which barriers deserve more consideration and assess their influence on the green transition. In addition, future studies in this field may find new challenges or inventive techniques for overcoming those previously recognised. Hence, green transition could have a good impact on lowering pollutants and mitigating global warming.

Keywords: Green Investments; Sustainable Investments; Eco-Investments; Eco-Investing; Environmental Investment; Barriers

INTRODUCTION

Global economic development and expansion have raised worries about natural resource depletion, increased air pollution, and greater climate change problems (Balsalobre-Lorente, Shahbaz, Roubaud, & Farhani, 2018; Rao & Yan, 2020; Riekhof, Regnier, & Quaas, 2019). Hence, "Going Green" (Clarke, 1994; Rusuli, 2016) is considered a vital step toward environmental sustainability (Bansal & Roth, 2000; Depietri & McPhearson, 2017). Several academics have stated that global economies would not be able to maintain themselves if current rates of natural resource use continue since climate change will also prohibit positive economic growth (Chandio, Jiang, Rehman, & Rauf, 2020; Meidute-Kavaliauskiene, Çiğdem, Vasilis Vasiliauskas, & Yıldız, 2021). Furthermore, in recent decades, several researchers have discussed the need to balance economic development with environmental conservation under the term of green transformation. Globally, addressing climate change would need enormous financial resources. One of the biggest challenges confronting developing and emerging economies is mobilising resources for climate change adaptation (Chenet, Ryan-Collins, & van Lerven, 2021).

Developing countries are already experiencing the effects of climate change that significantly impact people's lives; therefore, green transformation in emerging economies is urgently needed (CICED, 2020). Padilla (2018) also emphasises the importance of green transformation for emerging countries because environmental issues result in serious resource depletion, directly impacting their well-being and earnings due to dependence on natural resources for income and consumption generation. He further states, “future progress cannot be supported by continuing on the same road of environmental destruction as developed countries” (Padilla, 2018).

Society's development requirements and environmental sustainability must be balanced by pursuing a "green transformation" that places "green growth at the centre of development" (OECD, 2018). While that is still in development, the concept of green transformation has piqued interest in recent years, particularly among the development community. Green transformation refers to any investment or loan that considers the environment's impact and seeks to improve environmental sustainability. Sustainable investing is a cornerstone of green transformation standards; decisions on where to put money and how to lend it out are informed by environmental screening and risk assessment (Bhonke & Ulrich, 2019).

Numerous solutions to climate change and environmental problems have been proposed. Sustainable development is the oldest, having been introduced in the 1980s and leading to the green economy in 2012, which has lately led to low carbon ideas and green transformation. (Lederer, Wallbott, & Urban, 2016) also emphasise that global collective action will not be feasible until the dispute over developing, developed, and public vs private sectors is resolved. He believes that the focus should be on establishing common ground beyond these differences to help one another overcome hurdles and that only then would the green transformation be feasible. Although the importance of green transformation has recently increased, barriers to its widespread adoption still exist. Several qualitative studies Licastro & Sergi, (2021) in the USA, Chien, Ngo, Hsu, Chau, & Iram, (2021) in China, Lo & Shiah, (2016) in Taiwan, Deely et al., (2020) in Ireland, Makki, Alidrisi, Iqbal, & Al-Sasi, (2020) in Saudia Arab, Wimala, Akmalah, & Sururi, (2016) in Indonesia, Agyekum, Adinyira, Baiden, Ampratwum, & Duah, (2019) in Gana, have investigated the several barriers hindering towards green transformation.

Due to their qualitative nature, the studies indicate a strong need to identify country-specific barriers and their measurement mechanism. This will help align country-specific goals with SDGs, and a scorecard or survey mechanism will help us indicate whether sustainable measures and their positive impact have spread evenly to all sectors of society. The study is also set forth to bridge the knowledge gap about how the major barriers hinder green transformation in developing countries.

This study aims to fill that research gap by identifying the green transformation barriers through a thorough literature review and by adding an empirical test on the relationship between the barriers and green transformation in all registered firms. These investors encountered difficulties in responding to public and societal concerns about environmental sustainability. The study has identified influential barriers to the implementation of green transformation. Moreover, we have developed and validated scales suitable to measure the identified barriers. Furthermore, the study will significantly help practitioners of green transformation. (CICED, 2020).

Water availability, food production, health, land use, and the natural environment are just some of the fundamentals that are being threatened by the current climate change, and this is becoming increasingly obvious to people throughout the world. This is because these catastrophes are not the only ones that occur around the globe. Growing data indicate that environmental hazards and climate change significantly impact the financial stability of nations throughout the world (EBF, 2019).

The idea of "green transformation" blends the strength of business operations and finance with the strength of environmental conduct. This broad category comprises customers, producers, investors, and lenders in both the individual and commercial sectors. Different forms of green funding can be stated depending on the number of participants. Motives like money or concern for the environment can have a role. However, it may end up doing a hybrid of the two. As opposed to traditional banking practises, green financing places greater emphasis on safeguarding industries while also protecting the environment. Thus, the phrase "green financial system" describes a system of rules and structures, such as lending, private equity, bonds, insurance, and carbon trading, that prioritises investments in projects and activities that reduce negative impacts on the environment.

Literature Review

Over the past decade, the transformation has grown in importance in climate change and sustainability research (e.g. (Feola, 2015; Kates, Travis, & Wilbanks, 2012; Patterson et al., 2017). The realisation that the problems caused by climate change are so large that little, piecemeal remedies are not enough lies at the heart of it. Those that support reform include (Blythe et al., 2018; Kates et al., 2012; Lycourghiotis, Kordouli, Kordulis, & Bourikas, 2021; O'Brien, 2012). A fair and equitable transition that can last is guaranteed. There are many questions and concerns that need to be answered, such as what transformation is, how it happens, how to guarantee it, and who decides what is included and what is left out (Blythe et al., 2018; Feola, 2015). The need for an intentional transformation has been highlighted in this context to democratically and purposefully move society toward sustainability (Fook, 2017; O'Brien, 2012). Although climate change is a relatively recent topic of discussion, ideas and dialogues concerning societal transitions are not (Roberts & Pelling, 2020).

The landmark Paris Agreement firmly established transformation as a global issue, and the Intergovernmental Panel on Climate Change (IPCC) estimate of the consequences of global warming of 1.5 degrees Celsius emphasises the need for transformation to limit global warming below 1.5 degrees Celsius (IPCC, 2018; Wolf, Jaeger, Mielke, Schuetze, & Rosen, 2019). The context of transformation, however, is an empirical issue. The way climate change is conceptualised depends on prevailing ideas and beliefs, which affects the likelihood that transformative solutions will be possible (O'Brien, 2018). Norway is an intriguing case because it is both a big global petroleum exporter and has lofty climate policy goals (Amundsen & Hermansen, 2021; Tellmann, 2012)

The phrase "green transformation" has emerged as a key policy objective in Norway (Amundsen & Hermansen, 2021; Hölscher, Wittmayer, & Loorbach, 2018). The term "green shift" was developed in the Norwegian debate over "green transformation" to address societal responses to climate change (Ytterstad & Bdker, 2022). The phrase was selected as the new word of the year in Norway in 2015, demonstrating its acceptance and

use in popular culture. The January 2019 cabinet declaration's first major policy objective, reads in part, "By restructuring the Norwegian economy, promoting growth and job creation, improving infrastructure nationwide, supporting the transition to a green economy, and ensuring diversification, the government will continue to build a sustainable welfare-based society," uses the related concept of the "green economy" (Ytterstad & Bdker, 2022).

Efficiency is a measure of a company's capacity to maximise profits while minimising negative impacts on the environment, especially in areas like high production rates, low energy use, and little pollution from manufacturing processes. Thus, environmental protection is the primary motivator for environmental legislation's impact on green technology and the key to accomplishing the twin goals of economic growth and environmental protection. However, enterprises would not be able to advance green technologies without financial support (Dechezlepretre & Sato, 2017; Li, Liu, Bai, & Umar, 2020). Social capital is guided, liquidity is established, and firm credibility is bolstered to support green technological advancement and ultimately achieve social progress through the use of finance. Therefore, the availability of funds is a major external factor in the growth of environmentally friendly technologies (Liu, Zhu, Yang, & Wang, 2022; Song, Yang, & Zhang, 2019)

In their 2017 study, Patterson et al. focused on governance systems and the degree to which incrementalism permeates these systems. To address the tension between the need for more significant, transformative changes and the incrementalism of the governance process, they proposed an incremental change strategy with a revolutionary agenda. Instead of one massive green revolution, Shi, Wang, and Chen (2021) argue that there will likely be several changes that will intersect, overlap, and collide in unanticipated ways. This demonstrates the significance of considering the possibilities of co-evolutionary and non-linear outcomes, as well as the changes in multiple interrelated domains (such as social, institutional, political, ecological, technical, and cultural) in ways that are appropriate for the situation.

According to Skjoldager et al. (2021), the themes used in the Norwegian context, such as the "green shift," are more akin to transitional writing than transformational literature. Transitions to sustainable societies are long-term transformation processes including societal structures and organisations to solve persistent difficulties that inhibit sustainability (Nykamp, 2017). Subsystems like energy and food systems, mobility and transportation, and industrial systems have received the bulk of attention in the literature on transitions, as stated by Hölscher, Frantzeskaki, and Loorbach (2019). Socio-technical system transformations are the result of such processes (Geels & Schot, 2007; Geels, 2014; Grubler, 2012; Lawhon & Murphy, 2012; Markard et al., 2012; Rotmans et al., 2001; Whitmarsh, 2012).

The literature on green transformation differs from the transition literature because it has historically concentrated on significant societal changes and their effects (Hölscher et al., 2019). According to Bohnke and Ulrich (2019), transformation, not transition, includes the size of the structural changes in question and the degree of change. Furthermore, increased emphasis is being placed on shifting perspectives and worldviews (Brien, 2012, 2018) as well as cultural development (Agwu, 2019)

Barriers to Green Transformation

Companies confront numerous barriers while implementing green investments, policies, and initiatives into their operations, which may be sluggish and difficult (Teh, Khan, Corbitt, & Ong, 2020). Companies frequently stated their desire to engage in volunteer environmental initiatives, according to Olmedo, Torres, Izquierdo, and Lirio (2017), as long as the procedure was not excessively costly and demanding (Li, Loyalka, Rozelle, & Wu, 2017). However, businesses occasionally aren't aware that there are a lot of financially advantageous solutions for environmental conservation, like tax breaks and government subsidies. (OECD, 2015; Zeng, Cheng, Shi, & Luetkenhorst, 2021). Often, these businesses are preoccupied with improving their production and concentrating only on their product outputs (Escrig-Olmedo et al., 2017). Even while firms are generally aware of the potential for enhancing competitiveness, a lack of required skills and experience frequently hinders them from embracing new prospects (Ansari & Holz, 2020; McCollum et al., 2018)

According to Purwandani and Michaud (2021), management's lack of commitment to green efforts is commonly caused by management's preference for running a business the old-fashioned way and attempting to minimise unforeseen risk from innovation. In addition, according to Purwandani and Michaud (2021), technology and awareness barriers are most prevalent due to resource restrictions that are common inside organisations and among employees. Unlike large corporations that can support technological growth via research and development, small businesses rely on easily accessible technology (Chang & Slaubaugh, 2017; Zhai & An, 2021). Finance and economic concerns may also function as a deterrent to implementing green ideas and practices.

Although some businesses may be encouraged to adopt green practises by financial incentives like cost savings, the high cost of investing in green technologies typically discourages businesses from making such changes, according to (Gupta & Barua, 2018; Li et al., 2020). Given the unpredictability of payback times, the financial barrier to adopting green innovation is reasonable. It has been recognised in previous research (e.g. Ormazabal, Prieto-Sandoval, Puga-Leal, & Jaca, 2018). External stakeholders such as governments, business partners (e.g., Kumar, Brint, Shi, Upadhyay, & Ruan, 2019), and customers, according to Gupta and Barua (2018), are also deterrents for companies from undertaking green investments.

Institutional and governance barriers are those erected by governing entities. The people most impacted by these barriers are managerial stakeholders as well as those working in the political and legislative spheres. Poor governance and a lack of policy formulation about execution are common causes of this type of barrier. Borelli, Conigliaro, Quaglia, and Salbitano (2017); O'Donnell, Lamond, and Thorne (2017) and Yu, Zhang, Cao, and Kazancoglu (2021) all mention institutional and governance-related barriers. Green investment, for example, faces institutional and governance-related barriers that call for a person or group of people who can forge connections, build trust, and transcend institutional boundaries. In circles of environmental governance, when multiple administrators of distinct ecosystem services are divided, this may not be sufficient. Without a clear leadership structure, interagency fragmentation and poor communication

across management units are more likely (Karlsson & Hovelsrud, 2021; O'Donnell et al., 2017).

Embedded cultures within a stakeholder group and difficulties with their perspective of firms are reflected in sociocultural barriers. Stakeholder groups may encounter different barriers. Managerial groups, for example, are likelier to stick with known systems, whereas resident groups may place a low value on environmental activities. The literature frequently mentions sociocultural obstacles. (Cousins, 2017; Dhakal & Chevalier, 2017; Finewood, Matsler, & Zivkovich, 2019; Xu, Cui, & Xiang, 2021) Processes that "are unable to shake free of their past" have been defined as technocratic path dependency (David, 2007; Fu, Xiao, & Wu, 2020). This indicates that business leaders and managers are hesitant to use the innovative strategies and practices needed to increase green investment. Similar to this, landowners could be reluctant to change habits they have developed or take part in environmentally friendly initiatives that are generating programmes (Johns, 2019; Zhai & An, 2020).

Financing challenges were frequently highlighted as a barrier in the research literature (e.g. Di Marino, Tiitu, Lapintie, Viinikka, & Kopperoinen, 2019; Dupras, Drouin, André, & Gonzalez, 2015). There is constantly a lack of finance and understanding regarding green investment's advantages to society. However, some extra concerns with green investing are not as prevalent in traditional finance initiatives. According to Keeley et al. (2013), restrictions such as not being allowed to spend money on private land may impede green finance links, which might drive up costs or make it impossible to complete the project. As a result of other priorities and a dearth of available personnel, some managers may feel overwhelmed and unable to explore green ideas (Feng, Wang, Liu, & Huang, 2017; Wihlborg, Sörensen, & Alkan Olsson, 2019). It has also been suggested that green infrastructure efforts demand more training and recruiting than grey infrastructure activities (Gao, Zhang, Jun, Ki, & Park, 2021; Johns, 2019).

Green finance implementation is hindered by political barriers (Du, Cheng, & Yao, 2021; Kasten, 2011). As developing nations grapple with natural resource depletion, food security, health, and economic difficulties brought on by climate change, domestic strife and instability may grow. Disruptions like this are just not good for the company. While local firms in climate-vulnerable nations will be the most affected, political instability poses a substantial threat to multinational corporations operating in such countries, especially those with significant on-the-ground physical investments or a significant market share (Du et al., 2021; Kasten, 2011).

A market with expert staff for green investment projects is a barrier (Cullen et al., 2020). Hiring employees with experience in green investing and offering them a large wage to engage in schemes. Payments for ecosystem services (PES) is the name given to these initiatives. PES has long been used in agriculture as part of agri-environmental initiatives (Cullen et al., 2020; McGurk, Hynes, & Thorne, 2020). Climate change will make certain products and services less relevant or ineffective. Companies may see significant regional shifts in their client bases when some locations grow hotter, wetter, or drier. Among customers who are more conscious of climate change, demand for products and services that waste limited resources like electricity and water or increase climate hazards may decline. As customers in developing countries are forced to deal with climate change, they

may have less purchasing power (especially for non-essential products and services), affecting the profitability of certain businesses (Kasten, 2011; Li et al., 2020).

The micro and macroeconomic barrier is another hurdle toward the adaptation of green finance. The issue of adaptation is dynamic and changes in response to a changing climate (Wang, 2020). Perhaps the best way to handle adaptation is through a long-term transitional, ongoing, flexible process that includes learning and adjusting (Hickmann, Widerberg, Lederer, & Pattberg, 2021). The literature generally suggests that the best adaptation and the appropriateness of specific techniques would change over time depending on climatic forcing and other factors like technology availability and its maturity (Mets & Holbrook, 2021). Adaptation is the principal economic option for addressing actual climate change in the coming decades, assuming forecast temperatures do not differ significantly across socioeconomic/climate scenarios. In the longer term, the risk is more unpredictable than in the short term.

Figure 1: Identified Barriers

Methodology

The study employs a deductive approach and develops hypotheses based on a theoretical framework derived from prior research. To find the obstacles to going green, a keyword search was conducted in the major research databases such Wiley, Springer, Elsevier, Taylor & Francis, Sage, Emerald Publisher, and Google Scholar. This study employed the quantitative research strategy, which is a popular technique in social science research (Bamgbade, Gbadebo Salimon, Adeleke, & Nasidi, 2019; Barclay, Higgins, & Thompson, 2015). The questionnaire for the study was created to gather data based on the extensive literature review and review by field experts. This study used an online survey questionnaire to collect primary data (Appendix A). An online survey was used to collect the data (Appendix A). This data is then analysed using the following values: Cronbach's Alpha (0.7), Composite Reliability (0.7), AVE (0,5), and factor loading (0.7) (Yunos & Abdul Lasi, 2020)

Data Analysis

The study created a quantitative questionnaire to investigate the obstacles to being green. A quantitative study design was used for the questionnaire's creation and validation. A standardised technique that focused on group discussion, expert review, pre-testing (Phase 1), and validation (Phase 2) included a literature review Table.1 (Bandhu Kalanidhi et al., 2021; Arora, Sinha, & Malhotra, 2017).

Phase 1: Development of the questionnaire

An extensive literature review was executed by bringing into play several systematically identified databases for variable identification. Using the key string green finance, green transformation and barriers towards adaptation. Table 2 illustrates the process used to create the questionnaire.

Table 1: Development of the Questionnaire

Steps involved in questionnaire development

Steps	**Nature of activity**	**Methods**	**No of the items in the steps**	**Addition and subtraction**
1	Development of construct	Literature Review	133	0
2	Focus Group interview	Face to Face interview	133	0 subtracted
3	Item generation	Develop items	133	0
4	Establishment of the face and content validity	Expert validation	70	63 subtracted
5	Testing the Questionnaire	Test the hypothesis	70	0
6	Establishment of Construct validity	Item analysis and factor analysis	70	0

3.1.2 Literature Construct Barriers

These are the literature construct barrier

Table 2: Identified Barriers

Code	Barriers	Studies
B1	**Economic Barrier**	(Darko & Chan, 2017; Kasten, 2011; Licastro & Sergi, 2021; Purwandani & Michaud, 2021)
B2	**Market barrier**	(Darko & Chan, 2017; Darko et al., 2018; Deely et al., 2020; Kasten, 2011; Purwandani & Michaud, 2021)
B3	**Political barrier**	(Berensmann et al., 2017; Chien et al., 2021; Lo & Shiah, 2016)
B4	**Awareness barrier**	(Chien et al., 2021; Darko et al., 2018; Deely et al., 2020; Kasten, 2011; Purwandani & Michaud, 2021)
B5	**Technological barrier**	(Chien et al., 2021; Deely et al., 2020; Li, Pan, Kim, Linn, & Chiang, 2015; Purwandani & Michaud, 2021)
B6	**Management barrier**	(Chien et al., 2021; Darko et al., 2018; Kasten, 2011; Purwandani & Michaud, 2021)
B7	**Institutional and Government barriers**	(Darko et al., 2018; Kasten, 2011; Li et al., 2015; Purwandani & Michaud, 2021)
B8	**Socio culture barrier**	(Darko & Chan, 2017; Licastro & Sergi, 2021)
B9	**Access to finance barrier**	(Darko et al., 2018; Kasten, 2011; Li et al., 2015; Park & Kim, 2020)
B10	**Micro / internal barrier**	(Berensmann et al., 2017; Kasten, 2011; Schleich, 2011)
B11	**Macro / external barrier**	(Berensmann et al., 2017; Kasten, 2011; Schleich, 2011)

Focus Group Discussion

Since it was developed by to conduct qualitative research, focus group approach has been a developed by (Merton, Lowenthal, & Kendall, 1990). Focus group facilitation is a reliable and informative technique that hasn't changed much over the past century, becoming a cornerstone of social scientific research, commercial marketing, and the study of health (Carey & Asbury, 2012). Focus groups enable extensive debate among several participants to record both deeper understanding and diverse viewpoints on a single issue. This contrasts with other qualitative data gathering techniques like semi-structured individual interviews. Focus groups offer the benefit of promoting idea development

among participants, stirring or retorting ideas that may be missed by other techniques (Carey & Asbury, 2012; Sletvold & Nguyen, 2021).

The supervisor reduced ambiguity and ensured strong content validity after reviewing initial variables from the literature. This study used a qualitative approach that included in-depth, face-to-face interviews. The 11 factors were validated by a four-member expert panel who were chosen for their proficiency and depth of knowledge in the field of finance (Bai et al., 2018; Thorn & Deitz, 1989). The judges evaluated clarity of wording, appropriateness for the measured construct, and the possibility of differentiating the target audience as criteria for keeping or removing variables. For each variable, each expert expressed their decision (to eliminate, keep, or alter) and provided comments for the amended variables. Variables consistently judged to be removed were removed, and the suggested items were modified.

Item Generation

There are 133 items prepared against 11 variables based on literature and expert opinions on variables. At both the item and test levels, content validity is evaluated. The extent to which each item in a test measures the content domain is known as item content validity. At the test level, content validity refers to the complete collection of test items' representativeness as a measure of the content domain (Bai et al., 2018). After modifying, eliminating, and keeping the items, 70 items have been created.

Establishment of the face and content validity

A measurement's face validity and content validity are ways to analyse and quantify it in terms of what it purports to measure, respectively, in the eyes of laypeople (face validity) and content specialists (content validity; (Streiner, Norman, & Cairney, 2014)). When compared to related or unrelated measurements employing the same (convergent) or opposing (divergent) conceptions, construct validity is the extent to which a measurement supports its intended outcome (e.g., construct of interest) across time (Streiner et al., 2014). Clarity, understandability, and congruence are increased while user discontent is reduced thanks to face validity (Streiner et al., 2014). Lynn (1986) asserts that content validity is a two-stage procedure. The first stage deals with creating a measurement tool for a certain content area. The ratings of the actual material of interest given by the content specialists are used in the second step to assess and quantify the measurement. To eliminate the possibility of rater agreement being influenced by chance, Lynn recommends using at least five experienced raters. However, Lynn notes that this is not always realistic in some subject fields, and she proposes using as few as three expert reviewers to carry out the assessments.

The 133 items were used for the first version after item reduction and alteration, and it was forwarded to two foreign experts for face and content validity validation. On a 5-point Likert scale, they also assessed each item's level of relevance for the relevant concept (1 = Strongly Disagree, 2 = Disagree, 3 = Natural, 4 = Agree, and 5 = Strongly Agree).

After the item reduction, 70 things were kept, and some were changed to be more readable and explicit based on the experts' recommendations. For the pilot study, these items were employed. There were no further new things, items were deleted, or the face validity and

content validity method were further modified according to the opinions and reactions of experts.

Validation of Questionnaire

Data was gathered from 800 participants who were investors from the Lahore Chamber of Commerce for the validation of the questionnaire. Data was gathered between 1 October 2021 and 2 February 2022 using a Google form-designed questionnaire.

Target Population

The population in this research is the investors from across Pakistan, registered through the Chamber of Commerce, trade, and industries. The population is divided into four clusters based on the provincial divide (i.e. Punjab for provincial divide, see appendix). Further, break down the cluster into districts basis (e.g. Lahore District, Bahawalpur District, etc. for a detailed list of districts, see appendix). So cluster-sampling technique was used to spread the questionnaire.

Statistical Analysis

The newly developed questionnaire's face and content validity were determined through focus group discussion and expert review. An exploratory component analysis CFA was used to test the construct validity Field to investigate the domain structure. The Kaiser Mayer Olkin (KMO) metric was used to assess sample adequacy, while Cronbach's Alpha was utilised to assess internal consistency. The number of factors in the factor was established using the SmartPLS (Partial Least Square) software version 3.0 and an eigenvalue threshold of 1 (Bavel et al., 2020)

Table 4: Demographic of the respondents

Characteristics	N	%
Age	492	
• Up to 30	263	56.93
• 31 to 40	169	36.58
• Above 40	30	6.49
Gender		
• Male	381	77.44
• Female	38	7.72
• Prefer not to say	73	14.84
Experience		
• Less than 5 years	254	51.63
• Less than 10 years	199	40.45
• More than 10 year	39	7.93

Marital Status		
• Married	372	75.61
• Unmarried	120	24.39
Investor		
• Individual	161	32.72
• Small and Medium Enterprise	166	33.74
• Corporate	112	22.76
• Social Entrepreneur	53	10.77
Investor Type		
• Registered	427	92.42
• Unregistered	35	7.58

Reliability and Validity

According to Hair, Risher, Sarstedt, and Ringle (2019), the measurement model is evaluated in this study using four criteria: discriminant validity, convergent validity, model fit evaluation, and reliability indicator of the variables/items observed (Henseler, Ringle, & Sinkovics, 2009: 2014). The values of the reliability and validity constructs were compared to the genuine values of the population model, which is more efficient and useful in establishing which estimating procedures are trustworthy when analysing measurement models, which is one of the goals of this research.

Many studies consider that reliability and validity are important qualities in SEM context analysis in order to ensure that the route coefficients acquired may be universally accepted for managerial decisions or for the progression of dynamics (Afthanorhan, Awang, & Aimran, 2020; Basheer et al., 2021). The value of outer loading and CR define the construct's reliability. Meanwhile, the AVE value determines the convergent validity. The value of outer loading is used to determine the indicator's dependability. The indicators are conditionally approved for the constructions that hold the indicators through the CR and AVE values (Hazirah, Dzin, & Lay, 2021(Raoof et al., 2021; Basheer et al., 2021; Nuseir et al., 2020)

Cronbach's Alpha and composite reliability, according to Hair et al. (2019), must be more than 0.7 and 0.95, respectively, for internal consistency dependability. The study's Cronbach's Alpha and composite reliability ratings were all more than 0.7, indicating that all variables showed good internal consistency dependability.

Table 5: Construct Reliability and Validity				
	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**Average Variance Extracted (AVE)**
EFB	0.849	0.857	0.881	0.512
GT	0.866	0.868	0.895	0.517
IGB	0.865	0.877	0.898	0.596
MACB	0.774	0.776	0.842	0.524
MB	0.925	0.927	0.935	0.507
MGTB	0.764	0.772	0.848	0.583
SCB	0.811	0.814	0.869	0.571
TB	0.743	0.751	0.823	0.552

The findings for internal consistency reliability are shown in Table 4. Factor loadings, Cronbach's Alpha, CR, and AVE were used to determine the convergent validity (Hair, Black, Babin, & Anderson, 2014). Convergent validity is the degree to which one variable's item expresses the same concept as another (Fornell, 1994). When the AVE value is 0.5 or greater, convergence validity is acceptable (Chin, 1998b; Hair, Ringle, & Sarstedt, 2011; Hair, Hult, Ringle, & Sarstedt, 2015). Table 4 shows that the aggregate item loadings are more than 0.5 (Chin, 1998a). Values of CR were higher than the threshold of 0.7 (Hair et al., 2006). The importance of the AVE value stems from the fact that it reflects the extent of the variation among the observables that the latent concept purports to explain.

This scale's discriminant validity is determined using the Heterotrait-Monotrate Ratio (HTMT) standard. Cross-loading values and the Fornell-Larcker criteria were used in earlier studies to discover the discriminant validity of the scale, but it now appears that these two criteria are insufficient to identify most items with low discriminant validity. Therefore, experts have suggested using the HTMT criteria as the primary gauge of a structured model's discriminant validity (Henseler, Ringle, & Sarstedt, 2015). When the HTMT value of an idea does not surpass 0.90, discriminant validity is established in a reflective measuring strategy (Gold, Malhotra, & Segars, 2001). The true HTMT confidence interval was then calculated using a bootstrapping approach. In this method, a 95 per cent confidence interval was used. To establish the discriminant validity of the concept, the confidence interval for the HTMT test should not have a value of "1."

A measure's discriminant validity relates to how well it isn't influenced by other factors (Ramayah, Yeap, & Ignatius, 2013). Discriminant validity refers to a variable's ability to distinguish itself from other variables (Duarte & Raposo, 2010). Both the Fornell and Larcker (1981) and the HTMT criteria were used to evaluate the discriminant validity of each variable in the study. Fornell and Larcker state that no two variables should share a variance larger than their AVEs. HTMT should be below 0.85 or 0.9. Both criteria were employed in this study to evaluate discriminant validity.

Table 6: Discriminant Validity by Fornell and Larcker criteria

	EFB	GT	IGB	MACB	MB	MGTB	SCB	TB
EFB	0.694							
GT	0.581	0.719						
IGB	0.721	0.509	0.772					
MACB	0.578	0.722	0.612	0.686				
MB	0.873	0.615	0.915	0.664	0.712			
MGTB	0.804	0.465	0.622	0.421	0.701	0.763		
SCB	0.803	0.583	0.816	0.639	0.948	0.686	0.755	
TB	0.615	0.720	0.608	0.920	0.677	0.434	0.655	0.662

Table 7: Discriminant **Validity by Heterotrait-Monotrate**

	EFB	GT	IGB	MACB	MB	MGTB	SCB	TB
EFB								
GT	**0.641**							
IGB	**0.839**	**0.574**						
MACB	**0.687**	0.875	**0.750**					
MB	0.829	**0.675**	0.826	**0.786**				
MGTB	0.835	**0.554**	**0.754**	**0.538**	**0.824**			
SCB	0.832	**0.691**	**0.831**	**0.809**	0.803	0.862		
TB	**0.747**	0.887	**0.770**	0.821	**0.828**	**0.572**	0.856	

Tables 5 and 6 show that the discriminant validity of the constructs is supported by the fact that the square root of the AVE (diagonal values) for each of the constructs is larger than the correlation coefficient for that construct (Fornell & Larcker, 1981). Table 7 also demonstrates that indicator build loadings are always higher than cross-loadings with other

constructions. The results show discriminant validity between all constructs, as judged by the cross-loadings criterion.

Table 8: Cross loading

		EFB	GT	IGB	MACB	MB	MGTB	SCB	TB
1	**AB1**	0.784	0.450	0.621	0.475	0.745	0.563	0.653	0.503
2	**AB2**	0.699	0.352	0.579	0.417	0.680	0.455	0.615	0.422
3	**AB3**	0.678	0.521	0.505	0.470	0.667	0.417	0.580	0.519
4	**EB3**	0.658	0.301	0.447	0.298	0.519	0.727	0.527	0.290
5	**EB4**	0.669	0.333	0.566	0.275	0.580	0.763	0.521	0.282
6	**EB5**	0.717	0.301	0.553	0.400	0.634	0.577	0.617	0.397
7	**EB6**	0.668	0.321	0.407	0.309	0.503	0.809	0.501	0.318
8	**FB1**	0.784	0.450	0.621	0.475	0.745	0.563	0.653	0.503
9	**FB2**	0.699	0.352	0.579	0.417	0.680	0.455	0.615	0.422
10	**FB3**	0.678	0.521	0.505	0.470	0.667	0.417	0.580	0.519
11	**FB5**	0.672	0.500	0.354	0.462	0.487	0.365	0.455	0.536
12	**GT10**	0.461	0.754	0.404	0.572	0.485	0.401	0.460	0.578
13	**GT2**	0.344	0.653	0.301	0.434	0.376	0.257	0.347	0.436
14	**GT3**	0.429	0.683	0.303	0.452	0.410	0.328	0.374	0.489
15	**GT4**	0.381	0.729	0.382	0.546	0.444	0.306	0.440	0.517
16	**GT5**	0.436	0.751	0.399	0.544	0.470	0.390	0.478	0.536
17	**GT7**	0.396	0.701	0.313	0.512	0.385	0.288	0.354	0.495
18	**GT8**	0.426	0.760	0.417	0.544	0.473	0.363	0.459	0.533
19	**GT9**	0.454	0.712	0.392	0.533	0.479	0.326	0.425	0.539
20	**I&GB 7**	0.581	0.433	0.842	0.525	0.774	0.493	0.680	0.505
21	**I&GB1**	0.510	0.288	0.707	0.414	0.587	0.443	0.545	0.390
22	**I&GB2**	0.459	0.340	0.777	0.495	0.672	0.354	0.605	0.472
23	**I&GB3**	0.647	0.400	0.740	0.451	0.738	0.587	0.649	0.455
24	**I&GB5**	0.593	0.479	0.818	0.477	0.741	0.526	0.647	0.489
25	**I&GB6**	0.532	0.373	0.740	0.473	0.700	0.454	0.640	0.494
26	**MACB1**	0.325	0.550	0.345	0.685	0.384	0.247	0.389	0.707
27	**MACB2**	0.397	0.502	0.449	0.702	0.463	0.286	0.418	0.697
28	**MACB3**	0.336	0.453	0.347	0.683	0.396	0.239	0.406	0.654
29	**MACB4**	0.388	0.446	0.453	0.638	0.480	0.319	0.466	0.431
30	**MACB5**	0.409	0.487	0.537	0.733	0.527	0.324	0.486	0.556
31	**MB2**	0.459	0.340	0.777	0.495	0.672	0.354	0.605	0.472
32	**MB3**	0.647	0.400	0.740	0.451	0.738	0.587	0.649	0.455
33	**MB4**	0.645	0.500	0.490	0.420	0.666	0.511	0.596	0.405
34	**MB5**	0.593	0.479	0.818	0.477	0.741	0.526	0.647	0.489
35	**MB6**	0.532	0.373	0.740	0.473	0.700	0.454	0.640	0.494
36	**MGTB1**	0.498	0.434	0.472	0.382	0.532	0.752	0.538	0.407
37	**MGTB3**	0.658	0.301	0.447	0.298	0.519	0.727	0.527	0.290

38	**MGTB4**	0.669	0.333	0.566	0.275	0.580	0.763	0.521	0.282
39	**MGTB6**	0.668	0.321	0.407	0.309	0.503	0.809	0.501	0.318
40	**MICB3**	0.521	0.519	0.397	0.669	0.486	0.321	0.470	0.705
41	**PB1**	0.581	0.433	0.842	0.525	0.774	0.493	0.680	0.505
42	**PB2**	0.542	0.422	0.621	0.570	0.707	0.431	0.741	0.523
43	**PB3**	0.625	0.451	0.618	0.420	0.708	0.585	0.728	0.444
44	**PB4**	0.711	0.482	0.597	0.526	0.759	0.583	0.810	0.558
45	**PB5**	0.538	0.426	0.598	0.440	0.675	0.412	0.723	0.496
46	**PB6**	0.604	0.416	0.651	0.458	0.728	0.568	0.771	0.450
47	**SCB1**	0.542	0.422	0.621	0.570	0.707	0.431	0.741	0.523
48	**SCB2**	0.625	0.451	0.618	0.420	0.708	0.585	0.728	0.444
49	**SCB3**	0.711	0.482	0.597	0.526	0.759	0.583	0.810	0.558
50	**SCB4**	0.538	0.426	0.598	0.440	0.675	0.412	0.723	0.496
51	**SCB5**	0.604	0.416	0.651	0.458	0.728	0.568	0.771	0.450
52	**TB1**	0.413	0.428	0.356	0.432	0.432	0.259	0.408	0.601
53	**TB2**	0.521	0.519	0.397	0.669	0.486	0.321	0.470	0.705
54	**TB3**	0.325	0.550	0.345	0.685	0.384	0.247	0.389	0.707
55	**TB4**	0.397	0.502	0.449	0.702	0.463	0.286	0.418	0.697
56	**TB5**	0.336	0.453	0.347	0.683	0.396	0.239	0.406	0.654
57	**TB6**	0.477	0.382	0.567	0.430	0.570	0.401	0.550	0.598

Discussion and Conclusion

Green transformation has increased recently, and barriers to its widespread adoption still exist. Several qualitative studies (Licastro & Sergi, 2021) in the USA, (Chien et al., 2021) in China, (Lo & Shiah, 2016) in Taiwan, (Deely et al., 2020) in Ireland, (Makki et al., 2020) in Saudia Arab, (Wimala et al., 2016) in Indonesia, (Agyekum et al., 2019) in Gana, have investigated the several barriers hindering towards green transformation. The studies due to qualitative indicate a strong need to identify country-specific barriers and their measurement mechanism. This will help align country-specific goals with SDGs, and a scorecard or survey mechanism will help us indicate whether sustainable measures and their positive impact have spread evenly to all sectors of society. The study is also set forth to bridge the knowledge gap about how the major barriers hinder green transformation in developing countries.

This study has identified influential barriers to the implementation of green transformation. Moreover, we have developed and validated scales suitable to measure the identified barriers. Furthermore, the study will significantly help practitioners of green transformation. (CICED, 2020). Finding out the barriers are the most difficult task in this study. In this research, variables are identified based on literature and previous study. Previous studies discuss the barrier in their studies. After five years, the barriers are changed due to the unfortunate situation of the developing and emerging economies.

An exploratory component analysis CFA was used to test construct validity (Kim et al., 2016) to investigate the domain structure. Confirmatory Factor Analysis (CFA) and SEM creates composite reliability and convergent reliability to examine the route linkages between Economic Barrier (EB), Awareness Barrier (AB), Political Barrier (PB), Micro Internal Barrier (MICB), Financial Barrier (EB), Technical Barrier (TB), Management Barrier (MGTB), Institutional and Government Barrier (I&GB), Macro External Barrier (MACB) Market Barrier (MB), Social Cultural Barrier (SCB) and Green Transformation(GT) as an independent variable. This study used SEMs based on the partial least squares (PLS) method. PLS is a well-known method for determining the path coefficients of structural models (Ali, Hussain, & Ragavan, 2014).

Contribution of the study

Below their headings are descriptions of this research's theoretical and practical contributions:

Theoretical contribution

Highlighting the most significant barriers to the adoption of green transformation and investment. The study attempted to examine these barriers by constructing a questionnaire to analyse the barrier to green transformation; on the other side, the researcher constructed a model and evaluated a previously untested theory. This tool is helpful for the Pakistan investor to understand their barrier to green transformation. The current article helps to facilitate the creation of ecologically sound initiatives and, as a result, helps us address the pressing problems of pollution and global warming. If a long-term situation is considered, investing in green investments pays off, per the papers we have read. The repayment period may be greater. However, both private and governmental institutions benefit greatly from the impacts. The specialist literature is provided by the theoretical ramifications of the current study provides key findings of factors that have a vital effect on the improvement of green investing. Consequently, the study adds to the development of the idea of green transformation and the factors that influence it.

Practical Contribution

This study identified barriers that are hurdles toward green transformation implementation. The research and analysis of these variables are expected to understand the impact of barriers toward green transformation. The discussion focused mainly on this study's research objectives and hypotheses.

In an effort to better understand these barriers, researchers have turned to qualitative methods. However, there is a lack of standardised methods for evaluating such barriers worldwide. This Study identified the barriers and developed the tool to assess them, their reliability and validity applied to developing countries, especially in the context of Pakistan. This study also finds out the impact on green transformation. The green transformation has become a significant topic in climate change and sustainability studies. The term "green transformation" has become a prominent policy aim on the country's agenda (Amundsen & Hermansen, 2021; Hölscher et al., 2018). The notion of the green shift was coined (Ytterstad & Bødker, 2022) in the Norwegian discussion over green transformation to address social solutions to climate change. Due to the long payback time associated with green investments, businesses are attracted to select brown investments

without targeted regulations and incentives. As a result, the trend of choosing to invest in green requires significant government assistance. Guaranteed credits, a reduction in taxes paid, subsidies granted to purchase green technology, and free seminars about the value of green investments for private organisations are all examples of policy tools that public authorities may use to encourage green investments.

Limitation

Although various filters were used,

- one weakness of the current study is the exclusion of several papers that might provide additional key hurdles to boosting green transformation.
- The study excluded publications that the database identified as covering the topic of green transformation but could not be accessed in their entirety.
- Furthermore, the study excludes scholarly articles related to the examined issue but not published in English.

Recommendations

The work broadens the research field in this area, as future studies may find the most appropriate methods to identify the barriers to enhancing green transformation and, therefore, reduce the harmful consequences of pollution and climate change. Furthermore, future research on this topic might concentrate on more precisely characterising the detected barrier and calculating the amount of influence of these barriers on other aspects of green. Furthermore, new barriers to green transformation may be uncovered in future study publications and inventive solutions to overcome them. As a result, green transformation will benefit the pressing issues of pollution and global warming.

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