*sustainability*

MDPI

*Article*

# Investigating the Moderating Role of Political Factors on Internal Success Factors and Project Success: Empirical Evidence from Pakistan

**Muhammad Haris and Qing Yang ***

School of Economics and Management, University of Science and Technology Beijing, Beijing 100083, China
* Correspondence: yangqing@manage.ustb.edu.cn

**Abstract:** The global collective actions of countries are insufficient to meet the goals agreed upon under the Paris Agreement. On one hand, countries are trailing behind in meeting their renewable energy targets. On the other hand, the implementation of renewable energy projects is affected by the political, regulatory, and policy challenges faced by engineering, procurement, and construction firms. Such issues force project firms to overlook their best practices and cause delays in connecting renewable energy plants to the national grid. This study investigates the relationship between two key project-level critical success factors and the project success of renewable energy projects in Pakistan with the moderating role of political factors. Using a data set of 238 respondents and Smart PLS 4 to analyze the data set, the results confirm the positive impact of communication and organizational factors on a project's success. The findings also indicate that political factors are a major bottleneck that weakens the capability of project organizations to implement renewable energy projects in Pakistan. The current line of inquiry has implications for the ability of governments to effectively manage the power generation sector and support the transition to renewable energy. It also has significant theoretical implications for environmental contingency theory in terms of the adaptation of project firms to the external environment. The study concludes that project firms in the renewable energy sector need to be aware of political forces in the external environment to not only minimize their impact but to also provide timely completion of projects within and beyond Pakistan.

**Keywords:** critical success factors; renewable energy projects; external environmental factors; political factors; energy transition



**Citation:** Haris, M.; Yang, Q. Investigating the Moderating Role of Political Factors on Internal Success Factors and Project Success: Empirical Evidence from Pakistan. *Sustainability* **2023**, *15*, 8910. https://doi.org/10.3390/su15118910

Academic Editor: Kentaka Aruga

Received: 19 March 2023
Revised: 26 May 2023
Accepted: 26 May 2023
Published: 31 May 2023



## 1. Introduction

The Paris Agreement calls on countries to limit global warming to well below 2 degrees Celsius, and preferably to 1.5 degrees Celsius. According to the UNEP's 2022 emissions gap report, the current actions by countries are off track to meet emission targets, which will push to a 2.6-degree Celsius increase by the end of this century [1]. Renewable energy projects are at the core of clean energy transitions and hope to account for more than one-third of $CO_2$ emissions reductions from 2020 to 2030 under the net-zero-emissions case by 2050. Although renewables are expected to comprise a 90% share of global electricity expansion for the period from 2022 to 2027, their implementation is affected by policy, regulatory, political, and financial challenges [2]. Addressing such implementation issues will likely reduce the gaps in the growth of renewable power generation globally.

Pakistan is a growing and developing Asian country that has a 61% share of thermal power generation in its energy mix. Although the geography of Pakistan offers it the ability to leverage abundant solar and wind power to meet domestic demand [3], the current share of renewables stands at a meager 6.5% [4]. The history of Pakistan's power sector is replete with power shortages due to a mismatch in the demand and supply, often resulting in hours-long country-wide load shedding. Conversely, the energy mix remains titled towards imported fossil fuels on account of uncoordinated policymaking and lack of long-term

energy planning [5]. The excessive dependence on power generation from imported fossil fuels has repercussions in the form of an increase in the carbon footprint of the power sector, uncertain energy security, higher cost of power generation, and a rising import bill.

Pakistan's quest for renewable energy projects gained momentum in 2015 when investments worth USD 33.8 billion were earmarked for energy projects under the China–Pakistan Economic Corridor project [6]. In 2015, the share of renewables was 1.8%, whereas completion of four projects under the China–Pakistan Economic Corridor added 600 MW of capacity by the end of 2017 [6]. Currently, there are a total of 39 wind-powered projects (1838 MW), 9 solar (609 MW)-, and 9 biomass (278 MW)-based projects already connected to the national grid. The most recent Indicative Generation Capacity Expansion Plan (IGCEP 2022-30) targets are intended to enhance the share of renewables to 30 percent by 2030 [7]. However, a major hurdle in the completion of projects is political instability, which instigates inconsistency in the support from the government. The most recent manifestation of political instability was the ouster of Prime Minister Imran Khan from the parliament in April 2022. Before leaving office, his government granted excessive subsidies which staved Pakistan off from the ongoing IMF bailout package. As a result, Pakistan's foreign exchange reserves steadily declined and currently stand at USD 3.7 billion [8]. Due to political instability, a host of other political factors, such as inconsistencies in policies and the legal system, issues with the provision of land, and lack of sovereign guarantees and finances, has caused bottlenecks for project developers. For example, the Zhenfa Pakistan solar energy project was completed after a delay of seven months, whereas ongoing solar projects, such as Meridian, HND, and Helios energy, are still under construction, although they were expected to be completed by the end of 2022 [9].

With the growing importance of renewable energy projects, there is a growing body of literature that not only highlights the barriers to the development of renewable energy projects but also highlights critical success factors (CSFs). Numerous studies have highlighted the external environmental barriers affecting the development of renewable energy in the context of different countries. These include studies conducted on the cases of Nepal [10], China [11], Indonesia [12,13], Mozambique [14], Malawi [15], Nigeria [16], Sri Lanka [17], Greece [18], Chile [19] and the Dominican Republic [20]. In the context of Pakistan, Maqbool and Sudong (2018) categorized the CSFs and investigated their impact on project success [21]. However, subsequent studies only added limited value to the literature by assessing the role of project efficiency [22], organizational support [23], despotic leadership [24], and stakeholder satisfaction [25,26] as mediating variables between the success factors and project success. While the focus of this growing literature remains restricted to the CSFs, there is a huge gap in the literature regarding how external environmental factors affect the relationship between project-level CSFs and project success. As such, the literature does not answer the role of political factors specifically on the implementation of renewable energy projects in Pakistan.

To fill the above-mentioned gaps, this study aims to find the impact of organizational and communication factors on a project's success. It also investigates how political factors moderate the relationship of selected project-level factors with the project's success. This study makes its unique contribution to the literature by exploring the role of political factors within the politically charged external environment in Pakistan. This not only provides a basis to explore the role of political factors as the moderating variable, but it also fills a gap in the literature by assessing the impact on communication channels and processes, which are indispensable to the smooth operation of renewable energy projects. This study provides key insights for project managers, stakeholders, and top management of project firms operating within and outside Pakistan and draws their attention to be wary of political factors which can cause hurdles in the implementation of projects. In addition, this study provides valuable insights to the Government of Pakistan in terms of revisiting its policies and regulatory regime to enhance the chances of project success as well as to expedite the transition to renewable energy. As such, this study makes its theoretical contribution to environmental contingency theory by corroborating that project

firms need to adapt their processes, communication channels, and managerial practices in response to changes in the external environment. Section 2 presents the literature review. The hypothesis of the study is established in Section 3. The next section describes the research methods. In Section 5, the results are described. Section 6 presents a discussion of the results followed by the conclusion.

## 2. Literature Review

This section highlights the theoretical support for the study, literature on the CSFs, project success, and the role of political factors in projects as external environmental factors.

### *2.1. Theoretical Foundation*

The theoretical support for this study stems from both modern organizational theory and environmental contingency theory. The former is based on the premise that the only way to comprehend organizations is to treat them as a system [27]. An organization is a function of mutually dependent variables which collectively impact organizational rationality based on its established objectives [28]. The pursuit of organizations to attain the goals of growth and stability resides with two key pillars of the system: the structure and the processes which define organizations [27]. Both the formal and the informal dimensions of organizational structure are inseparable as their interaction results in the establishment of the norms of an organization [28]. Modern organizational theory also emphasizes the importance of harvesting, processing, and delivering information, which links the sections of the system together [29]. Thus, communication within organizations is not only viewed as the stimulus which serves as the control and coordination mechanism, but it also integrates the system's decision centers into synchronized patterns [30].

Although modern organizational theory examines organizations by considering them as integrated wholes, it does not offer any explanation of the cause and effect emerging from the external environment. Secondly, the applicability of this theory is restricted to modern-day dynamic organizations which seek to adapt to external changes. Considering these limitations of modern organizational theory, environmental contingency theory was incorporated into this study. This theory posits that there is no optimal approach to effectively managing, planning, organizing, and leading an organization [30,31]. Rather internal and environmental contingencies and their ensuing uncertainty force organizations to tailor their processes according to particular circumstances [29,30]. In view of Burns and Stalker, organizations are more likely to make use of their resources, reduce costs, and maximize their profits in a stable environment [32]. However, organizations must bear the cost in terms of a decline in productivity and profit when it is inevitable for them to adapt to changes in the external environment. The uncertainty affects the implementation of rules, policies, and procedures, which provide the basis for organizations to make decisions for both routine and non-routine tasks [30]. Therefore, environmental contingency theory explains the interaction of an organization with the external environment and why this relationship determines the success of organizations.

### *2.2. Categorization of Critical Success Factors*

The concept of CSFs received little attention of academics initially. It was introduced by [33] in the 1960s [33]. Earlier literature on CSFs evolved with time, and its focus was mainly concentrated on defining the concept of these factors and exploring their link with a project's success [33–36]. In view of [35], CSFs are the key areas that drive the success of organizations [35]. One of the earliest empirical studies, by [37], demonstrated that ten CSFs are strongly linked to project success [34,37]. These factors were mainly composed of factors internal to the organizations and were found to be generalizable to a wide variety of projects. Another study, by [38] found 15 factors within organizations, such as the role of human resources, planning, client involvement, a skilled team, technical expertise, and project communication [38]. They also identified the external environmental factors that demonstrated external influence outside the control of the project teams [35,38,39]. In

view of [35], CSFs are categorized into macro/environment, industry-level, and firm-level factors [35].

A growing body of literature covers the identification of CSFs specifically in the context of energy projects. In two different studies, ref. [39] investigated the CSFs of power projects in China [39] and compared factors impacting wind and thermal power plants [40]. According to [39], 14 factors contribute to the success of power projects spread across the micro (project level) and the macro level [39]. Project-level factors include the project's financial attractiveness, the business and management capacity of the project developer, and success achieved in completing past projects. At the macro level, active factors impacting the project are related to political, economic, legal and regulatory, environmental, and social categories. According to [41], five factors contribute to the success of projects, such as monitoring, coordination (national), design, training, and institutional environment [41]. In another study, by [42], government policies are attributed as a significant factor impacting the implementation of renewable energy projects in Malaysia [42]. In the context of success factors and barriers of public–private partnerships for renewable energy projects across the globe, ref. [43] highlighted the role of skills and efficiency with respect to both parties, proper documentation, technical development, and proper risk allocation in project implementation [43]. In addition, barriers emanating from different categories, such as political, regulatory, financial, technical, technological, construction, operational, and force majeure, have wide and varied impacts on projects across different countries [10–16,18].

Pioneering work on categorizing and finding the impact of CSFs on project success was carried out by [21]. They found that the following factors directly contribute to a project's success.

- Communication factors;
- Team factors;
- Technical factors;
- Organizational factors;
- Environmental factors.

Based on the framework of this study, numerous other studies added scholarship to the literature by mediating the effect of numerous variables in the context of Pakistan. All these studies reported the direct relation of CSFs to project success [22–25]. After a careful review of the literature, this study deploys the framework of CSFs on a project's success. The framework of this study treats communication, team, technical, and organizational factors as project-level factors, whereas environmental factors are referred to as external environmental factors [39]. In addition, this research deploys only two project-level factors, communication and organizational factors, because these factors significantly and positively affect construction-based renewable energy projects' success. The definitions of deployed success factors are mentioned in Table 1.

**Table 1.** Success factors affecting project success.

| Critical Success Factors | References |
| --- | --- |
| **Communication Factors** | |
| A key area of project management. Whole project aspects are reliant on the effectiveness of communication. Its effectiveness and brevity provide an environment that delivers project success. | [29,32,33] |
| **Organizational Factors** | |
| This refers to the best processes, methods, and techniques devised to achieve project success. | [35,38,39] |
| **External Environmental Factors** | |
| Environmental factors refer to the factors that are not under the control of the project team. Domains include political, economic, social, technological, and natural disasters. | [16,23,25,40,42] |

### 2.3. Political Factors

The private sector's capability to invest in and implement energy projects is restricted by its inability to meet high upfront costs and hostility due to operations in different areas of the world [44]. It looks upon host governments to provide a level playing field. However, the external environment, in its various manifestations, such as economic, social, political, physical, technological climate, and industry-specific factors, affects the outcome of projects [10,14]. External environmental factors consist of non-specific elements which influence an organization's strategies, stakeholders, and inter-organizational networks [29].

Political factors are external factors associated with the nature of the political system within which the projects are implemented [29]. Numerous studies have highlighted political factors which impact the success of renewable energy projects. Although political and legal factors are so interlaced in the literature, to the extent that it is difficult to analyze them separately [19], Table 2 highlights the political factors extracted from specific country cases. Investors and project developers require a stable and conducive environment and seek guarantees from governments to safely operate. However, there is evidence that countries which are characterized by unpredictable events and political instability deter both national and international investors from investing in energy projects [10,12,14]. A study by [10], which investigated the barriers to renewable energy projects in Nepal, found that the frequent changes in government and ensuing instability restricted the commitment of political leaders towards renewable energy development [10]. The enabling environment for renewable energy is based on clear policies and a supportive regulatory framework. Developing countries lag in their support of energy projects, as they have neither a comprehensive energy policy nor policies that are developed meticulously. In addition, evidence supports the worsening impact of instability on political leadership and its capability to formulate policy, as demonstrated by the case of Indonesia [12]. Another major hurdle faced by project developers is the frequent changes in the regulatory regime of the host country. These issues range from changes in upfront subsidies and tax exemptions to changes in interest loans, approval processes, and land acquisition. Similarly, political barriers are also known to impact the success of renewable energy projects in Sri Lanka [17]. According to [17], equipment for renewable projects is imported, and project developers are reported to incur higher tax costs to import equipment due to an unsupportive regulatory regime. In addition, the implementation of energy projects is affected by delays on account of long and lengthy approval processes in Sri Lanka [17].

**Table 2.** Political factors affecting renewable energy projects in developing countries.

| Country | Source | Political Environment | RE Policy | Fiscal Subsidies/Incentives | Taxation | Transparency in Decision-Making | Corruption | Approval Process | Land Acquisition |
|---|---|---|---|---|---|---|---|---|---|
| China | [11] | | ✓ | ✓ | | | | | |
| Indonesia | [13] | | | | ✓ | ✓ | | | |
| Indonesia | [12] | ✓ | | | | | | ✓ | |
| Nigeria | [16] | | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| Sri Lanka | [17] | | ✓ | ✓ | ✓ | | | ✓ | |
| Malawi | [15] | | ✓ | | | | | | |
| Chile | [19] | ✓ | | ✓ | | | | ✓ | ✓ |
| Nepal | [10] | ✓ | ✓ | | | ✓ | ✓ | | |
| Mozambique | [14] | ✓ | ✓ | ✓ | | | | | |
| Greece | [18] | | ✓ | ✓ | | | | ✓ | |
| Dominican Republic | [20] | | | ✓ | ✓ | ✓ | | ✓ | |

Note: The categories of political factors mentioned above only represent the existence of these barriers in respective countries.

### 2.4. Project Success

Projects are initiated to pursue specific objectives. It is imperative to set the criteria for project success at the outset to avoid misperceptions which could label the project a failure. Project objectives serve as the best criteria to assess the success of projects and provide a benchmark to determine how well the goals are met [45]. The iron triangle is attributed to measuring project success based on the three dimensions of time, cost, and quality [46].

Through time, success can be measured in terms of meeting schedules [47]. In terms of cost, success can be assessed as schedule overruns or underruns of the initial budget [47]. The quality aspect of success can be determined by conformity to the originally agreed upon functional as well as technical specifications of the project. However, complexities surface when project success is viewed beyond the common objectives of cost, time, and quality [45]. The performance of the project is also determined by project characteristics, the satisfaction of stakeholders, and the communication process of the projects. Moreover, project success also depends on anticipating project requirements and arranging resources to accomplish the right task at the right time [48]. Most projects fail as a result of issues not being resolved in a timely manner while gaps persist in the effective coordination and relation between project stakeholders.

## 3. Hypothesis Development

### *3.1. Communication Factors*

The goal of the project is to create a conducive environment that supports a durable and reliable relationship among top management, project teams, and involved stakeholders. Projects face delays during the implementation phase, which are attributed to mistakes by all parties with respect to timely communication of the needs and desires of involved project stakeholders [49]. Project communication is essential as it lasts throughout the project life cycle. Overlooking effective communication in projects has a long-lasting impact on projects, pushing timelines, finances, and scope of projects beyond their permissible targets [50]. Thus, project communication is a key factor defining the success of a project and is repeatedly referred to as the "project life blood" in the literature [21,35,51].

Top management and project managers interact with each other and are also responsible for communication with project stakeholders. Projects can have successful communication only if the strategic organizational vision, mission, objectives, and goals are shared among the stakeholders, top management, and project teams [52]. Many times, there is a unidirectional flow of information from the top management and project teams, which adds complexities to the project implementation. Another dilemma for project communication is the variation in the level of communication due to the engagement of different stakeholders in the form of customer involvement, vendor partnership, and client acceptance [51].

**Hypothesis 1 (H1).** *Communication factors positively affect the project's success.*

### *3.2. Organizational Factors*

Organizational factors are the soft elements that are crucial for the effective management of a project. They are referred to as the best processes, methods, and techniques devised to achieve project success [53]. Organizations expect projects to be completed within the stipulated time and budget, as well as utilize minimal resources. To achieve greater goals of an organization, it is imperative to devise processes, methods, and protocols which could support project implementation effectively and efficiently. In doing so, a viable methodology encompasses a supporting role of top management support [38,54,55], ensuring cash flow for the project [56], realistic and viable work schedules for the workforce [53], and constant monitoring of the market to judge ongoing trends [56]. Energy projects are different from other projects as they are characterized by long construction periods and engagement of the on-site workforce and require a constant flow of finances to ensure continuity in implementation. The role of top management demands its engagement beyond the conventional role of planning and clarifying project objectives to enhance project developers' management and business capacity while keeping an eye on market trends [39].

**Hypothesis 2 (H2).** *Organizational factors positively affect the project's success.*

### *3.3. External Environmental Factors and Project Success*

Numerous studies have examined external environmental factors and empirically support their direct impact on the success of renewable energy projects [21,23,44,57,58]. The unpredictability associated with the external environment brings new challenges for top management, project teams, and stakeholders and adds complexities to the project implementation [59]. The external environment comprises nonspecific elements surrounding an organization and tends to influence an organization's strategies. They are categorized as economic, social, political, physical, technological climate, and industry-specific factors [60]. According to contingency theory, the uncertainty and the unpredictability of the external environment affect decision-making with respect to routine assignments by prohibiting the usage of policies, rules, and procedures [30]. Since the successful implementation of a project requires constant scanning of the environment to reduce undesirable detrimental effects on the project's success [35], contingency theory hypothesizes the moderating impact of external environmental factors on the relationship between project-level factors and project success. However, the role of external environmental factors as a moderating variable is established in earlier studies [61,62].

The successful completion and execution of a project are significantly impacted by the political environment. These elements mainly consist of political stability, government support for energy projects through guarantees to developers, a favorable legal framework, provision of land, tariffs, and employment rules [43]. However, the legal framework of a country and the scale of political support reside in the capabilities of a government. Political support determines the consistency of legal and regulatory frameworks and government interference in effective project delivery. Project contractors are particularly sensitive to any political changes [63]. Any abrupt change in the policies of a government may affect the cash flow elements and may turn a contractor's typical leverage into severe losses [64]. Therefore, it can be deduced from the literature that political factors potentially moderate the relationship between both communication and organizational factors in a project's success.

**Hypothesis 3 (H3).** *The relationship between communication factors and project success weakens when political factors increase.*

**Hypothesis 4 (H4).** *The relationship between organizational factors and project success weakens when political factors increase.*

The relevant literature highlights the impact of organizational, communication, and external factors on a project's success. However, there is no evidence of investigation of the moderating impact of political factors on the relationship of project-specific success factors with project success. The hypotheses supported by theory are mentioned in Table 3.

**Table 3.** Formulated hypotheses and theoretical support.

| Hypotheses | Theoretical Support | References |
| --- | --- | --- |
| **H1:** Communication factors positively affect a project's success. | Modern Organizational Theory | [27,29,30] |
| **H2:** Organizational factors positively affect a project's success. | Modern Organizational Theory | |
| **H3:** The relation between communication factors and project success weakens when political factors increase. | Environmental Contingency Theory | [29–31] |
| **H4:** The relation between organizational factors and project success weakens when political factors increase. | Environmental Contingency Theory | [29–31] |

### *3.4. Conceptual Framework*

The three types of variables deployed in this study are mentioned in Figure 1. The independent variables are the two project-level CSFs, communication and organizational factors. Project success is the dependent variable, comprising factors such as time, cost,

and quality/scope. In addition, political factors, which are a category of the external environmental factors, are considered as moderating variables.

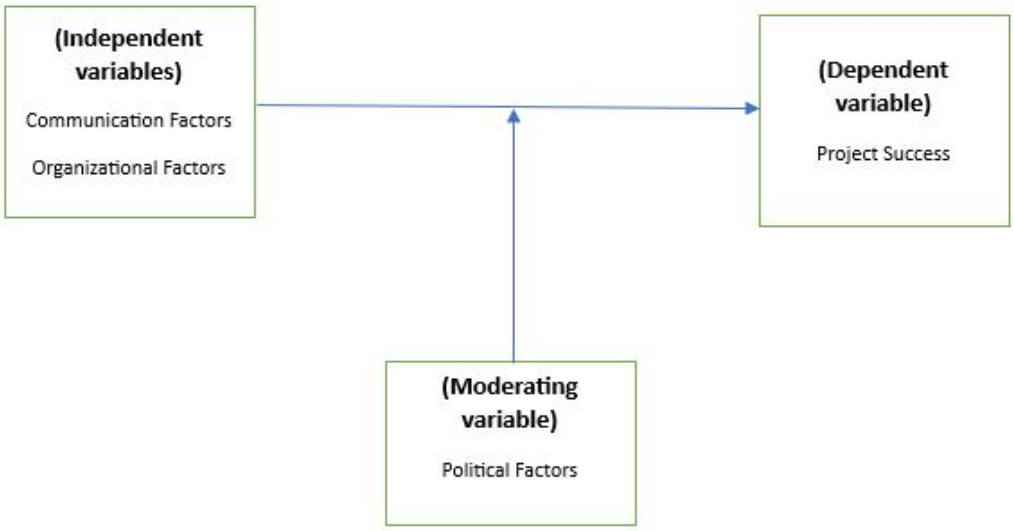


**Figure 1.** Conceptual research model.

## 4. Methodology

### *4.1. Research Approach*

This study deploys a quantitative questionnaire survey approach. It is a widely used approach which is not only scientific in terms of computing the data and relating the variables, but it also provides a reliable method to reach out to a broad sample of the total population [65]. This study involved five steps. In the first step, CSFs were identified and categorized from the literature. In the second step, the instrument for the data collection was designed. After that, engineering, procurement, and construction (EPC) firms and their third-party contractors involved in renewable energy projects in Pakistan were identified and approached to collect the data. Afterwards, the data were analyzed using bivariate correlation analysis (BCA) and structural equation modelling (SEM). Through BCA, the significant correlation values were determined, whereas SEM assisted in verifying the measurement model and testing of the hypothesis. The final step comprised the reporting of the outcomes and recommendations of this study.

### *4.2. Instrument Development*

The instrument finalized for the study was composed of three parts. The first part was composed of information to explain to the respondents about the purpose of the research. The second part was designed to capture the demographic profile of the respondents. In the third part, the respective questionnaire items for each of the four constructs used in the study were mentioned along with the five-point Likert scale (5 equals "strongly agree" and 1 equals "strongly disagree"). Before proceeding to the final data collection, the reliability and validity of the instrument was checked by conducting a pilot study. The subject experts—relevant university faculty members and doctoral students—critically reviewed the questionnaire and suggested a few modifications during the pilot study. Their recommendations were added to the questionnaire to increase the face validity and clarity of the final instrument.

### *4.3. Variables and Measures*

This study is composed of four variables: communication factors (CFs), organizational factors (OFs), political factors (PFs), and project success (PS). Amongst them, CFs and OFs are the independent variables, PS is the dependent variable, and PFs are the moderating variable. For this study, the scale to measure all the constructs was adopted from previously

published peer reviewed studies. In addition, all the constructs were treated as first-order constructs, which only represent a single layer of constructs, whereas a reflective measurement model was deployed to measure the constructs. The final questionnaire consisted of a total of 32 items measured along a five-point Likert scale (5 equals "strongly agree" and 1 equals "strongly disagree").

The communication factors are composed of ten items adopted from Sudhakar [56], Li [66], and Prabhakar [67]. This scale has been used by Maqbool [22], Maqbool et al. [21], and Maqbool et al. [26]. Its dimensions are displayed in Table 3. Based on the standard threshold value of Cronbach's alpha (CA) of 0.70 or higher [68], the value of 0.933 for CFs confirmed the reliability of this construct.

The dimensions and their sources through which the OFs were measured are displayed in Table 4. Numerous studies have used this scale already in their studies [21,22,26]. The CA value for OFs was 0.920, which is above the standard threshold value.

**Table 4.** Variables and their measures.

| Variables | Dimensions | Items | Source |
|---|---|---|---|
| Communication Factors (CFs) | Communication, leadership, relationship between client and project leadership, reduce ambiguity, maximize stability, cooperation, and balance between flexibility and rigidity. | 10 | [56,66,67] |
| Organizational Factors (OFs) | Top management support, realistic expectations, organizational politics, financial support, power, market intelligence, personal recruitment, business process re-engineering, reducing a cost base, increasing efficiency, and attrition. | 7 | [56] |
| Project Success (PS) | Within stipulated time, cost, quality, and stakeholder satisfaction. | 9 | [47,69] |
| Political Factors (PFs) | Stability of political environment, government support, government guarantees to developers, supporting legal framework, provision of secured land by the government, and sufficient funding by the government. | 6 | [40,64] |

For project success, a scale developed by Maqbool et al. [69] comprising nine items was used. This scale covered dimensions of project success based on time, cost, quality, and stakeholder satisfaction. The CA value of project success was 0.785, which was up to the standard.

To measure the political factors, a six-item scale was adopted from Musa et al. [64]. The dimensions of this scale covered the stability of the political government, support received for the project, guarantees ensured by the government, a thriving legal framework, provision of secured land, and adequate funding from the government. The CA value of PFs was 0.911.

### *4.4. Sample and Data Collection*

The "Unit of Analysis" for the current study comprises the human resources directly involved in the construction of renewable energy projects in Pakistan. These resources include project management professionals working as project director, project manager, functional manager, team leader, project site engineers, and other key staff. The solar power projects in the Sindh and Punjab province were identified and the survey questionnaire was administered randomly to 450 respondents. The respondents were approached directly by visiting head offices and project sites. A total of 273 responses were received, out of which 35 research questionnaires were incomplete, which made the target sample size consist of 238 respondents. The below-mentioned Table 5 highlights the demographic information of the data set.

**Table 5.** Respondents' demographic information.

| Characteristics | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 204 | 85.71 |
| | Female | 34 | 14.28 |
| Working Experience | 5–10 years | 150 | 63.02 |
| | 10–15 years | 61 | 25.63 |
| | Above 15 years | 27 | 11.34 |
| Positions | Project directors | 32 | 13.44 |
| | Managers | 91 | 38.23 |
| | Functional manager | 42 | 17.64 |
| | Leaders of the team | 34 | 14.28 |
| | Project site engineers | 24 | 10.08 |
| | Other staff | 15 | 6.30 |
| Education | Post-graduate | 53 | 22.26 |
| | Graduate | 110 | 46.21 |
| | Others | 75 | 31.51 |

## 5. Data Analysis and Results

To assess the data, a total of three tests were performed on the primary data. The data file was first transported to SPSS to check for any outliers, missing values, normality, and multicollinearity. There were no outliers found in the data, whereas the imputation method was deployed to treat the missing values in the data [70]. In the first step, descriptive analysis was conducted on SPSS to single out and report the sample demographics. For the next two steps, Smart PLS 4 was deployed to assess both the measurement and the structural models. In the second step, psychometric properties such as the reliability and validity of the constructs in the survey instrument were checked through the measurement model. Then, hypotheses were tested by measuring the paths in the research model. In addition, the bootstrapping technique was used to measure the *t*-values, *p*-values, and confidence intervals of the path coefficients.

### *5.1. Reliability and Validity Testing*

The first step in PLS-SEM is to examine the measurement model. The amount of error in any instrument is determined based on two key properties: reliability and validity. The reliability of an instrument determines the consistency, whereas the validity highlights whether the observed variables accurately assess the construct [65]. In addition, construct validity is attributed to the relatedness of observed values and includes convergent validity [71]. Also, the distinctiveness of the observed values is determined by discriminant validity. The below-mentioned Table 6 displays the key parameters of the measurement model, including factor loadings, Cronbach's alpha (CA), composite reliability (CR), and average variance extracted (AVE) values.

The factor loadings of items above the recommended value of 0.708 confirmed the item reliability [72]. These values indicate that the constructs explain more than 50 percent of the indicator's variance [73]. The permissible CA value is 0.7 or higher. CA values of all constructs in Table 6 are within the permissible range and are thus considered accurate. The composite reliability (CR) of the instrument determines the internal consistency reliability. The higher CR values ranging from 0.70 to 0.90 represent satisfactory to good criteria. In this case, CR falls within the permissible range of 0.70 to 0.95. In addition, the average variance extracted (AVE) values of all the constructs are greater than 0.50.

Discriminant validity represents the extent to which a construct is empirically distinct from other constructs in the structural model. The results of the heterotrait-monotrait ratio (HTMT) of the correlations are mentioned in Table 7. All constructs are discriminately valid as they are validated by the values of the HTMT matrix being significantly less than the threshold value of 0.85 [73]. According to Table 7, the AVE value of each construct is higher

in respective rows and columns than the highest squared inter-construct correlation of the same construct as well as all other constructs in the structural model [68].

**Table 6.** Convergent validity and reliability.

| Indicators | Loading | CA | CR | AVE |
|---|---|---|---|---|
| Communication factors | | 0.933 | 0.942 | 0.621 |
| CF1 | 0.747 | | | |
| CF2 | 0.761 | | | |
| CF3 | 0.853 | | | |
| CF4 | 0.832 | | | |
| CF5 | 0.808 | | | |
| CF6 | 0.780 | | | |
| CF7 | 0.764 | | | |
| CF8 | 0.753 | | | |
| CF9 | 0.844 | | | |
| CF10 | 0.727 | | | |
| Organizational factors | | 0.920 | 0.935 | 0.674 |
| OF1 | 0.806 | | | |
| OF2 | 0.839 | | | |
| OF3 | 0.871 | | | |
| OF4 | 0.839 | | | |
| OF5 | 0.746 | | | |
| OF6 | 0.827 | | | |
| OF7 | 0.812 | | | |
| Political factors | | 0.911 | 0.930 | 0.688 |
| PF1 | 0.867 | | | |
| PF2 | 0.762 | | | |
| PF3 | 0.864 | | | |
| PF4 | 0.827 | | | |
| PF5 | 0.852 | | | |
| PF6 | 0.798 | | | |
| Project success | | 0.926 | 0.938 | 0.628 |
| PS1 | 0.758 | | | |
| PS2 | 0.785 | | | |
| PS3 | 0.797 | | | |
| PS4 | 0.735 | | | |
| PS5 | 0.783 | | | |
| PS6 | 0.817 | | | |
| PS7 | 0.820 | | | |
| PS8 | 0.793 | | | |
| PS9 | 0.839 | | | |

Note: Loading, factor loading; CA, Cronbach's alpha; CR, composite reliability; AVE, average variance extracted.

**Table 7.** Discriminant validity–heterotrait-monotrait ratio (HTMT) matrix.

| No. | Factors | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | CF | | | | | |
| 2 | OF | 0.149 | | | | |
| 3 | PF | 0.083 | 0.063 | | | |
| 4 | PS | 0.180 | 0.274 | 0.167 | | |
| 5 | PF × OF | 0.049 | 0.072 | 0.023 | 0.485 | |
| 6 | PF × CF | 0.045 | 0.061 | 0.051 | 0.128 | 0.149 |

The issues in the collinearity in the reflective models are reflected by the variance inflation factor values (VIF). VIF values of five or higher represent collinearity issues in the constructs. Ideally, VIF values should be close to three or lower [71,72]. Table 8 showcases the VIF values of this study. With all the VIF values of SEM being less than three, the dimensions were free from the issue of collinearity.

**Table 8.** Collinearity analysis and model fitness.

| Dimension Correlation | VIF |
|---|---|
| CF and PS | 1.028 |
| OF and PS | 1.026 |
| PF and PS | 1.007 |
| PF × OF and PS | 1.033 |
| PF × CF and PS | 1.033 |

$R^2$ values determine the explanatory power of a model. Their reference range varies from 0 to 1, with 0.75, 0.50, and 0.25 demonstrating the substantial, moderate, and weak power [71]. Table 9 indicates the $R^2$ value which is moderate in terms of explaining its power between all constructs.

**Table 9.** $R^2$ and adjusted $R^2$ values.

| Constructs | $R^2$ | Adjusted $R^2$ |
|---|---|---|
| Project Success | 0.342 | 0.328 |

### *5.2. Descriptive Analysis*

The descriptive analysis of the variables is presented in Table 10. It details the pattern of data under examination through key measures of mean and standard deviation through a five-point Likert scale.

**Table 10.** Descriptive statistics.

| No. | Coding | Items | Min | Max | Mean | Std. Dev |
|---|---|---|---|---|---|---|
| 1 | CF1 | I believe communication creates an atmosphere for achieving project success. | 1 | 5 | 3.886 | 0.914 |
| 2 | CF2 | I believe there should be realistic expectations from management, user, and client to increase project success. | 1 | 5 | 3.873 | 0.914 |
| 3 | CF3 | I believe funder involvement is necessary to make a project successful. | 1 | 5 | 3.831 | 1.009 |
| 4 | CF4 | I believe customer involvement is necessary to make a project successful. | 1 | 5 | 3.768 | 0.990 |
| 5 | CF5 | I believe vendor partnership is necessary to make a project successful. | 1 | 5 | 3.819 | 1.038 |
| 6 | CF6 | I consider client acceptance influences project success. | 1 | 5 | 3.831 | 0.996 |
| 7 | CF7 | I believe availability of on-time information increases the probability of project success. | 1 | 5 | 3.852 | 0.985 |
| 8 | CF8 | I believe effective communication among project stakeholders helps to reduce any ambiguity. | 1 | 5 | 3.928 | 0.885 |
| 9 | CF9 | I believe maximum stability and cooperation could be attained by effective communication between project participants. | 1 | 5 | 3.852 | 1.031 |
| 10 | CF10 | I believe effective communication helps to create a balance between flexibility and rigidity during decision-making by project parties. | 1 | 5 | 3.810 | 1.016 |
| 11 | OF1 | The nature of my relationship with clients, as a member of a construction/engineering organization, affects project success. | 1 | 5 | 3.785 | 1.051 |

**Table 10.** *Cont.*

| No. | Coding | Items | Min | Max | Mean | Std. Dev |
|---|---|---|---|---|---|---|
| 12 | OF2 | I believe management support is necessary for the people working on project sites to use their capabilities. | 1 | 5 | 3.907 | 0.994 |
| 13 | OF3 | I believe financial support can have a constructive influence on project performance. | 1 | 5 | 3.920 | 0.927 |
| 14 | OF4 | I believe documentation of systems and procedures should be followed. | 1 | 5 | 3.899 | 1.034 |
| 15 | OF5 | I believe an organization should have realistic expectations regarding the work performance of project employees. | 1 | 5 | 3.941 | 0.855 |
| 16 | OF6 | I believe market intelligence is necessary for project organizations to judge ongoing trends in the current market. | 1 | 5 | 3.907 | 0.937 |
| 17 | OF7 | I believe project organizations should go for business process re-engineering according to the requirements of the business situation. | 1 | 5 | 3.937 | 0.905 |
| 18 | PF1 | I believe stability in the political situation of a country affects project success. | 1 | 5 | 3.241 | 1.161 |
| 19 | PF2 | I believe government support of renewable projects affects project success. | 1 | 5 | 3.203 | 1.080 |
| 20 | PF3 | I believe government guarantees play a significant role in timely implementation of a project. | 1 | 5 | 3.190 | 1.209 |
| 21 | PF4 | I believe the legal system is important for project stakeholders. | 1 | 5 | 3.190 | 1.107 |
| 22 | PF5 | I believe the provision of land helps to decide about investment in a project. | 1 | 5 | 3.270 | 1.156 |
| 23 | PF6 | I believe that adequate funding by government plays a significant role in timely achievement of project milestones. | 1 | 5 | 3.241 | 1.066 |
| 24 | PS1 | I always complete my assigned projects within the given timeframe. | 1 | 5 | 4.131 | 0.798 |
| 25 | PS2 | I always complete my projects within the assigned budget. | 2 | 5 | 4.135 | 0.745 |
| 26 | PS3 | I always fulfill the quality demands of the customers. | 1 | 5 | 4.110 | 0.799 |
| 27 | PS4 | I always satisfy my team associates. | 2 | 5 | 4.105 | 0.775 |
| 28 | PS5 | I always manage to get stakeholders' satisfaction with the project deliverables. | 1 | 5 | 4.127 | 0.801 |
| 29 | PS6 | I always achieve project owners' satisfaction with project deliverables. | 1 | 5 | 4.135 | 0.773 |
| 30 | PS7 | I always ensure suppliers' satisfaction. | 1 | 5 | 4.122 | 0.825 |
| 31 | PS8 | I always achieve a project's purpose. | 1 | 5 | 4.114 | 0.811 |
| 32 | PS9 | I am assured that projects assigned to me have reached their self-defined success measures. | 1 | 5 | 4.118 | 0.863 |

### *5.3. Hypothesis Testing*

The estimates of the structural model were obtained by setting bootstrapping at 5000 subsamples. The t values, *p* values, and confidence interval values are displayed in Table 11,. The first hypothesis, H1, assumed the significant and positive impact of CFs on PS. This hypothesis was confirmed, and it was found to strongly support the impact of CFs on PS with a value of $\beta = 0.260$, along with a $t$ value = 3.937 and $p$ value = 0.000. The beta value of this path shows that one unit change in CFs can bring a 26% change in PS. According to Jugdev and Muller (2005), there is a significant relationship between

communication factors and PS [49]. The H1 hypothesis is also supported by previous studies within the context of renewable energy projects in Pakistan [22,23,26].

**Table 11.** Path coefficients.

| Hypothesis | Relationship | Coefficient | Mean | SD | T Statistic | *p* Value | Confidence Interval | | Findings |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower Limit | Upper Limit | |
| H1 | CF-PS | 0.195 | 0.217 | 0.049 | 4.002 | 0.000 | 0.146 | 0.295 | Significant |
| H2 | OF-PS | 0.268 | 0.272 | 0.057 | 4.685 | 0.000 | 0.185 | 0.359 | Significant |
| H3 | PF-CF and PS | 0.075 | 0.078 | 0.064 | 1.165 | 0.244 | −0.027 | 0.183 | Insignificant |
| H4 | PF-OF and PS | −0.422 | −0.404 | 0.071 | 5.977 | 0.000 | −0.494 | −0.294 | Significant |

The second hypothesis referred to the positive impact of OFs on PS. The β value of 0.268, supported by a *t* value = 5.049 and *p* value = 0.000, shows the significant and direct impact of OFs towards PS. The beta value denotes that one unit change in OFs can bring a 26.4% change in PS. The significant relationship of OFs and PS is also established by previous studies that tested the same hypothesis with respect to renewable energy projects in Pakistan [21,22,26].

The third hypothesis states that PFs moderate the relationship between CFs and PS. The β value of −0.063, along with a *t* value of 0.450 and *p* value of 0.653, shows the insignificant path. Therefore, hypothesis H3 was rejected.

The fourth hypothesis, H4, speculated that PFs weaken the relationship between OFs and PS. The β value of −0.422 was found to be statistically significant, with a *t* value of 5.706 and *p* value of 0.000. It also confirmed the hypothesis H4. The net negative value of β (0.268 − 0.422 = −0.154) indicates the presence of significant moderation effects by PFs, which weaken the relationship between OFs and PS. The interaction plot of political factors displayed in Figure 2 shows that under the low effect scenario of political factors, the PS increases as OFs increase. However, the high effect scenario of political factors shows that PS decreases as OFs increase, demonstrating the significant impact of political factors.

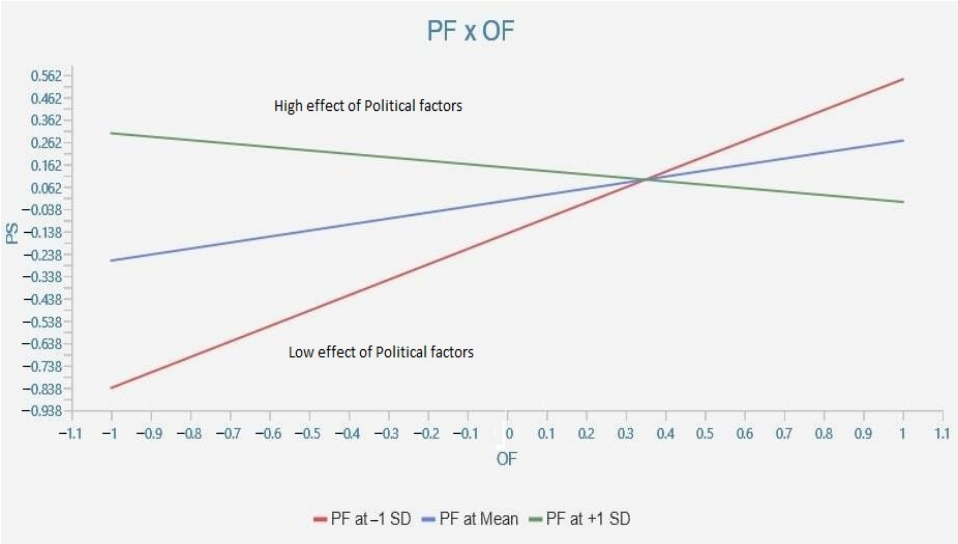


**Figure 2.** Slope diagram demonstrating the moderating role of PFs on OFs and PS.

## 6. Discussion

This study provides key insights for professionals, project management practitioners, and researchers associated with the implementation of renewable energy projects. The study finds the relationship of project success with two project specific CSFs: communication and organizational factors. It also finds how this relationship fares when exposed to political factors within the external environment of projects. The results of this study as shown

in Figure 3 show that both the selected CSFs positively and significantly affect a project's success.

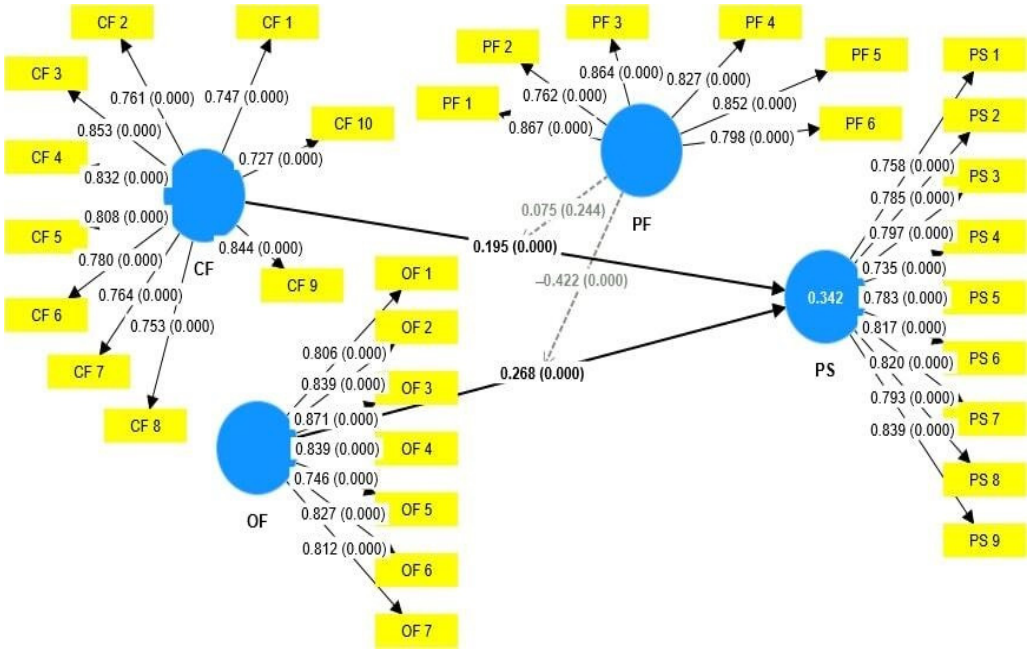


**Figure 3.** Path coefficients of the theoretical model.

The outcome of the first hypothesis shows the connection between CFs and PS. Their significant relationship is attributed to effective communication between stakeholders. The results reveal that effective communication among project managers, funders, vendors, and top management exists, whereas uninterrupted communication channels increase a project's success. The findings of this study are similar to findings in earlier studies [50,51]. They highlight that, without a clear and concise communication plan, effective project delivery is not possible. The previous studies within the context of Pakistan also support the results of this study [21,23,24].

The results after testing the second hypothesis reveal a strong linkage of OFs with PS. The significant relationship between these factors highlights the fact that successful projects are dependent on the extent of management support and realistic expectations set by top management towards project, line, and functional managers. In addition, the results reveal that market intelligence is essential for the project firms to respond to changes. These results of this study are supported by numerous studies [21,39,56]. The results also suggest that construction, procurement, and availability of financing depends on the management capability of the involved firms.

The outcome of the third hypothesis reveals that PFs have an insignificant impact on the relationship between CFs and PS. This is perhaps due to prevailing effective communication channels among project teams, vendors, clients, and donors. This indicates that the robust communication channels in the selected projects not only kept stakeholder engagement unaffected, but it also facilitated managers to make key decisions based on available information.

The results of the fourth hypothesis highlight that PFs weaken the relationship between OFs and PS. This line of enquiry is a novel contribution to the literature and supports the claim that other than prevailing political instability in Pakistan, weak governance, an unsupportive legal framework, and lack of financial and institutional support cause bottlenecks for project stakeholders. The prevalence and the nature of political factors within Pakistan are relatable to political factors found in other developing countries. Policy support is indispensable to making sure that tariffs are economical and firms can pay back their investments and other operational expenses. The major causes attributed to the failure

of Pakistan's first 2006 renewable energy policy include regulatory insufficiency, high upfront costs, lack of proper subsidies, and lack of institutional coordination [74]. Similarly, in the case of Mozambique, incentives and tax breaks were generalized to cater to the needs of all the industries [14]. Such unclear and non-specific policies caused bottlenecks for project firms to continue their operations and meet timelines.

The prevailing policy regime in Pakistan is also fraught with bottlenecks. The current 2019 Alternative and Renewable Energy (ARE) policy proposed to withhold tax exemptions given to project developers in the wake of reducing import dependence and boosting local economies. However, project developers suffered issues in initiating projects as the local manufacturing industry could not meet the demands of project firms [75]. Similar issues were faced by project developers in Sri Lanka, who had to deal with higher taxes imposed by the government on the import of materials and machinery [17]. In addition, the right of sole ownership of land is another challenge in Pakistan due to it being under the possession of the provinces. The lack of coordination between the federal government and provinces raises issues for project firms in finding and leasing the best location for their plants. The regulatory regime of Nigeria is also characterized by complications in land allotment, wherein securing permits for land is a major bottleneck for project developers [16]. Therefore, the results of this study are supported by previous studies, which provide evidence from Asian, European, and North American countries that regulatory and political barriers are amongst the top three barriers for energy projects [43]. These issues take a higher toll on project staff and managers. As such, the political factors also make it increasingly difficult for firms to scan the external environment and make changes to ensure timely completion of the projects.

## 7. Conclusions

Despite accelerated global efforts to transform the global energy sector in the aftermath of the 2015 Paris Agreement, the growth of dispatchable renewables remains limited. Pakistan is a developing country which has a lopsided energy mix towards imported fossil fuels. It is in Pakistan's own interest to induce more renewable projects and timely completion of ongoing projects in the wake of reducing dependence on expensive and imported unclean fuel sources. However, implementation of renewable projects in Pakistan is subject to factors which are both within and outside the control of projects firms, factors that have the capacity to change the outcome of energy projects in terms of time, scope, and cost. This study investigated the impact of two key internal success factors—communication and organizational factors—on the success of renewable energy projects in Pakistan. In addition, this study also established the impact of political factors on the relationship between communication and organizational factors in terms of a project's success.

The results of this study indicate that the organizational capacities of firms in the construction of renewable energy projects in Pakistan have a direct bearing on a project's success. Firms which have established systems and procedures to implement projects, a lack of financial issues, and outright support for managers and on-site staff significantly influence the success of renewable energy projects. In addition, the flow of information and ease of communication not only helps project stakeholders to interact freely, but effective communication channels also help firms anticipate and adapt to ongoing trends. From the perspective of the impact of external environmental factors, political factors are active within Pakistan, which not only restricts the capabilities of firms to complete projects but also inhibits renewable energy transition in the country. The findings also suggest that political factors are beyond the control of project firms and can only be controlled by governments.

### *7.1. Theoretical Findings*

The findings of the present study give key insights which enable a deeper understanding of project level CSFs and how they are affected by external environmental factors. The study proposes a new model which includes the moderating impact of external environ-

mental factors on the way project firms execute renewable energy projects. This study makes its theoretical contribution by appreciating the relationship between project firms and the external environment. The contingency approach to management presumes that organizations and situations are subject to changes. Firstly, the results of this study make a contribution to the theory by showing that external environmental factors not only cause barriers for project firms, but they also weaken their capacity to deploy general problem-solving methods for various tasks and problems. The second contribution provides insight into how a tailored response is required to deal with specific circumstances. On one hand, there are different categories of external environments, which have different impacts on project firms. On the other hand, projects in different environments are subjected to the external environment in different ways. Thirdly, the unique model in this study lays the foundation for new models that could be replicated to explore the impact of other external environmental factors, such as economic, social, and force majeure events, on various project level factors.

### *7.2. Practical Implications of the Study*

The results of this study are relevant to policymakers, government representatives, project managers, practitioners, and academicians with a particular interest in renewable energy transition. In the context of project firms aiming to have a strong foothold in the renewable energy projects industry, a viable and effective communication strategy at the outset of the project is required. Secondly, renewable energy firms must enhance support for their teams and invest in strengthening the capacity of project managers. Based on the results from market intelligence, project managers can make timely adaptations to external changes. Thirdly, projects firms and their planners need to be wary of the political situation in the countries where they plan to set up renewable energy projects. Before embarking on projects in Pakistan and elsewhere, firms must pay attention to the political stability of the country, supply chain issues related to equipment, expropriation of financing, and possible conflicts regarding land lease agreements. Conversely, meticulous integrated planning is required by host governments, through which apprehensions of firms can be reduced. Required initiatives from governments include reforms to the legal system, ensuring availability of financing and reductions in duties and taxes, removal of barriers to the import of equipment, addressing issues in renewable energy policies, and enhancing coordination among the institutions.

### *7.3. Limitations and Avenues for Future Research*

Despite highlighting the importance of CSFs in the completion of renewable energy projects in Pakistan, there are still limitations to this study. Firstly, the data set for this study comprised respondents from solar power projects. Alongside solar power plants, wind power plants were also installed in Pakistan, which also need to corroborate the impact of political factors. Secondly, this study only considered political factors as a domain of external factors, whereas, in a cash-strapped economy such as Pakistan's, the impacts of economic, social, and force majeure events such as the COVID-19 pandemic cannot be neglected. Therefore, future studies assessing the impact of other external factors are likely to bring more understanding to the literature. Thirdly, the team factors which are a key attribute of the project-level CSFs, are missing from the scope of this research. The addition of these factors in the future studies will also enlighten the literature in terms of how teams respond to the external forces.

**Author Contributions:** Conceptualization, M.H. and Q.Y.; methodology, M.H. and Q.Y.; software, M.H.; formal analysis, M.H. and Q.Y.; resources, Q.Y.; writing—original draft preparation, M.H.; writing—review and editing, M.H. and Q.Y.; supervision, Q.Y.; project administration, M.H. and Q.Y.; funding acquisition, Q.Y. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the National Natural Science Foundation of China through grant no. 72271022, 71872011, and 71929101.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** All the necessary information is mentioned in the manuscript.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. UNEP. Emissions Gap Report 2022. Available online: https://www.unep.org/resources/emissions-gap-report-2022#:~:text=Yet%20the%20Emissions%20Gap%20Report,transformation%20can%20avoid%20climate%20disaster (accessed on 24 December 2022).
2. IEA. Renewables 2022. Available online: https://www.iea.org/reports/renewables-2022/executive-summary (accessed on 13 January 2023).
3. The World Bank. Solar Photovoltaic Power Potential by Country. Available online: https://www.worldbank.org/en/topic/energy/publication/solar-photovoltaic-power-potential-by-country (accessed on 25 January 2023).
4. NEPRA. State of Industry Report 2021–22. Available online: https://nepra.org.pk/publications/State%20of%20Industry%20Reports.php (accessed on 12 November 2022).
5. Mirjat, N.H.; Uqaili, M.A.; Harijan, K.; Das Valasai, G.; Shaikh, F.; Waris, M. A Review of Energy and Power Planning and Policies of Pakistan. *Renew. Sustain. Energy Rev.* **2017**, *79*, 110–127. [CrossRef]
6. GoP. Energy projects under CPEC. Available online: https://cpec.gov.pk/energy (accessed on 7 October 2022).
7. NTDC. Available online: https://ntdc.gov.pk/ntdc/public/uploads/downloads/NTDC.PSP.IGCEP.pdf (accessed on 24 January 2023).
8. Berman, N. What's at Stake in Pakistan's Power Crisis. Available online: https://www.cfr.org/in-brief/whats-stake-pakistans-power-crisis (accessed on 12 January 2023).
9. AEDB. Current Status. Available online: https://www.aedb.org/ae-technologies/solar-power/solar-current-status (accessed on 12 January 2023).
10. Ghimire, L.P.; Kim, Y. An Analysis on Barriers to Renewable Energy Development in the Context of Nepal Using AHP. *Renew. Energy* **2018**, *129*, 446–456. [CrossRef]
11. Zhou, S.; Yang, P. Risk Management in Distributed Wind Energy Implementing Analytic Hierarchy Process. *Renew. Energy* **2020**, *150*, 616–623. [CrossRef]
12. Sambodo, M.T.; Yuliana, C.I.; Hidayat, S.; Novandra, R.; Handoyo, F.W.; Farandy, A.R.; Inayah, I.; Yuniarti, P.I. Breaking Barriers to Low-Carbon Development in Indonesia: Deployment of Renewable Energy. *Heliyon* **2022**, *8*, e09304. [CrossRef]
13. Yudha, S.W.; Tjahjono, B. Stakeholder Mapping and Analysis of the Renewable Energy Industry in Indonesia. *Energies* **2019**, *12*, 602. [CrossRef]
14. Soares, C.A.; Shendrikova, D.; Crevani, G.; Silinto, B.; Colombo, E. Enabling Factors for the Development of Mini-Grid Solutions in Mozambique: A PESTLE-Based Analysis. *Energy Strateg. Rev.* **2023**, *45*, 101040. [CrossRef]
15. Zalengera, C.; Blanchard, R.E.; Eames, P.C.; Juma, A.M.; Chitawo, M.L.; Gondwe, K.T. Overview of the Malawi Energy Situation and A PESTLE Analysis for Sustainable Development of Renewable Energy. *Renew. Sustain. Energy Rev.* **2014**, *38*, 335–347. [CrossRef]
16. Ohunakin, O.S.; Adaramola, M.S.; Oyewola, O.M.; Fagbenle, R.O. Solar Energy Applications and Development in Nigeria: Drivers and Barriers. *Renew. Sustain. Energy Rev.* **2014**, *32*, 294–301. [CrossRef]
17. Kumarasiri, B.; Dissanayake, P. Barriers to Implementing Waste-to-Energy Projects in Sri Lanka: A PESTEL Analysis. *Built Environ. Proj. Asset Manag.* **2021**, *11*, 544–558. [CrossRef]
18. Oikonomou, E.K.; Kilias, V.; Goumas, A.; Rigopoulos, A.; Karakatsani, E.; Damasiotis, M.; Papastefanakis, D.; Marini, N. Renewable Energy Sources (RES) Projects and Their Barriers on a Regional Scale: The Case Study of Wind Parks in the Dodecanese Islands, Greece. *Energy Policy* **2009**, *37*, 4874–4883. [CrossRef]
19. Nasirov, S.; Silva, C.; Agostini, C.A. Investors' Perspectives on Barriers to the Deployment of Renewable Energy Sources in Chile. *Energies* **2015**, *8*, 3794–3814. [CrossRef]
20. Donastorg, A.; Renukappa, S.; Suresh, S. Evaluating Critical Success Factors for Implementing Renewable Energy Strategies in the Dominican Republic. *Renew. Energy* **2020**, *149*, 329–335. [CrossRef]
21. Maqbool, R.; Sudong, Y. Critical Success Factors for Renewable Energy Projects; Empirical Evidence from Pakistan. *J. Clean. Prod.* **2018**, *195*, 991–1002. [CrossRef]
22. Maqbool, R. Efficiency and Effectiveness of Factors Affecting Renewable Energy Projects; an Empirical Perspective. *Energy* **2018**, *158*, 944–956. [CrossRef]
23. Faiz, S.; Chin, T.; Wang, M.; Asghar, A.; Khan, A. Exploring the Role of Organizational Support, and Critical Success Factors on Renewable Energy Projects of Pakistan. *Energy* **2022**, *243*, 12276.
24. Wang, B.; Rasool, S.F.; Zhao, Y.; Samma, M.; Iqbal, J. Investigating the nexus between critical success factors, despotic leadership, and success of renewable energy projects. *Environ. Sci. Pollut. Res.* **2021**, *29*, 10388–10398. [CrossRef] [PubMed]

25. Maqbool, R.; Rashid, Y.; Ashfaq, S. Renewable energy project success: Internal versus external stakeholders' satisfaction and influences of power-interest matrix. *Sustain. Dev.* **2022**, *30*, 1542–1561. [CrossRef]
26. Maqbool, R.; Deng, X.; Rashid, Y. Stakeholders' Satisfaction as a Key Determinant of Critical Success Factors in Renewable Energy Projects. *Energy Sustain. Soc.* **2020**, *10*, 28. [CrossRef]
27. Scott, W.G. Organizational Theory An Overview and an Appraisal. *J. Acad. Manag.* **1961**, *4*, 7–26. [CrossRef]
28. Shafritz, J.M.; Ott, J.S.; Jang, Y.S. *Classics of Organization Theory*, 8th ed.; Cengage Publishing: Boston, MA, USA, 2011; ISBN 978-1-285-87027-4.
29. Hatch, J.M.; Cunliffe, A.L. *Theory Organization: Modern, Symbolic and Postmodern Perspectives*, 3rd ed.; Oxford University Press: Oxford, UK, 2018; ISBN 9780199640379.
30. Helms, M.M. *Encyclopedia of Management*, 5th ed.; Thomson Gale: Detroit, MI, USA, 2006; ISBN 8007624058.
31. Leeman, J.; Wangen, M.; Kegler, M.; Lee, M.; Leary, M.C.O.; Ko, L.K.; Fernández, M.E.; Birken, S.A. Applying Theory to Explain the Influence of Factors External to an Organization on the Implementation of an Evidence-Based Intervention. *Front. Heal. Serv.* **2022**, *2*, 889786. [CrossRef]
32. Burns, T.; Stalker, G.M. *The Management of Innovation*, 1st ed.; Oxford University Press: Tavistock, UK, 1994; ISBN 9780191684630.
33. Daniel, D.R. Management Information Crisis. *Harv. Bus. Rev.* **1961**, *39*, 111–121.
34. Pinto, J.K.; Slevin, D.P. Project Success: Definitions and Measurement Techniques. *Proj. Manag. J.* **1988**, *19*, 67–72.
35. Leidecker, J.K.; Bruno, A.V. Identifying and Using Success Factors. *Long Range Plann.* **1984**, *17*, 23–32. [CrossRef]
36. Freund, Y.P. Critical Success Factors. *Planin. Rev.* **2006**, *16*, 20–23. [CrossRef]
37. Pinto, J.K.; Slevin, D.P. Critical Success Factors in Effective Project Implementatio. In *Project Management Handbook*, 2nd ed.; Cleland, D.I., King, W.R., Eds.; Van Nostrand Reinhold: New York, NY, USA, 1988; pp. 902–909.
38. Baccarini, D.; Collins, A. Critical Success Factors for Projects. In Proceedings of the 17th ANZAM Conference, Fremantle, Australia, 2–5 December 2003.
39. Zhao, Z.Y.; Zuo, J.; Zillante, G. Factors Influencing the Success of BOT Power Plant Projects in China: A Review. *Renew. Sustain. Energy Rev.* **2013**, *22*, 446–453. [CrossRef]
40. Zhao, Z.Y.; Zuo, J.; Zillante, G.; Wang, X.W. Critical Success Factors for BOT Electric Power Projects in China: Thermal Power versus Wind Power. *Renew. Energy* **2010**, *35*, 1283–1291. [CrossRef]
41. Ika, L.A.; Diallo, A.; Thuillier, D. Critical Success Factors for World Bank Projects: An Empirical Investigation. *JPMA* **2012**, *30*, 105–116. [CrossRef]
42. Goh, H.H.; Lee, S.W.; Chua, Q.S.; Goh, K.C.; Kok, B.C.; Teo, K.T.K. Renewable Energy Project: Project Management, Challenges and Risk. *Renew. Sustain. Energy Rev.* **2014**, *38*, 917–932. [CrossRef]
43. Othman, K.; Khallaf, R. Identification of the Barriers and Key Success Factors for Renewable Energy Public-Private Partnership Projects: A Continental Analysis. *Buildings* **2022**, *12*, 1511. [CrossRef]
44. Belassi, W.; Tukel, O.I. A New Framework for Determining Critical Success / Failure Factors in Projects. *Int. J. Proj. Manag.* **1996**, *14*, 141–151. [CrossRef]
45. Baccarini, D. The Logical Framework Method for Defining Project Success. *Proj. Manag. J.* **1999**, *30*, 25–32. [CrossRef]
46. Atkinson, R. Project Management: Cost, Time and Quality, Two Best Guesses and a Phenomenon, Its Time to Accept Other Success Criteria. *Int. J. Proj. Manag.* **1999**, *17*, 337–342. [CrossRef]
47. Müller, R.; Turner, R. The Influence of Project Managers on Project Success Criteria and Project Success by Type of Project. *Eur. Manag. J.* **2007**, *25*, 298–309. [CrossRef]
48. Baker, B.N.; Murphy, D.C.; Fisher, D. Factors Affecting Project Success. In *Project Management Handbook*, 2nd ed.; Cleland, I.P., King, R.W., Eds.; John Wiley and Sons: New York, NY, USA, 1988; pp. 902–919.
49. Jugdev, K.; Müller, R. A Retrospective Look at Our Evolving Understanding of Project Success. *Proj. Manag. J.* **2005**, *36*, 19–31. [CrossRef]
50. Cervone, H.F. Effective Communication for Project Success. *OCLC Systmes Serv. Int. Digit. Libr. Perspect.* **2014**, *30*, 74–77.
51. Ramsing, L. Project Communication in a Strategic Internal Perspective. *Corp. Commun. An Int. J.* **2009**, *14*, 345–357. [CrossRef]
52. Callegari, C.; Szklo, A.; Schaeffer, R. Cost Overruns and Delays in Energy Megaprojects: How Big Is Big Enough? *Energy Policy* **2018**, *114*, 211–220. [CrossRef]
53. Arditi, D.; Nayak, S.; Damci, A. Effect of Organizational Culture on Delay in Construction. *Int. J. Proj. Manag.* **2017**, *35*, 136–147. [CrossRef]
54. Zwikael, O. Top Management Involvement in Project Management Exclusive Support Practices for Different. *Int. J. Manag. Proj. Bus.* **2014**, *1*, 387–403. [CrossRef]
55. Young, R.; Jordan, E. Top Management Support: Mantra or Necessity? *Int. J. Proj. Manag.* **2008**, *26*, 713–725. [CrossRef]
56. Sudhakar, G.P. A Model of Critical Success Factors for Software Projects. *J. Enterp. Inf. Manag.* **2012**, *25*, 537–558. [CrossRef]
57. Khang, D.B.; Moe, T.L. Success Criteria and Factors for International Development Projects: A Life Cycle Based Framework. *Proj. Manag. J.* **2008**, *39*, 72–84. [CrossRef]
58. Sekar, G.; Sambasivan, M.; Viswanathan, K. Does Size of Construction Firms Matter ? Impact of Project-Factors and Organization-Factors on Project Performance. *Built Environ. Proj. Asset Manag.* **2020**, *11*, 174–194. [CrossRef]
59. De Wit, A. Measurement of Project Success. *Int. J. Proj. Manag.* **1988**, *6*, 164–170. [CrossRef]

60. Chan, A.P.C.; Scott, D.; Chan, A.P.L. Factors Affecting the Success of a Construction Project. *J. Constr. Eng. Manag.* **2004**, *130*, 153–155. [CrossRef]
61. Hussain, A.; Jamil, M.; Farooq, M.U.; Asim, M.; Rafique, M.Z.; Pruncu, C.I. Project Managers ' Personality and Project Success: Moderating Role of External Environmental Factors. *Sustainability* **2021**, *13*, 9477. [CrossRef]
62. Voss, M.; Kock, A. Impact of Relationship Value on Project Portfolio Success—Investigating the Moderating Effects of Portfolio Characteristics and External Turbulence. *Int. J. Proj. Manag.* **2013**, *31*, 847–861. [CrossRef]
63. Ashley, D.B.; Bonner, J.J. Political Risks in International Construction. *J. Constr. Eng. Manag.* **1987**, *113*, 447–467. [CrossRef]
64. Musa, M.M.; Amirudin, R.B.; Sofield, T. Influence of External Environmental Factors on the Success of Public Housing Projects in Developing Countries. *Constr. Econ. Build.* **2015**, *15*, 30–44. [CrossRef]
65. Balnaves, M.; Caputi, P. Introduction to Quantitative Research Methods: An Investigative Approach, 1st ed.Sage Publications: London, UK, 2001; ISBN 0-7619-6803-2.
66. Li, E.Y. Perceived Importance of Information System Success Factors: A Meta Analysis of Group Differences. *Inf. Manag.* **1997**, *32*, 15–28. [CrossRef]
67. Prabhakar, G.P. What Is Project Success: A Literature Review. *Int. J. Bus. Manag.* **2008**, *3*, 3–10. [CrossRef]
68. Hair, J.F., Jr.; Sarstedt, M.; Hopkins, L.; Kuppelwieser, V.G. Partial Least Squares Structural Equation Modeling (PLS-SEM) An Emerging Tool in Business Research. *Eur. Bus. Rev.* **2014**, *26*, 106–121. [CrossRef]
69. Maqbool, R.; Sudong, Y.; Manzoor, N.; Rashid, Y. The Impact of Emotional Intelligence, Project Managers' Competencies, and Transformational Leadership on Project Success: An Empirical Perspective. *Proj. Manag. J.* **2017**, *48*, 58–75. [CrossRef]
70. Tabachnick, B.G.; Fidell, L.S. *Using Multivariate Statistics*, 5th ed.; Pearson Education: Boston, MA, USA, 2006; ISBN 0-205-45938-2.
71. Hair, J.F.; Hult, G.T.M.; Ringle, C.M.; Sarstedt, M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 2nd ed.; Sage Publications: Los Angeles, CA, USA, 2017.
72. Hair, J.F.; Risher, J.J.; Sarstedt, M.; Ringle, C.M. When to Use and How to Report the Results of PLS-SEM. *Eur. Bus. Rev.* **2018**, *31*, 2–24. [CrossRef]
73. Ghasemy, M.; Teeroovengadum, V.; Becker, J.M.; Ringle, C.M. This Fast Car Can Move Faster: A Review of PLS-SEM Application in Higher Education Research. *High. Educ.* **2020**, *80*, 1121–1152. [CrossRef]
74. Zafar, U.; Rashid, T.U.; Khosa, A.A.; Khalil, M.S.; Rashid, M. An Overview of Implemented Renewable Energy Policy of Pakistan. *Renew. Sustain. Energy Rev.* **2018**, *82*, 654–665. [CrossRef]
75. Mittha, M. Renewable Energy Policy in Pakistan: A Critique. Available online: https://courtingthelaw.com/2021/04/19/commentary/renewable-energy-policy-in-pakistan-a-critique/ (accessed on 6 December 2022).