Iranian Journal of Economic Studies, 10(2) 2021, 265-291

Shiraz University

Iranian Journal of Economic Studies

Journal homepage: ijes.shirazu.ac.ir

Impact of Public-Private Partnership on Trade: Free Zones of Iran

Fatemeh Etemadmoghaddam[a], Majid Sameti[b*], Sara Ghobadi[a], Mansour Mahinizadeh[d]

a. Department of Economics, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran.
b. Department of Economics, University of Isfahan, Isfahan, Iran.
c. Faculty of Economics, Management and Accounting, Yazd University, Yazd, Iran.

Article History

Received date: 26 November2021
Revised date: 22 July 2022
Accepted date: 04 September 2022
Available online: 14 November 2022

JEL Classification
C10
F19
O19

Keyword
Public- Private Partnership
Trade Facilitation
Structural Equation Modeling
Free Zone

Abstract

In an effort to achieve economic growth and development, to eliminate or minimize the traditional barriers of trade, trade facilitation (TF), and increase international trade, free trade zones in Iran were founded. In this regard, part of the solution to increasing countries' international trade is provided by Public-Private Partnerships. Since trade facilitation includes a relationship between the Public and Private sectors, this type of partnership is especially important in trade facilitation. The purpose of this research is to evaluate the relationship of the factors that have the greatest impact on TF-oriented PPPs in the free zones and these factors derive from the theory of PPPs. Qualitative data was collected focusing on private, public, and academic sector professionals involved in free zones and trade by a researcher-made questionnaire. The Structural Equation Modeling (SEM) strategy was utilized to look at the model and test the research hypotheses. Of the 5-hypothesis proposed by this study, four hypotheses were confirmed and one was rejected. The results have shown that the variables of private sector abilities, the micro-environment factors, and the macro-environment factors, in that arrange, have the foremost impact on TF-oriented PPPs and TF-oriented PPPs have a strong relationship to trade facilitation. Therefore, the use of TF-oriented PPPs in free zones can have a positive effect on trade facilitation, and the development of TF dimensions will also lead to trade facilitation in Iran's free zones.

Highlights

- Private sector abilities are important to improve the performance of TF-oriented PPFs.
- The performance of business-oriented PPPs improves trade facilitation.
- TF Oriented PPPs have a strong relationship to trade facilitation.

* majidsameti@ase.ui.ac.ir
DOI: 10.22099/ijes.2022.42167.1799

1. Introduction

An increase in the volume of trade has led countries, with different laws and political systems and various development plans, to consider expanding their business activities as a necessity. Countries design and implement various programs to achieve their development goals to increase their efficiency and effectiveness in international trade based on available resources and facilities. Since one of the most important goals of governments is to achieve economic growth and increase the welfare of society, it is necessary to pay attention to the capacities of each country, given that the flow of trade is growing rapidly.

Trade facilitation (TF) is increasingly accorded a high priority in today's interconnected world and exchange supply chain environment. From a trading outlook, TF is commonly translated as the facilitation of legitimate trade while ensuring regulatory controls on trade. In viable terms, it may be characterized as the simplification, harmonization, standardization, and modernization of border procedures (Moïsé, 2013).

Free zones can be considered as one of the main pillars in the growth and facilitation of trade in countries, especially in developed countries, however, their role in increasing exports, and increasing the volume of trade and investment are important. In itself, the facilitation of laws and structural protections of the free zone will lead to the formation and continuation of their activities. (Chen et al., 2018).

While Free Zones have a unique position in international trade in goods and services, stakeholders also play an important role in facilitating global trade. Since measures to facilitate trade can be included a joint commitment between the Private and the Public sector, the advancement of their interactions and the improvement of commercial infrastructure can be defined as the Public-Private Partnership (PPP). Even though classic PPPs tend to provide more infrastructures, a few are established having the preparation of service as their target. Within the field of international trade, this specific sort of PPP is seen as a Customer-Business Partnership (CBP) and distinguishes the preferences and dangers of classic PPPs. In this way, governments and businesses can take part in the advancement of a particular plan that combines their mutual profits (Campos et al., 2018). This too happens within the free zones, customs, and worldwide trade. A few of these PPPs, as they are called, are TF oriented, and can be found in the interior of the ordinary PPP universe.

Insufficient information is known on the figure of PPP in TF, including free zones. Paying attention to the research gap in the role of private and public sector participation in trade facilitation and development and appearing that governments and businesses can shape associations for the advancement of a given project in a free zone, which combines their mutual interests, is the main issue of this research. In the law on the establishment of Iran's free zones, encouraging policies have been approved for the entry of the private sector into these zones, for example, tax exemption for all types of economic activities for 20 years, and foreign trade is also exempted from paying taxes and fees.

According to the report of the Secretariat of Free Zones of Iran, in 2021, for the first time in 30 years, the trade balance of these zones has become positive, and 31% of the country's exports have been made from the 7 active free zones of Iran. This is while the export potential of these regions is much more and to achieve this capacity, the necessary infrastructure must be provided with the participation of the private and public sectors. 7 active free zones of Iran include Qeshm, Kish, Chabahar, Arvand, Aras, Jolfa, and Anzali, all of these free zones have legal unity.

The purpose of this research is to evaluate the components influencing the efficiency of a TF-oriented PPP in free zones in Iran. Such an objective draws from the theory of PPP and the relationship between each of the components and the execution of a partnership. Determining the strength of such relationships has been done using Structural Equation Modeling (SEM). Therefore, this study seeks to answer the research problem: Which factors most affect the success of TF-based PPPs in free zones and ultimately trade facilitation?

According to the literature, it seems that SEM has not been used to analyze factors related to trade facilitation and free zones, such as the performance of TF-oriented PPPs, and no research has been presented in this regard. In general, no study has been done on the effects of PPP in the sectors related to free zones, while this article helps to gain new insight into the different functions of PPP. Therefore, the originality of this work helps to evaluate the impact of its factors on the prosperity of trade in free zones, considering the emergence of PPP issues in TF and FZ.

The next part outlines the theoretical establishments upon which the paper is established and draws on both conceptual and empirical literature to expand the research hypotheses. The methodology utilized to reply to the research question is afterward explained. Then data analysis is performed by the structural equation method. The final section of the paper presents the finding and talked about the research suggestions.

2. Theoretical Foundation and Literature Review

2.1 Public-Private Partnership (PPP)

Although there is no single definition for PPP, according to Felsinger's (2005) definition, "Public-Private Partnership" portrays an extent of conceivable connections between public and private institutes in infrastructure and other administrations and the results are for all the beneficiaries. PPP is a model at the international level that provides governments with the infrastructure by using the private sector's resources to increase better services. A powerful PPP assigns tasks, commitments, and risks to both public and private partners desirably and optimally. The main advantage of PPP is, that it provides a platform for government officials to maintain more value for money, which means better economic services in a long term. Public-Private Partnership projects provide significant opportunities for developing countries to achieve the goal of sustainable economic development. The three main requirements for the government to enter the PPP are (Cuttaree & Mandri-Perrott, 2011):

1- Impact of private investment capital (often to complete public resources);
2- Increase productivity and use existing resources effectively;
3- Creating motivation and responsibility.

PPPs (implies long-term legally binding understandings for the delivery of infrastructure or the provision of services in which the private sector acknowledges the reasonable risk and administrative duty) can play a vital duty in eliminating the infrastructure gap (lack of infrastructure) and services but the preparation and management of public-private partnerships can be complex. To identify appropriate plans for public-private partnerships, it is important to provide them transparently and efficiently (World Bank Report, 2018). Therefore, restricted government resources and recent changes in the economy have prompted government agencies to employ private sector capacity in all infrastructures (Eskandary et al., 2019).

As mentioned, the main purpose of public-private partnership in the discussion of trade is to help facilitate and develop it. Reducing barriers by using less expensive routes (e.g., port development and border facilities) can boost trade and increase the flow of goods, services, and passengers without jeopardizing the collection of government duties and taxes at the international border, which is largely due to customs. Because the presence of the private sector under the control and supervision of the government makes this sector seek to gain more revenue and the need to respond with more transparency, and influence, and increase the overall productivity of all sectors (Campos et al., 2018).

The main purpose of PPP for trade activities and issues related to government organizations such as free zones and customs is to be able to advantage of the expertise and productivity of the private party for projects. In most countries, especially in developing countries, lots of the infrastructure and service costs are borne by the public sector, which is both costly and time-consuming, causing dissatisfaction among clients, even customers of commercial sectors. Many developing countries have good rules for PPP but they have weak performance. The participation of the private and public sectors and the use of private sector power under the direct supervision and control of the government also can increase customer satisfaction and the performance of free zones.

Therefore, according to the reports and studies carried out to pay attention to PPP and identify applicable items in free zones as well as other related organizations, it is very important and it opens a new window on business development and facilitation.

2.2 Literature Review

Through the interaction between financial administrators and government organizations, especially at borders, in an environment full of national and international laws and regulations, international trade is carried out. Although TF is not a relatively new issue in this regard, it has attracted the attention of governments and the international business community and pays special attention to the quality of business operations in the movement of goods across borders

(Grainger, 2014). In simpler expression, TF can be thought of as the application of strategies to reduce barriers to trade that involve even free zones with an emphasis on safeguarding the interests of governments.

In their study on public-private partnerships to facilitate trade (TF) in Brazil, Campos et al. (2018) state that trade facilitation has had a significant positive impact on international trade. Part of solving TF issues has been done through PPPs. This kind of partnership is considered one of the options to increase the effectiveness of investments and developments in facilitating business. The results show that macro-environmental and policy variables in this theory have the greatest impact on PPPs based on trade facilitation.

In evaluating and comparing the development performance of China Free Trade Zones by Chen et al. (2018), state that these areas are considered an important platform for China's economic prospects, combining innovation, technology, and privet participation considered remarkably. Huang et al. (2017) studied the Shanghai Bay Free Trade Zone and its impact on its economic growth as a suitable place to attract domestic and foreign investment and acknowledged that since free zones offer policies that also facilitate business and trade, the development of PPP will lead to the development of the area.

Chen et al. (2017) examine the socio-economic effects of PPP in transportation and its direct and indirect effects on trade and economic well-being in infrastructure and confirm its positive effects on trade. PPPs to assist in the sustainable development of infrastructure were assessed by Chisa et al. (2015) in the port city of Lagos, Nigeria, its development was approved to facilitate and increase trade. As Osei-Kyei & Chan (2015) showed, information transparency, risk sharing, political support, access to private sector knowledge and technology, and public support are key to the success of PPP.

In line with the role of infrastructure development in facilitating trade and thus economic growth, Lick and Hamlin (2012), while reviewing several commercial transportation projects in Canada, Mexico, and the United States, stated that the benefits of The use of PPP include innovation in the private sector, faster project delivery, increased investment, and reasonable project costs and for PPP to be useful into the development of commercial infrastructure, there must be clear rules and ongoing oversight and that political currents must not undermine the government's commitment.

Considering that partnerships are not only for infrastructure, there is a special type of PPP that can lead to services, and the main focus of this research is on free zone partnerships and business actors as a kind of relationship. It is created between the government and the private agency to reduce the cost of trade so as not to undermine the safety standards determined by the free zones. In this sense, it can be considered a special type of PPP that facilitates trade.

2.3 Variables

According to previous studies, the definition and structure of PPP, the laws of free zones in Iran, and the importance of trade facilitation, which includes the

three important concepts of simplification, standardization, and harmonization of trade procedures, variables have been extracted, and defined:

Private Sector Abilities (PSA): The private sector can often bring useful management skills, technology, and resources to the world by using up-to-date knowledge and technology to participate. The sector is more dynamic, resilient, creative, innovative, and vibrant than the public one which is measured by advanced technologies, leadership skills, and commitment (Chisa et al., 2015).

Advanced Technologies (AT): Technology in PPP arrangements is compatible with technical solutions and benefits from advanced technology are appropriate project inputs (Cuttaree & Mandri- Perrott, 2011).

Leadership Skills (LS): Project management skill is the ability to apply relevant knowledge, methods, and techniques and knows the relevant specialized field (Demirag et al., 2011).

Commitment (Com): Commitment to the principles of the PPP contract in such a way that the objectives of the project are not disturbed is recognized as a primary principle in all PPPs (Lick & Hamlin, 2012).

Project's Qualities (PQ): The dimensions of the contract, the guarantees obtained, how to supervise the project and the knowledge and experience of the private sector regarding the project in question are factors that affect the quality of the projects and play a role in its efficiency which is measured by contract, pre-implementation studies and operational skills (Campos et al., 2018):

Contract (Con): Contract preparation is the first step towards success in the long-term commitment of a PPP project. After the signing of the PPP contract and financial closure, the project implementation will begin. Establishing a proper PPP contract management system is very important to monitor the implementation of the PPP contract (world bank, 2018).

Pre-Implementation Studies (Pre-IS): The correct and accurate definition of the project in all its dimensions provides the basis for a detailed review of the plan and participation in the project. Conducting pre-implementation studies makes the private sector aware of its legal duties and obligations (Nyamdorj, 2007).

Operational Skills (OS): Executive work history and its technical evaluation determine the operational skills of the private sector (Cuttaree & Mandri- Perrott, 2011).

The Macro-Environment Factors (Mac-EF): The macro-environment Factors are concerned with the duties of government. The government may have to provide more guarantees to support infrastructure investment and some developer risks. The government should use PPP contract monitoring and modification mechanisms to minimize enforcement risk. The government should ensure that it does not withdraw additional support for PPP or receive excessive benefits in the future which is measured by government social and supportive commitments and government monitoring (Cuttaree & Mandri- Perrott, 2011).

Government Social and Supportive Commitments (GSSC): Considering the nature of PPP projects, which mainly have social benefits, the government should

also play a supportive role and use competent experts when disputes arise (Nyamdorj, 2007).

Government Monitoring (GM): PPPs increase the government's ability to transfer operational roles to specialized private sector operators while having the necessary control and supervision, and the proper implementation of this approach should save government costs, and provide better and cheaper services. bring more benefits for the consumer and employment and profitability for the investor, and the result is that the effective implementation of the obligations of the parties is seen (Felsinger, 2005).

The Micro-Environment Factors (Mic-EF): The micro-environment factors are the coordination of the private sector for businesses to interact with the TF culture. Thus, private sector creativities such as workshops, meetings, and other events that promote TF programs can influence the effectiveness of these programs. In addition, the budgetary capacity of businesses is a vital factor that is measured by financial capacity, project duration, and return on investment (Campos et al., 2018):

Financial Capacity (FC): PPPs can significantly reduce the financial burden of the public sector by introducing private financial resources and capability. It is expected that replacing private funds instead of public financial resources in the infrastructure investment process and using the financial power of this sector will reduce the financial burden of the government (Chen et al., 2017).

Project Duration (PD): The duration of the PPP project includes design, implementation, execution, and exploitation (Jalali Naeini, 2014).

Return on Investment (RI): The private sector, which is looking for profit and return on its investment, enter PPP intending to act competitively to achieve more profit and guarantee its return on investment (Cuttaree & Mandri- Perrott, 2011).

TF Oriented PPPs (TFO-PPPs): One type of relationship created between public and private initiatives to reduce transaction costs and the need for permanent cooperation in the process of moving goods across borders is TF Oriented PPPs, which does not reduce the security standards set by the customs. From this point of view, it can be considered a special type of PPP, which according to the previous studies and the definition include increased productivity, effective use of available resources, financial and operating gain, public and private sector accountability, and indirect competitive advantage (Campos et al., (2018); Gaeta & Etemadmoghaddam, (2020)).

Trade Facilitation (TF): Trade Facilitation means complying with national regulations to promote legitimate trade while maintaining the integrity and security of national borders and national income, as well as the safety of goods, emphasizing adherence to international, regional, and bilateral commitments and sustainable economic development. Based on the definition of trade facilitation, three main dimensions include simplification of customs procedures, standardization and growth of infrastructure, and harmonization of laws and regulations (UNCTAD, 2009; WCO, 2011; Moïsé, 2013).

The variables obtained from previous studies are summarized as follows in Table 1.

Table 1. Research variables

Name	Type	Background research
Private Sector Abilities	In depended variable	Felsinger, 2005, Nyamdorj, 2007, Lick & Hamlin, 2012, Demirag et al., 2011, Cuttaree & Mandri-Perrott, 2011, Jalali Naeini, 2014, Chisa et al., 2015, Osei-Kyei & Chan, 2015, Campos et al., 2018, world bank 2018, Eskandary et al., 2019, Gaeta & Etemadmoghaddam, 2020.
Project's Qualities		Felsinger, 2005, Nyamdorj, 2007, Cuttaree & Mandri- Perrott, 2011, Jalali Naeini, 2014, Chisa et al., 2015, Campos et al., 2018, world bank, 2018, Gaeta & Etemadmoghaddam, 2020, Yakubu & Muhammed, 2020.
The Macro-Environment Factors		Felsinger, 2005, Nyamdorj, 2007, Cuttaree & Mandri- Perrott, 2011, Campos et al., 2018, Gaeta & Etemadmoghaddam, 2020.
The Micro-Environment Factors		Felsinger, 2005, Nyamdorj, 2007, Cuttaree & Mandri- Perrott, 2011, Jalali Naeini, 2014, Campos et al., 2018, Gaeta & Etemadmoghaddam, 2020.
TF Oriented PPPs	Moderator variable	Felsinger, 2005, Nyamdorj, 2007, Lick & Hamlin, 2012, Demirag et al., 2011, Cuttaree & Mandri-Perrott, 2011, Jalali Naeini, 2014, Chisa et al., 2015, Osei-Kyei & Chan, 2015, Chen et al., 2017, Campos et al., 2018, world bank, 2018, Eskandary et al., 2019, Gaeta & Etemadmoghaddam, 2020.
Trade Facilitation	Depended variable	Felsinger, 2005, Cuttaree & Mandri- Perrott, 2011, Demirag et al., 2011, Osei-Kyei & Chan, 2015, Chisa et al., 2015, Campos et al., 2018. UNCTAD, 2009, WCO, 2011, Moïsé, 2013, Campos et al., 2018, Gaeta & Etemadmoghaddam, 2020.

Source: *Literature review*

2.4 Conceptual Model

Taking a good look at the concept of TF from the perspective of PPP theory, the first fundamental and logical step in this field is to find the key success factors in the proper functioning of PPP.

Such factors are recognized throughout the literature as success factors and have been mentioned in several articles. In a review of previous studies on public-private partnerships (with special emphasis on the work of Osei-Kyei and Chan (2015) and Campos et al. (2018), several success factors were found that show that PPP has also played a role in the trends of countries' trade.

Focusing on expert groups from the public and private sectors, the result was the presentation of a design that linked the constructs based on success factors (SF) to the perceived/expected performance of a TF-based PPP and a

questionnaire. The questions were divided into six major groups representing the constructs, then classified according to their important dimensions. Since the main purpose is to study the various factors of private and public participation in facilitating trade in Iran's free zones, which have almost the same structure according to the main purpose of forming free zones, an attempt was made to present the causal relationships of variables in research.

The main factors include trade facilitation, standardization and growth of infrastructure, simplification of customs procedures at the borders, harmonization of laws and regulations, TF-oriented PPPs, private sector abilities, project quality, macro, and micro environmental factors, and more. Since the main purpose is to study the various factors of Private-Public partnerships in Trade Facilitation in free zones of Iran, an attempt has been made to present the causal relationships of variables in the form of a research model, according to Figure 1.

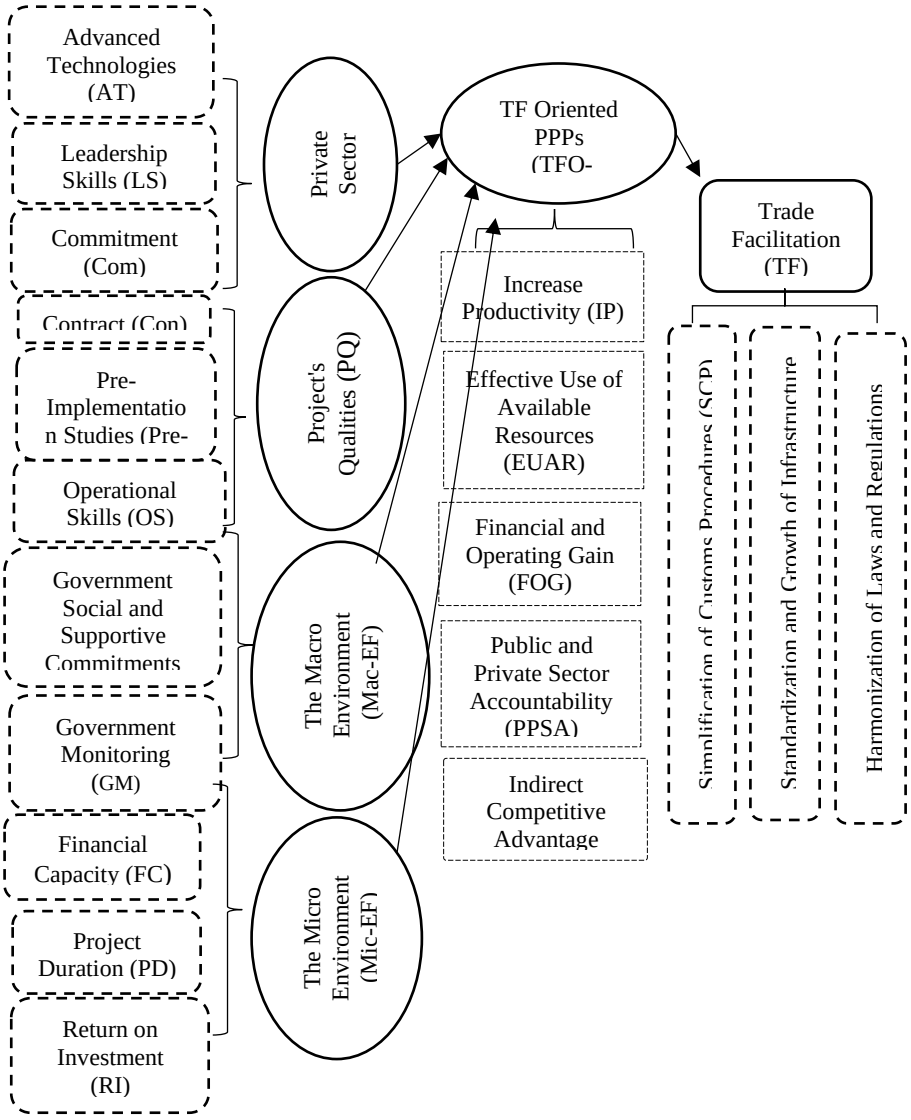

Figure 1. PPP performance model (Researcher- made)

2.5 Research Hypotheses

Hypotheses were designed according to the theory of realization. According to the theory of TF-oriented PPP, review of PPP literature, and considering the main research objective, the first step to properly understanding what affects the performance of TF-oriented PPP was to find the main success factors of these collaborations. Such elements were recognized throughout the literature as influencing factors and the performance of TF-oriented PPPs was investigated

with private sector abilities, project quality, macro-environment, and micro-environment. TF-oriented PPPs were also used as a mediating variable between the independent and dependent variables of this study and were investigated for their effect on trade facilitation. Since figure 1 shows the last version of the PPP performance based on this research, Table 2 presents the study's hypotheses.

Table 2. Study's hypotheses

Hypotheses	Description
H1	Private sector abilities have influenced the performance of the TF-oriented PPPs.
H2	Project quality influences the performance of the TF-oriented PPPs.
H3	The macro-environment factors influence the performance of the TF-oriented PPPs.
H4	The micro-environment Factors influence the performance of the TF-oriented PPPs.
H5	TF Oriented PPPs influence trade facilitation.

***Note**: (Researcher -made)*

3. Methodology and Analysis

Regarding the objective, this is a practical study in which the relations between the variable of trade facilitation and PPP are examined. Based on preliminary studies conducted on the purpose, data collection was done by sending the online version of the researcher-made questionnaire with a five-point Likert scale to the statistical population, which were selected for two reasons: firstly, they had a clear understanding of PPP, TF, and FZ. Secondly, researched or worked with trade or TF in their regular duties. Therefore, to determine the sample size with the researcher's access simple random sampling was used among public-private sector and university professors all of them are engaged with their daily work in international business. This statistical population includes senior, middle, and basic managers of customs related to the free zone, managers, and officials of free zones (seven free zones of Iran); managers and officials of industrial and commercial companies that somehow work in free zones, as a private sector. Also, to enrich the statistical community, the professors of different universities in the country who had expertise in the subject of international trade, free zones, and PPP were invited to cooperate. The statistical population was estimated to be around 200 people, and based on Morgan's table, 127 questionnaires were needed as a sample. There was a very diverse sample of respondents, with 153 respondents agreeing to participate, but only 128 were valid for the final analysis, and due to incomplete data and bias, the rest of the questionnaires were ignored.

For two reasons, good and acceptable results were seen from this round of validation; first, taking advantage of the opinions of various experts on some of the questions, which led to the precise design of the questionnaire, secondly, their general opinion on the questions presented was very positive. Some even mentioned that the questionnaire covers all the important things.

According to the objective, this research has observed the matter of TF-oriented PPPs by assessing their performance in free zones. Because Structural Equation Modeling (SEM) can relate latent and observed variables through the use of statistical tools, this method was used as a tool to measure performance in a quantifiable way (Campos et al., 2018).

The reliability of the questionnaire was calculated using Cronbach's alpha coefficient. The set minimum threshold for establishing reliability with Cronbach's alpha is ≥0.60 while the set threshold for composite reliability is ≥0.70 (Zephaniah et al., 2020) and the results in Table 3 show that the questionnaire has good internal coherence and high reliability.

Table 3. Calculation of cronbach alpha

Variables	Cronbach alpha (Questionnaire reliability)
TFO-PPPs	0.900
PSA	0.812
PQ	0.758
Mac-EF	0.789
Mic-EF	0.755
IP	0.761
EUAR	0.753
FOG	0.671
PPSA	0.786
ICA	0.791
TF	0.879
SCP	0.753
SGIB	0.775
HLR	0.785

***Note**: Cronbach's alpha is ≥0.6*
***Source**: Research results*

To determine the validity of these tools, divergent and convergent validity were submitted to the Structural Equation Modeling test and PLS software, the results of which are presented.

3.1 Assessing Conceptual Model

Model analysis algorithm in the PLS-SEM method has been used to test the conceptual model of the research, Structural Equation Models (SEM) (Bollen 1989; Kaplan 2000) include several statistical methods to estimate a network of causal relationships. Based on a theoretical model, SEM is defined and this model links two or more latent complex concepts, and each concept is measured via some observable indicators (Vinzi et al., 2010). For this purpose, the analyzes have been used in three parts: psychometrics of the measurement scale, structural model fit, and general model validation.

3.2 Psychometrics of the Measurement Scale

The general rule for convergent validity is 1) average variance extracted (AVE) > 0.5 and 2) loading factor > 0.7, which in exploratory research, loading factor 0.6-0.7 is still acceptable (Latan & Ghozali, 2012).

3.2.1 Average Variance Extracted

Additionally, convergent validity and divergent validity are for determining construct validity (Hair et al., 2016). According to Moliner et al. (2007), convergent validity is met if the factor loadings exceed 0.5. The correlation of a structure in the divergent narrative part is compared with its indicators against the correlation of that structure with other structures. If the square root of AVEs is greater than each pair of correlations among latent variables, divergent validity will be established (Davari & Rezazadeh, 2014). In addition, if the loading of measurement items on their primary variable is higher than the loading of these items on other variables, divergent validity is created. (Zephaniah et al., 2020).

Table 4. AVE- Average variance extracted

Variables	AVE	Variables	AVE
TFO-PPPs	0.552	FOG	0.511
PSA	0.840	PPSA	0.511
PQ	0.596	ICA	0.618
Mac-EF	0.659	TF	0.579
Mic-EF	0.667	SCP	0.577
IP	0.582	SGIB	0.528
EUAR	0.575	HLR	0.617

***Note**: AVE≥0.5*
***Source**: Research results*

Also, Table 5 shows that the measurement of AVE demonstrates excellent internal consistency across their theoretical constructs because AVE well exceeded the minimum limits of acceptability (≥0.5).

Table 5. Comparison of the matrix of AVE square root with construct's correlation coefficients (divergent validity)

Cons.	TFO-PPPs	SGIB	EUAR	IP	TF	SCP	FOG	Mic-EF	Mac-EF	PSA	PPSA	ICA	HLR	PQ
TFO-PPPs	0.856													
SGIB	0.767	0.893												

Table 5 (Continued). Comparison of the matrix of AVE square root with construct's correlation coefficients (divergent validity)

	EUAR	IP	TF	SCP	FOG	Mic-EF	Mac-EF	PSA	PPSA	ICA	HLR	PQ
EUAR	0.795	0.593	0.789	0.595	0.710	0.560	0.367	0.302	0.789	0.809	0.580	0.456
IP	0.677	0.715	0.727	0.657	0.440	0.343	0.354	0.226	0.553	0.617	0.607	0.339
TF	0.759	0.669	0.705	0.560	0.416	0.396	0.173	0.168	0.515	0.510	0.564	0.279
SCP		0.763	0.705	0.509	0.498	0.450	0.323	0.182	0.598	0.582	0.567	0.348
FOG			0.842	0.616	0.435	0.355	0.205	0.231	0.606	0.640	0.828	0.329
Mic-EF				0.708	0.289	0.219	0.116	0.176	0.541	0.480	0.521	0.176
Mac-EF					0.715	0.530	0.347	0.255	0.502	0.508	0.372	0.361
PSA						0.816	0.284	0.364	0.388	0.477	0.334	0.572
PPSA							0.812	0.285	0.340	0.295	0.033	0.484
ICA								0.812	0.140	0.395	0.182	0.462
HLR									0.715	0.556	0.454	0.411
PQ										0.786	0.533	0.419
											0.731	0.315
												0.772

***Note**: AVE≥0.5*
***Source**: Research results*

As can be seen from Table 4 taken from the method of Fornell and Larcker (1981), all the square roots of the AVEs were uniformly well above the highest

correlation pair amongst the latent variables. That is, the value of the AVE root located in the main diameter of the matrix is greater than the value of the correlation between them in the lower and left cells of the main diameter (Hair et al., 2016). This is an indication that shows the measurement scales demonstrate convergent validity and confirmed the validity of the questions.

3.2.2 Factor Loading

If this value is equal to or less than 0.6, those indices should be corrected or removed from the research model (Davari & Rezazadeh, 2014).

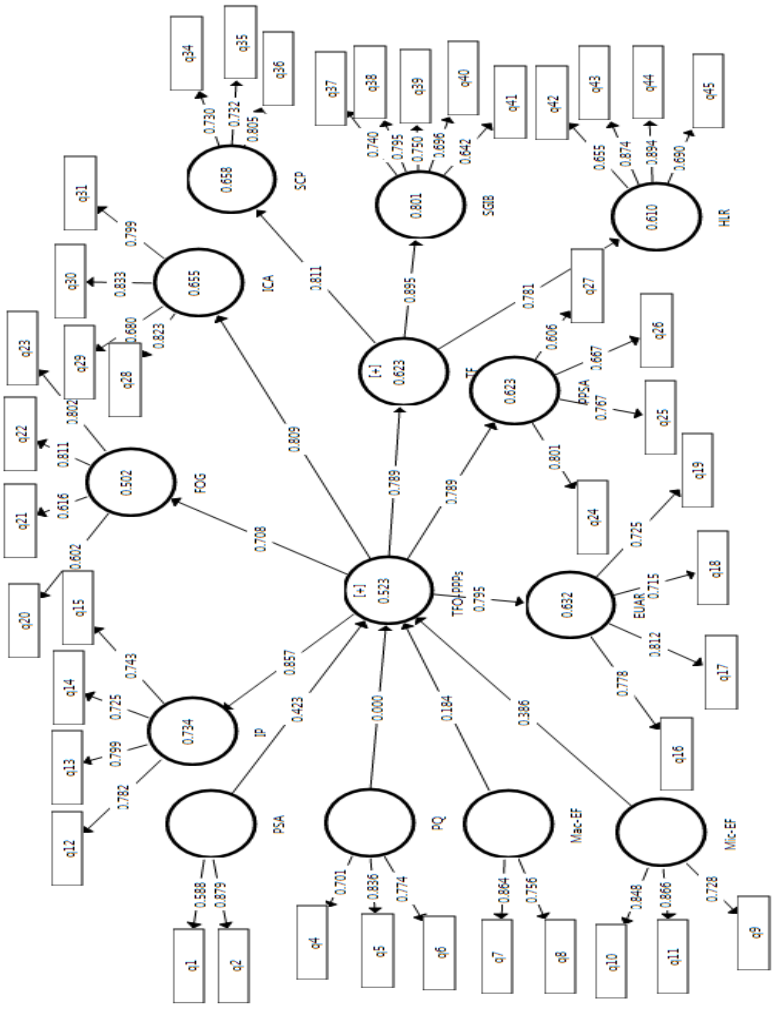

Figure 2. Structural Equations Modeling in the standard state of research hypotheses
Source: *PLS (SEM-PLS)*

Table 6. Factor load values of independent variable questions (Measurement models)

Variables		Question	Factor Loading
Private Sector Abilities (PSA)	Q1	The effect of AT on PSA	0.588
	Q2	The effect of LS on PSA	0.879
	Q3	The effect of Com on PSA	0.321
Project's Qualities (PQ)	Q4	The effect of Con f on PQ	0.701
	Q5	The effect of Pre-IS on PQ	0.836
	Q6	The effect of OS on PQ	0.774
Macro-EF	Q7	The effect of GSSC on Macro-EF	0.864
	Q8	The effect of GM on Macro-EF	0.756
Micro- EF	Q9	The effect of FC on Micro-EF	0.728
	Q10	The effect of PD on Micro-EF	0.848
	Q11	The effect of RI on Micro-EF	0.866
Increase Productivity (IP)	Q12	The effect of PSA on IP	0.782
	Q13	The effect of PQ on IP	0.799
	Q14	The effect of Macro-EF on IP	0.725
	Q15	The effect of Micro-EF on IP	0.743
Effective Use of Available Resources (EUAR)	Q16	The effect of PSA on EUAR	0.778
	Q17	The effect of PQ on EUAR	0.812
	Q18	The effect of Macro-EF on EUAR	0.715
	Q19	The effect of Micro-EF on EUAR	0.725
Financial and Operating Gain (FOG)	Q20	The effect of PSA on FOG	0.622
	Q21	The effect of PQ on FOG	0.616
	Q22	The effect of Macro-EF on FOG	0.811
	Q23	The effect of Micro-EF on FOG	0.802
Public and Private Sector Accountability (PPSA)	Q24	The effect of PSA on PPSA	0.801
	Q25	The effect of PQ on PPSA	0.767
	Q26	The effect of Macro-EF on FOG	0.667
	Q27	The effect of Micro-EF on FOG	0.606
Indirect Competitive Advantage (ICA)	Q28	The effect of PSA on ICA	0.823
	Q29	The effect of PQ on ICA	0.680
	Q30	The effect of Macro-EF on FOG	0.833
	Q31	The effect of Micro-EF on FOG	0.799
Simplification of Customs Procedures (SCP)	Q32	The effect of IP on SCP	0.368
	Q33	The effect of EUAR on SCP	0.289
	Q34	The effect of FOG on SCP	0.730
	Q35	The effect of PPSA on SCP	0.732
	Q36	The effect of ICA on SCP	0.805

Table 6 (Continued). Factor load values of independent variable questions (Measurement models)

Standardization and Growth of Infrastructure at the Borders (SGIB)	Q37	The effect of IP on SGIB	0.740
	Q38	The effect of EUAR on SGIB	0.795
	Q39	The effect of FOG on SGIB	0.750
	Q40	The effect of PPSA on SGIB	0.696
	Q41	The effect of ICA on SGIB	0.642
Harmonization of Laws and Regulations (HLR)	Q42	The effect of IP on HLR	0.655
	Q43	The effect of EUAR on HLR	0.874
	Q44	The effect of FOG on HLR	0.894
	Q45	The effect of PPSA on HLR	0.690
	Q46	The effect of ICA on HLR	0.315

Note: Factor Loading $>$ 0.6
Source: Research results

The results according to Table 6 show that the third question of the variable of private sector abilities, the first and second questions of the variable of simplification of customs procedures, and the fifth question of the variable of Harmonization of Laws and Regulations with a factor load of less than 0.6 have been removing and the rest of the questionnaire questions are sufficiently valid. For this purpose, the analyzes have been used in three parts: psychometrics of the measurement scale, structural model fit, and general model validation.

3.3 Structural Equation Model Fit

Structural equation model fit is determined by the degree of similarity between the collective relationships specified in a given model and the methodological process by which the internal validity, external validity, adequacy, and efficacy of a structural equation model are determined (Peugh & Feldon, 2020).

1-Significance of coefficients

According to Figure 3 fitting the structural model using t-coefficients is such that the coefficients are ≥ 1.96 to be able to confirm their significance at the 95% confidence level, where all coefficients are ≥ 1.96.

Figure 3 shows that the measurement scales have excellent internal consistency in their theoretical constructs, as their coefficients well exceed the minimum acceptable limits and are known to be internally consistent (reliable).

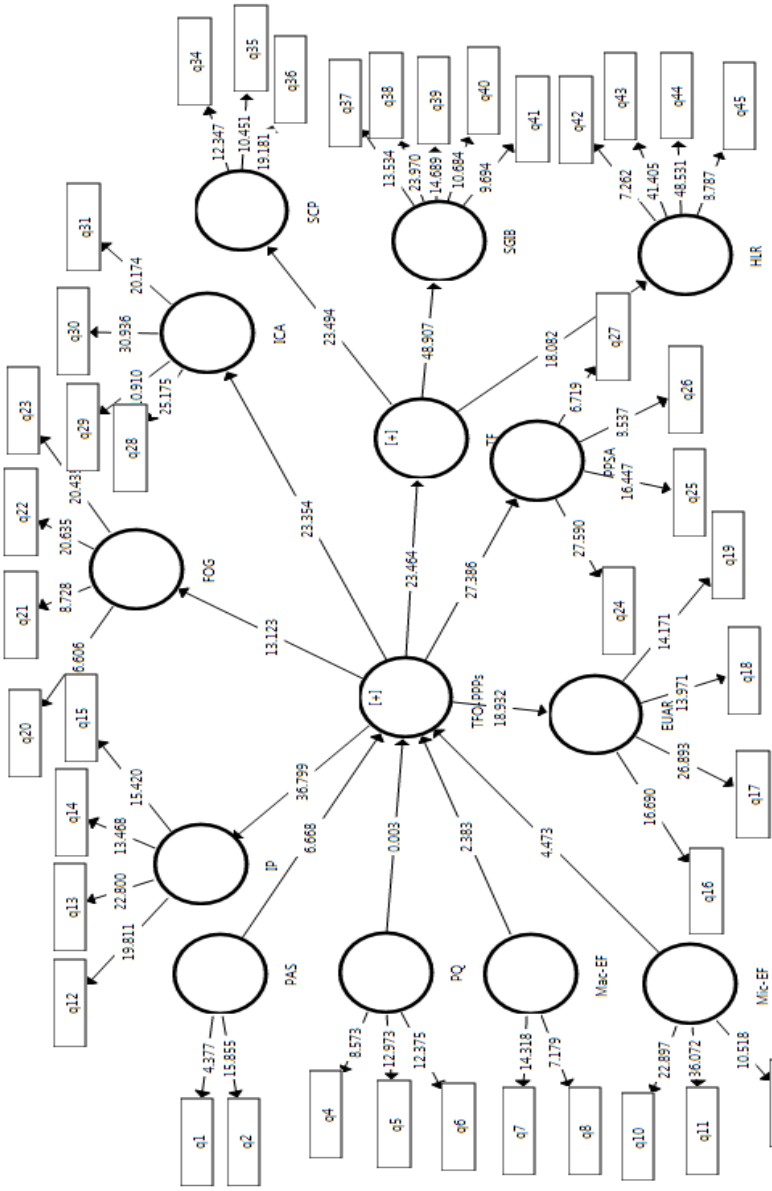

Figure 3. Fitting the structural model
***Source**: PLS(SEM-PLS)*

3.4 Coefficients of R-Square

The second determining scale for the Structural equation model fit in this research is the coefficients R-square related to the endogenous latent variables of

the model. R2 is a criterion that shows the effect of an exogenous variable on an endogenous variable and three values33.19, 0.0, and 0.67 is considered as the criterion value for weak, medium, and strong values of R-square that is shown in Figure 4.

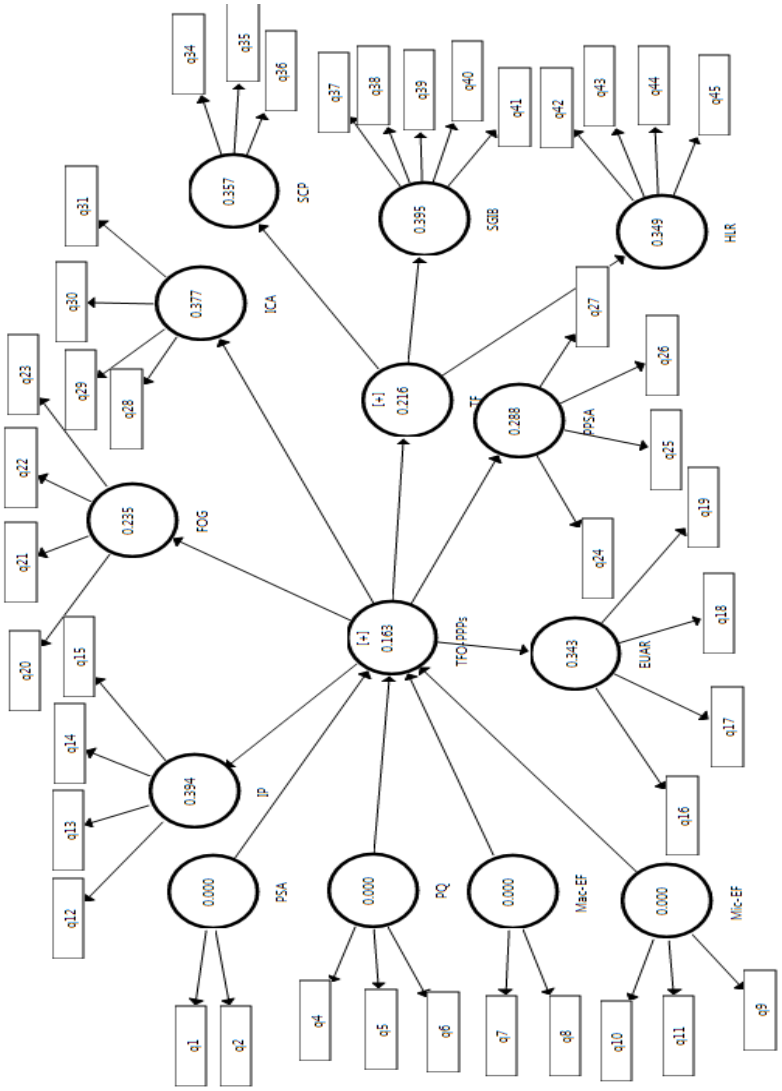

Figure 4. Coefficients of R-square
***Source**: PLS (SEM-PLS)*

The results of R2 coefficients are given in table 7 according to figure 4. The results show that the R-square of the research variables are medium to strong and they have an acceptable fit and can be considered valid (Hair et al., 2016).

Table 7. Standard R2 values

Variables	TFO-PPPs	IP	EUAR	FOG	PPSA	ICA	TF	SCP	SGIB	HIR
R2	0.163	0.394	0.342	0.236	0.289	0.376	0.216	0.375	0.395	0.349

Note: *R2 = 33.19, 0.0, and 0.67 is considered as the criterion value for weak, medium, and strong values of R2.*
Source: *Research results*

3.5 General Model Validation

According to the PLS path modeling structure, after examining the fit of the measurement section and the structure of the research model, the overall section fit should also be controlled. Although PLS path modeling lacks a well-identified global optimization criterion and there is no global goodness-of-fit function to evaluate the goodness of the model, a global goodness-of-fit measure called the "GoF index" was proposed by Vinzi et al. (2010). This index was developed to take into account the performance of the model in the measurement and structural model and thus provides a single measure of the overall predictive performance of the model. For this reason, the GoF index is obtained as the geometric mean of the average communality index and the average R2 value (Vinzi et al., 2010):

$$GOF = \sqrt{\overline{Com} \times \overline{R^2}}$$

Table 8. Commonality index and the average R2 value

Variables	commonality index	R2 value
TFO-PPPs	0.532	1.164
PSA	0.659	-
PQ	0.617	-
Mac-EF	0.667	-
Mic-EF	0.511	-
IP	0.575	0.349
EUAR	0.528	0.342
FOG	0.577	0.236
PPSA	0.840	0.289
ICA	0.511	0.376
TF	0.582	0.216
SCP	0.579	0.357
SGIB	0.552	0.395
HLR	0.618	0.349

Source: *Research results*

In this formula, R2 is the average value of the coefficients for determining the endogenous structures of the model, which is calculated to be 0.95 for the present model. Finally, the GOF of the present model was extracted equally to

0.430. According to the values in table 8, the average value of the common values is equal to 0.596. Also, since there are 5 hidden endogenous variables in this model, so the value $\overline{R^2}$is equal to: 0.311. While Wetzles et al. (2009) introduced three values of 0.01, 0.25, and 0.36 as weak, medium, and strong values for GOF (Abbaasi Esfanjani, 2016). Since the GOF value for the present model was calculated to be 0.430, it indicates a very strong fit for the overall research model.

4. Hypothesis Testing

The research hypotheses have been tested based on the data analysis algorithm in the PLS method, after analyzing the fit of the measurement models, structural and common models, by analyzing the significant coefficients of the t values of each path and the standardized coefficients of the factor loads related to the paths. If the value of each of the significant coefficients is more than 1.96, the relevant path is confirmed at the 95% confidence level and the related hypothesis is confirmed. The results of the hypothesis test are shown in Table 9.

Table 9. Hypotheses test outputs

Hypothesized relationships	Path Coefficients	t-value	Result
H1: Private sector abilities → TF-oriented PPPs	0.414	7.251	Supported
H2: Project's quality → TF-oriented PPPs	0.079	0.854	Not supported
H3: The macro-environment factors→ TF-oriented PPPs	0.185	2.597	Supported
H4: The micro-environment factors → TF-oriented PPPs	0.353	3.873	Supported
H5:TF-oriented PPPs → Trade facilitation	0.789	24.238	Supported

Sources: *Research results*

The results of five hypothetical relationships are briefly shown in Table 8. Results show that private sector abilities have a positive effect on TF-oriented PPPs (t=7.251>1.96) thus, H1 was validated. Results also indicate that the macro-environment factors (t=2.597>1.96) and the micro-environment factors (t= 3.873 >1.96) were significantly predicted by on TF oriented PPPs so H3 and H4 were validated and TF-oriented PPPs has a significant positive effect on trade facilitation (t = 24.238 >1.96). Thus, there is sufficient evidence to confirm H1, H3, H4, and H5. In contrast, the project's quality is not a significant predictor of TF-oriented PPPs (t=0.854 < 1.96 0.55), thus, H2 was rejected.

5. Discussion

This study originally set out to examine the impact of the Public-Private Partnership in the trade of Iran's seven free zones and presents a conceptual model and then achieves the research goal with the PLS-SEM approach. In this manner, this study uncovered the level of performance of PPP instruments in free zones to

develop and improve the performance of free zones and thus increase trade facilitation standards in the country and these findings are consistent with previous research.

Of the 5-hypothesis proposed by this study, four hypotheses were confirmed and one was rejected. Hypothesis H2 includes project quality, where the dimensions of contract, pre-implementation studies, and the practical experience of managing previous projects were rejected because the coefficients for this construct did not fall within the desired parameters (t = 0.854 <1.96 0.55). TF programs are designed having in mind a series of guidelines for governments and businesses. A company that wishes to be certified by a TF program and be able to contribute through PPP must take after a set of particular rules in a standard arrangement. It is not astounding to see that project quality isn't among the affirmed hypotheses, and these results are consistent with Campos et al. (2018).

Regarding the hypotheses confirmed by the statistical tool, H1, "Private Sector Abilities" showed the strongest relationship with the performance of TF-oriented PPPs (t = 7.251> 1.96). There are "Advanced Technologies", "Leadership Skills" and "Commitment" in those dimensions, and this effect in the studies of Campos et al. (2018) and Chisa et al. (2015) has also been confirmed. In this hypothesis, the Leadership Skills component with a factor of 0.879 has the greatest impact on the capabilities of the private sector. Thus, activities that advance TF programs, such as workshops, gatherings, and other occasions, can affect companies' adherence to such programs. The private sector with the desire to use its capabilities in the development and access to modern knowledge and technology, up-to-date knowledge and technology, dynamism, and flexibility, can create good effects in projects. On the other hand, the existence of highly competitive incentives in the private sector also makes this sector eager to use all its capacities and is important in TF-oriented PPPs.

The second influential structure in the performance of TF-oriented PPPs is "The macro-environment Factors" (H3: t = 2.597> 1.96), which has the dimensions of "government social and supportive committees", and "government monitoring". In this hypothesis, the government social and supportive committees' component with a factor of 0.864 has the greatest impact on this sector and shows that reasonable expectations from the public sector are important in the principled support of projects. These results can also be seen in the study of Campos et al. (2018) and Cuttaree & Mandri-Perrott (2011). Therefore, it is inferred that the development of appropriate policies based on macro goals and environmental characteristics is necessary to attract the participation of private and public partnerships.

The third powerful development to the execution of TF-oriented PPPs is "The micro-environment Factors" (H3: t = 3.873> 1.96), which includes the dimensions "financial capacity", "project duration" and "return on investment". In this hypothesis, the return on component investment with a factor of 0.866 is the factor that has the greatest impact on this sector has also been confirmed by Cuttaree & Mandri- Perrott (2011) and Chisa et al. (2015). Therefore, based on

the research findings, it is concluded that the development of a public-private partnership strategy is in line with the trajectory and atmosphere of financial issues and the investor's financial expectations. The financial ability of businesses is an imperative factor since it affects the capacity to provide the investment needed to execute a TF program.

Among the confirmed hypotheses, H5 has a very strong relationship to trade facilitation. This hypothesis includes the performance of business-oriented PPPs on the important trade-facilitating variable (t = 24.238> 1.96). This result is such as the results of Campos et al. (2018) and Chisa et al. (2015). In this hypothesis, all dimensions of trade facilitation in free zones were discussed, including the simplification of customs procedures, standardization and growth of infrastructure at the borders, and harmonization of laws and regulations. Therefore, according to the findings of this study, it is concluded that the development of the defined dimensions of trade facilitation will have a positive effect on trade facilitation in the free zones of Iran, and can realize the objectives of the research.

6. Conclusion

This article focuses on a different concept of private and public sector participation in trade and free zones. FZs are an important part of the economic development policy of countries, including Iran, and legitimate businesses enjoy the economic benefits provided by the FZ. Strengthening security and compliance with FZs is crucial while maintaining the benefits of FZs. To achieve the outstanding goals of FZs, all available facilities can be used, one of which is PPP.

The main goal of this research was to analyze the impact of TF-oriented PPP on trade facilitation in free zones according to the PPP theory. This study examined the key features of TF-oriented PPPs to determine which factors play a major role in the success of TF-oriented PPPs in Iran's free zones. In this regard, ۵hypotheses were proposed, most of them were confirmed and only one hypothesis was not accepted, and overall, this analysis seems to be strong. Therefore, according to the PPP performance model presented in this study, it is possible to consider the effective dimensions of PPP on the three dimensions of trade facilitation and implement it in free zones as well, because one of the main goals of forming free zones in Iran is the development of trade with the emphasis is on export development.

Overall, the strategy of this research is to create a basic concept that explains what factors have the greatest impact on TF-oriented PPP and trade facilitation. The reason was the nearly major understanding of the variables that had the most noteworthy effect on PPPs, to form a "compass" that might lead to further research. More research in this zone ought to center on particular truths to measure specific variances in understanding the performance of TF-oriented PPF and facilitating trade to preserve a worldwide supply chain. Results can change from territory to territory. Similarly, different sectors in a country may have different

views on an issue, and the ideal result can explain general factors affecting PPP performance.

The most important limitation of this research was the limited number of experts in the field of private-public partnership and trade, due to the novelty of the topic in Iran, which prevented the researcher from gaining more knowledge about the research topic.

It is suggested that the competent organizations in the free zones, to achieve the goals of these zones in Iran, pay special attention toon TF-oriented PPPs to reduce the cost of trade development. On the other hand, since partner organizations in free zones may have different views and rules, it is proposed to examine the dimensions of PPP in all areas related to free zones.

Author Contributions:

All authors have read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Conflicts of Interest:

The authors declare no conflict of interest.

Acknowledgements

For example: Not applicable

Reference

Abbaasi Esfanjani, H., (2016). Designing a model for commercialization of academic research by modeling methodstructural equations of partial least squares (SEM-PLS). *Quarterly Journal of Business Research*, 82, 33-65.

Campos, M. L., Morini, C., Moraes, G. H., & Inaci, E. (2018). Public- private partnership for trade facilitation: A theoretical model. *Management and Industrial Engineering*, 113-120. Dol:10.1007/978-3-319-58409-613.

Chen, J., Wan, Z., Zhang, F., Park, N. K., Zheng, A., & Zhao, J. (2018). Evalution and comparison of the development performances of typical free trade port zones in China. *Transportation Research Part A*, 118, 506-526.

Chen, Z., Daito, N., & Gifford, J. (2017). Socioeconomic impacts of transportation public-private partnerships: A dynamic CGE assessment. *Transport Policy*, 58, 80-87.

Chisa, O. S., Kayode, V., Ikeni, N. O., & Gambo, A. A. I. (2015). Public- private partnership (PPP) as catalyst for sustainable infrastructural development (Effort of rivers, cross rivers, Oyo and Lagos State government). *International Journal of Engineering Science Invention*, 4, 53-69.

Cuttaree, V., & Mandri-Perrott, C. (2011). Public-private partnerships in Europe and Central Asia, designing crisis-resilient strategies and bankable projects. *World Bank*.

Davari, A., & Rezazadeh, A. (2014). *Structural Equation Modeling with PLSSoftware*. Tehran: Organization Jahad Daneshgahi Publication (In Persian), 1.

Demirag, I., Khadaroo, I., Stapleton, P., & Stevenson, C. (2011). Risks and the financing of PPP: Perspectives from the financiers. *The British Accounting Review*, 43(4), 294-310.

Felsinger, K. (2005). *Public- private partnership*. Handbook, Asian Development Bank.

Eskandary, M., Taghavifard, M. T., Raeesi Vanani, I., & Ghazi Noori, S. (2019). Identification and prioritization of public-private partnership indicators in Iran's water and wastewater industry via data mining algorithms. *Iranian Journal of Economic Studies*, 8(2), 375-396.

Gaeta, G., & Etemadmoghaddam, F. (2020). The role of public-private-partnership on trade facilitation: WCO and IRICA perspectives and opportunities. *World Customs Organisation Fellowship Programme 2020-2021*, 1-24.

Grainger, A. (2014). The WTO trade facilitation agreement: Consulting the private sector. *World Trade*, 48(6), 1167-1188.

Hair, J., Hult, T., Ringle, C., & Sarstedt, M. (2016). *Partial least squares structural equation modeling (PLS-SEM)*. Translated by Adel Azar & Rasoul Gholamzade, Tehran: Neghae Danesh Publication (In Persian), 1.

Huang, D., Van, V. T., Hossin, Md. E., & He, Zh. (2017). Shanghai pilot free trade zone and its effect on economic growth: A counter-factual approach. *Open Journal of Social Sciences*, 5, 73-91.

Jalali Naeini, S. G., Shahanghi, K., & Emamian, S. (2014). Presenting a financial model to resolve disputes in public-private partnership contracts using game theory. *Management Research in Iran*, 18, 3-24.

Latan, H., & Ghozali, I. (2012). Partial least square konsep, teknik dan aplikasi menggunakan program smartPLS 2.0 M3. *Semarang: Badan Penerbit Universitas Diponegoro*.

Lick, D., & Hamlin, R. E. (2012). Public-private partnerships for promotion of cross-border trade and transportation. *Canada-United States Law Journal*, 37, 170-206.

Moïsé, E. (2013). The costs and challenges of implementing trade facilitation measures. *OECD Trade Policy Pap*, 157, 1-18.

Moliner, M. A., Sánchez, J., Rodríguez, R. M., & Callarisa, L. (2007). Relationship quality with a travel agency: The influence of the post purchase perceived value of a tourism package, Tour. *Hospitality Res*, *https://www.jstor.org/stable*, 7, 194-211.

Nyamdorj, G. (2007). Public-private partnerships in mongolian electronic government, Ganbold Nyamdorj ICTA, Sukhbaatar Sqr-1, Chingeltei District, Ulaanbaatar, Mongolia, Copyright (2007). *ACM 978-1-59593-822*, 10-13.

Osei-Kyei, R., & Chan, A. P. C. (2015). Review of studies on the critical success factors for public-private partnership (PPP) projects from 1990 to 2013. *Int J Project Manage*, 33(6), 1335-1346.

Peugh, J., & Feldon, D. F. (2020). How well does your structural equation model fit your data? Is marcoulides and Yuan's equivalence test the answer? *Life Sciences Education*, 19(es5), 1-8.

United Nations Conference on Trade and Development. (2009). *Handbook TD/B/C. I/MEM.1/*5. Public and Private Partnerships for the Development of Infrastructure to Facilitate Trade and Transport.

Vinzi, E. V., Trinchera, L., & Amato, S. (2010). *Handbook of partial least squares*. PLS Path Modeling: From Foundations to Recent Developments and Open Issues for Model Assessment and Improvement, 47-89.

Wetzels, R. G. W., Raaijmakers, J., Jakab, E., & Wagenmakers, E. (2009). *Psychonomic Bulletin & Review*, 16(4), 752-760. doi:10.3758/PBR.16.4.752.

World Bank Group. (2018). *Handbook, Benchmarking Public-Private Partnerships Procurement*. Benchmarking PPP Procurement: Assessing Government Capability to Prepare, Procure and Manage PPPs.

Word Customs Organization. (2011). Trade facilitation; instruments, approaches, trends, initiatives and more. *WCO news*, 65.

Yakubu, A. T., & Muhammed, I. A. (2020). The role of fiscal transparency in road transport infrastructure quality in sub-saharan Africa. *Iranian Journal of Economic Studies*, 9(2), 395-411.

Zephaniah, C. O., Ogba, I. E., & Izogo, E. (2020). Examining the effect of customers' perception of bank marketing communication on customer. loyalty, *Scientific African*, 8, 1-8.