Developing a model for Iran about the relationship between economic freedom indices and public private partnerships

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Accepted 9 February, 2011

In recent decades, simultaneously with increasing needs for more infrastructures in the developing countries, the public private partnership (PPP) model has attracted attention as a way to attract capital to sectors, while also promoting better budgetary management and transparency in public finances. This article develops a PPP model for infrastructure development in Iran via panel data analysis of 20 developing countries in the world via Eviews software regarding the relationship between economic freedom indices of Heritage Foundation and Public Private Partnerships investment. However, these benefits will only be materialized when a PPP project is properly planned and managed and both the public and private sectors work together successfully. Iran’s economy might have been hit by the ongoing adjustment to lower oil revenues and moving toward privatization by selling state-owned entities and transferring infrastructures and public services to the private sector. Findings reveal that a positive relationship among “business freedom, fiscal freedom and property rights and PPPs” has been seen. On the other side, “trade freedom, government size, monetary freedom, investment freedom, financial freedom and freedom from corruption” have negative relationship with PPP investments in Iran. Thus economic freedom is a main success factor for the success of PPPs in Iran. The better economic freedom we have in Iran, the better conditions we will have for the implementation of PPPs.

Key words: Public private partnership (PPP), infrastructures, developing countries, economic freedom, panel data.

INTRODUCTION

The model public private partnership (PPP) has been a well established methodology and a paradigm shift in new public management for procuring public infrastructures through the private sector’s expertise, efficiency, innovation, business sense, risk sharing, financing etc in recent three decades history (Cheung, 2009). PPP will improve and fill the infrastructure gap by incorporating public and private advantages and is a good solution for governments mainly to conquest budgetary constraints and lack of expertise and quality of service delivery.

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study the relationship between PPP investment and indices of economic freedom and explores which of the assessed economic freedom indices have influence on

Table 1. Some definitions of PPPs.

<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM Treasury</td>
<td>An arrangement between two or more entities that enables them to work cooperatively towards shared or compatible objectives and in which there is some degree of shared authority and responsibility, joint investment of resources, shared risk taking, and mutual benefit.</td>
</tr>
<tr>
<td>The World Bank</td>
<td>The term “public-private partnerships” has taken on a very broad meaning. The key elements, however, are the existence of a “partnership” style approach to the provision of infrastructure as opposed to an arm’s-length “supplier” relationship...either each party takes responsibilities for an element of the total enterprise and they work together, or both parties take joint responsibility for each element...A PPP involves a sharing of risk, responsibility, and reward, and it is undertaken in those circumstances when there is a value-for-money benefit to the taxpayers.</td>
</tr>
<tr>
<td>European Commission</td>
<td>A partnership is an arrangement between two or more parties who have agreed to work cooperatively toward shared and/or compatible objectives and in which there is shared authority and responsibility; joint investment of resources; shared liability or risk-taking; and ideally mutual benefits.</td>
</tr>
<tr>
<td>Canadian Council for</td>
<td>PPP is a cooperative venture between the public and private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks, and rewards.</td>
</tr>
<tr>
<td>Public Private Partnerships</td>
<td></td>
</tr>
</tbody>
</table>

PPP investment and should be focused by countries (Alam, 2009). The study also considers the existing literature of public private partnership (PPP) and extends the existing literature by analyzing the relationship between PPP investment and economic freedom indices by using panel data models over the period 1995 to 2008.

PUBLIC PRIVATE PARTNERSHIP - THE CONCEPT

The expression public-private partnership is a widely used concept world over. The PPP is defined as “the transfer to the private sector of investment projects that traditionally have been executed or financed by the public sector” (IMF, 2004). Any arrangement made between a state authority and a private partner to perform functions within the mandate of the state authority and involving different combinations of design, construction, operations and finance is termed as PPP model or private finance initiative (PFI), where the public sector purchases services from the private sector under long-term contracts is called PPP program (World Bank, 2006; Alam et al., 2010). Table 1 goes through some definitions of PPP from different international institutions:

PPP is sometimes referred to as a joint venture in which a government service or private business venture is funded and operated through a partnership of government and one or more private sector companies. Typically, a private sector consortium forms a special company called a special purpose vehicle (SPV) to build and maintain the asset (Wikipedia, 2010). The consortium is usually set up with a contractor, a maintenance company and a lender. It is the SPV that signs the contract with the government and with subcontractors to build the facility and then maintains it (Wikipedia, 2010) (Figure 1).

In this contracting structure the consortium will have a long term PPP contract with the public sector body of 20 to 30 years in length (sometimes referred to as a “concession”). The successful consortium will set up a company, known as a “special purpose vehicle” (SPV) to be contracting entity. The SPV will then enter into subcontracts and pass through the risks and responsibilities for providing various aspects of the services to subcontractors (Gbrconsulting, 2010).

The structure of a PPP project has been designed to encourage an integrated approach to the design, construction, financing and operations so that issues maintainability, durability and operability are addressed at the outset of projects. The PPP contract may require periodic “benchmarking” or even “market testing” of aspects or the services being provided, such as facilities management. Thus, the PPP combines the development of private sector capital and sometimes, public sector capital to improve public services or the management of public sector assets (Gerrard, 2001). PPP may encompass the whole spectrum of approaches from private participation through the contracting out of services and revenue sharing partnership arrangement to pure non-recourse project finance, while sometimes it may include only a narrow range of project type. PPP has two
important characteristics. Firstly, there is an emphasis on service provision as well as investment by the private sector. Secondly, significant risk is transferred from the Government to the private sector (Alam et al., 2010). The PPP model is very flexible and discernible in variety of forms (Lakshmanan, 2008). The various models/schemes and modalities to implement the PPP are set out in Table 2. Developing countries have developed a relatively stable mixed economy since independence but as before independence the public sector occupies a large part of economy (Alam, 2009). The limitations on government's ability to fund goes to the size of the projects. High savings rates but through lack of relevant intermediary skills, limited ability to assess and package the risk so as to include institutional investors into the project finance and private equity opportunities at the appropriate risk profile are anomalous.

**Figure 1.** Typical contracting structure for a PPP project. Source: JBR Hellas, Available via the Internet: http://www.gbrconsulting.gr.

**Table 2.** Schemes and modalities of PPP.

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Modalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build-own-operate (BOO)</td>
<td>The private sector designs, builds, owns, develops, operates and manages an asset with no obligation to transfer ownership to the government. These are variants of design-build-finance-operate (DBFO) schemes.</td>
</tr>
<tr>
<td>Build-develop-operate (BDO)</td>
<td></td>
</tr>
<tr>
<td>Design-construct-manage-finance (DCMF)</td>
<td></td>
</tr>
<tr>
<td>Buy-build-operate (BBO)</td>
<td>The private sector buys or leases an existing asset from the Government, renovates, modernizes, and/or expands it, and then operates the asset, again with no obligation to transfer ownership back to the Government.</td>
</tr>
<tr>
<td>Lease-develop-operate (LDO)</td>
<td></td>
</tr>
<tr>
<td>Wrap-around addition (WAA)</td>
<td></td>
</tr>
<tr>
<td>Build-operate-transfer (BOT)</td>
<td>The private sector designs and builds an asset, operates it, and then transfers it to the Government when the operating contract ends, or at some other pre-specified time. The private partner may subsequently rent or lease the asset from the Government.</td>
</tr>
<tr>
<td>Build-own-operate-transfer (BOOT)</td>
<td></td>
</tr>
<tr>
<td>Build-rent-own-transfer (BROT)</td>
<td></td>
</tr>
<tr>
<td>Build-lease-operate-transfer (BLOT)</td>
<td></td>
</tr>
<tr>
<td>Build-transfer-operate (BTO)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Public Private Partnership, Fiscal Affairs Department of the IMF.
Public-private partnerships are unavoidable and certainly are very desirable in creating solutions for funding the large public sector assets. Project finance in developing countries can be greatly enhanced by the credentials of both the public and the private partners without going to the full privatization model (Galloway, 2009). PPP’s provide a strong platform for equity, including opportunities for empowerment and we think these two elements go hand in hand (Galloway, 2009).

GDP, budget deficit, economic freedom, last experiences in PPPs are some determinants of PPPs in developing countries (Hammami et al., 2006). The researches in Iran show some strong relationship between these items and success of PPPs in Iran (Ahmadi et al., 2010). Also PPPs seem as a good solution of financing and implementation of infrastructural projects in developing countries like Iran without financial pressure on public sector and by more usage of private sector experts (Ahmadi et al., 2010).

Public and private sectors will be faced with some risks in PPPs and these risks should be defined and allocated to the parties best able to manage it (Ahmadi et al., 2010).

ECONOMIC FREEDOM – THE CONCEPT

A comprehensive definition of economic freedom should “encompass all liberties and rights of production, distribution, or consumption of goods and services. The highest form of economic freedom should provide an absolute right of property ownership; fully realized freedoms of movement for labor, capital, and goods; and an absolute absence of coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself." In other words, individuals in an economically free society would be free and entitled to work, produce, consume, and invest in any way they choose under the rule of law, with their freedom at once both protected and respected by the state. (Miller and Kim, 2009)

The Index of Economic Freedom is a series of 10 economic measurements created by The Heritage Foundation and The Wall Street Journal. Its stated objective is to measure the degree of economic freedom in the world’s nations.

The Heritage Foundation and the Wall Street Journal created the Index of Economic Freedom in 1995. According to Heritage, the creators of the Index took an approach similar to Adam Smith’s The Wealth of Nations that “basic institutions that protect the liberty of individuals to pursue their own economic interests result in greater prosperity for the larger society.”

The following is the Index’s 2008 definition of economic freedom;

The highest form of economic freedom provides an absolute right of property ownership, fully realized economic freedom using statistics from organizations like the World Bank, the IMF and the Economist Intelligence Unit including “business freedom, trade freedom, monetary freedom, government size, fiscal freedom, property rights, investment freedom, financial freedom, freedom from corruption and labor freedom (recently defined)".

The 10 factors are averaged equally into a total score. Each one of the 10 freedoms is graded using a scale from 0 to 100, where 100 represents the maximum freedom. A score of 100 signifies an economic environment or set of policies that is most conducive to economic freedom. The methodology has shifted and changed as new data and measurements have become available, especially in the area of labor freedom, which was given its own indicator spot in 2007.

Since “economic freedom” has so many degrees of importance in private participation in the infrastructure, in this article the relationships among the countries’ score in the above said indices (except labor freedom) and PPPs have been examined (Alam et al., 2009).

IRAN

Iran officially the Islamic Republic of Iran is a country in Central Eurasia and Western Asia. The 18th largest country in the world in terms of area at 1,648,195 km², Iran has a population of over 74 million. Iran is a regional power, and holds an important position in international energy security and world economy as a result of its large reserves of petroleum and natural gas. The economy of Iran is the sixteenth largest economy in the world by purchasing power parity (PPP). Iran's economy is a mixture of central planning, state ownership of oil and other large enterprises, village agriculture, and small-scale private trading and service ventures. Its economic infrastructure has been improving steadily over the past two decades but continues to be affected by inflation and unemployment. In the early 21st century the service sector contributed the largest percentage of the GDP, followed by industry (mining and manufacturing) and agriculture. In 2006, about 45% of the government's budget came from oil and natural gas revenues, and 31% came from taxes and fees. In 2008, Iran's official annual growth rate was 6%. Because of these figures and the country’s diversified but small industrial base, the United Nations classifies Iran's economy as semi-developed (1998). Iranian budget deficits have been a chronic problem, mostly due to large-scale state subsidies, that include foodstuffs and especially gasoline, totaling more than $84 billion in 2008 for the energy sector alone. In 2010, the economic reform plan was approved by parliament to cut...
problems to be overcome, such as the lagging corruption in the public sector and lack of competitiveness. Iran ranks 69th out of 139 in Global Competitiveness Report (Wikipedia, 2010).

Public private partnership is a good method for Iran to implement infrastructure and public services through cooperation of private and public sector. Since economic freedom is one of the important factors in success of PPP in the developing countries, this study has tried to assess the relationship between economic freedom indexes and PPP investment and reach a model for Iran via panel data.

LITERATURE REVIEW

The theoretical underpinning of the concept of the public-private partnership can be traced to the theory of x-efficiency developed by Leibenstein (1966). His idea was that public institutions or enterprises cannot fail as long as official financial and monetary policies are expansionary enough to bail them out or to limit their probability of failure. Inefficiencies in public institutions or enterprises result from both distortionary government interventions as well as states’ organizational structures, which are typically highly bureaucratic. Hence, according to this theory, public-private partnerships are necessary to reduce the sources of x-efficiency in public organizations and to allow them to respond to market forces and become more competitive. These inefficiencies of public organizations led in the early 1980s to the emergence of the so-called New Public Management in the United Kingdom and in others countries, mostly ones with Anglo-Saxon traditions (Hammami et al., 2006).

A standard argument for attracting private investment is to establish stable macroeconomic conditions, adequate tariff regimes, a track record of honoring commitments, and reasonable economic policies. Governments that manage to strike the right balance—as reflected, for instance, in sovereign debt ratings given by various rating agencies—are better able to attract private investors and efficient infrastructure service providers. As country ratings and macroeconomic conditions improve, governments are able to attract better providers and more financing (Dailami and Klein, 1997).

Table 2 goes through some researches regarding critical success factors and determinants of PPPs. The literature on public private partnerships (PPPs) has become a notable increasing way of doing infrastructures especially in emerging markets and have opened an important place in the public finance and economics literature in recent decades. Arrangements in PPP are considered vital for the design and implementation of any infrastructure projects. Given the determinations and important factors affecting PPPs (Hammami et al., 2006), a number of recent theoretical studies also emphasize some influencing factors. A general findings from these studies, based on 1990s and early 2000s period data, is that some factors are related to PPPs even in the private participations in PPPs and the number of PPPs implemented. A study about PPPs in Iran showed that GDP, money supply, inflation and budget deficit have effect on the investment in PPPs in Iran (Ahmadi et al., 2010).

Our emphasize in this paper is on assessing influencing economic freedom in some developing countries, rather than all countries of the world in order to reach to the model for Iran. Previous studies focused on and reported some factors regarding successful PPPs. We ask a similar but different question: What economic freedom indices are affecting PPPs in developing countries? What is the model of PPPs for Iran? In addition, finding of model for Iran would suggest the important factors in success of PPPs but also will show works should be done to make the situation better. Hence, testing whether PPPs are affected from some factors, it is also a test of the multi-country time series through a panel data analysis. Thus “panel data analysis” on PPPs reflects a stronger condition for PPP to success.

RESEARCH DESIGN

We will develop the study hypotheses, describe the main models used in this paper, clarify the operational definition of the variables used, and explain the procedures of sample selection.

The hypotheses

According to the literature and research background of this article, the following hypotheses have been issued:

H1: Countries with more “business freedom” are more likely to foster PPPs.
H2: Countries with more “property rights” are more likely to foster PPPs.
H3: Countries with more “financial freedom” are more likely to foster PPPs.
H4: Countries with more “monetary freedom”.
H5: Countries with more “fiscal freedom” are more likely to foster PPPs.
H6: Countries with more “trade freedom” are more likely to foster PPPs.
H7: Countries with more “business freedom” are more likely to foster PPPs.
H8: PPPs are more prevalent in countries with small government size.
H9: PPPs are more prevalent in countries with more “monetary freedom”.
H10: PPPs are most likely to happen in countries with more “investment freedom”.
H11: PPPs tend to be more in countries with “property rights”.
H12: PPPs are likely to be higher in countries with more “freedom of corruption”.

The methodology

As mentioned earlier, the analysis will be done by panel data technique. The panel data model is as follows:
\[ Y_{it} = \alpha_i + \beta X_{it} + \epsilon_{it} \]  

(1)

In this model, K explanatory variables will exist in \( X_{it} \). The differences among countries have been shown in \( \alpha_i \), which it's assumed fixed. If we assume that \( \alpha_i \) is fixed for all countries, OLS technique will be efficient and consistent estimator of \( \beta \), otherwise we should use other techniques. The null hypothesis is H0: \( \theta = 0 \) against the alternative of H1: \( \theta > 0 \) (Baltagi et al., 2003).

Data and variables

As explained earlier, panel data was used in this study. The same cross-sectional unit is surveyed over time for obtaining panel data. By combining time series of cross-sectional observations, panel data presents more information. Data used in this analysis were obtained from the databases of private participation in infrastructure\(^5\) and Heritage Foundation\(^6\). The sample comprises a total of 20 developing countries within the period of 1995 to 2008. As for the variables used in this study: dependent variable is the investment value in PPPs and independent variables are indices of economic freedom. The definitions of the variables are presented in Table 4.

The data set covers a fourteen-year period from 1995 to 2008. The full period -running from 1995 through to 2008- was examined to determine the relationship between economic freedom indices and PPP investments.

Table 5 summarizes the descriptive statistics for the explanatory variables and PPP measure for the period.

Sample

In this paper, we apply the new analysis to PPPs of 20 developing countries, which includes 1 European, 7 Asian and 12 other developing countries (Argentina, Bolivia, Brazil, Chile, Colombia, Guatemala, Honduras, India, Indonesia, Iran, Kazakhstan, Kenya, Malaysia, Mexico, Morocco, Nigeria, Peru, Philippine, Tanzania and Turkey). Our sample focuses on yearly data from 1995 through 2008.

Statistical techniques used

The general estimation models are divided into two specific models as follows:

(i) Model 1: fixed effects model: The fixed effect model treats omitted (unobservable) firm-specific variables as constant over period specific variables as invariant across companies. In the fixed effects model, the intercept in the regression model is allowed to differ among individuals in recognition of the fact that each individual, or cross sectional unit, may have some special characteristics of its own.

(ii) Model 2: random effects model: The random effects model treats both firm and period specific factors as random. By following the steps suggested by Gujarati (2003), instead of treating \( \alpha_i \) as fixed, it is assumed that it is a random variable with a mean value of 0 \( \alpha \) (no subscript it) and the intercept value for an individual firm.

However, the choice between the fixed and random effects models involves a trade-off between the degrees of freedom lost due to the dummy variable approach in the fixed effects model and the treatment of individual effects as uncorrelated with other regressors, as in the random effects formulation. Testing the orthogonality of the random effects and the regressors is thus important. The usual procedure is to use the Hausman test statistic for the difference between the fixed effects and random effects estimates, as suggested by Hsiao (2003).

The mean, median, minimum and maximum values with standard deviation of different variables in the model during the period 1995 to 2008 are presented in the Table 5.

EMPIRICAL RESULTS

A pooled combination of cross sectional and time series that incorporates fixed effect and random effect for both time and specific correlation are deployed. The techniques used are the Generalized Least Squares (GLS) for panel data regression technique of fixed effect and random effects models. Under these techniques, the value of PPP investments is regressed against the explanatory variables. The purpose of this regression is to identify the relationship between economic freedom indices and PPP investment. Thus, this study would employ a cross-sectional and time-series regression model by using panel data. The model has the following functional form:

Value of investment in PPPs = \( f \) (business freedom, trade freedom, monetary freedom, government size, fiscal freedom, property rights, investment freedom, financial freedom, freedom from corruption).

Where the value of PPP investments denote the dependent variable and others represent variables measuring the countries' various economic freedom indices relevant to the study.

To test the hypotheses, the relationship between the PPP investment and nine explanatory variables, representing economic freedom indices, were analyzed for selected period.

The relationship was analyzed by the panel data analysis. An appropriate model for this analysis, testing random versus fixed effects models, was selected in this study. To perform this comparison, the character of the individual effects is tested through the Hausman's specification test (1978). According to Hausman test, the fixed effects were found to be more appropriate for the model in selected period at the level which significance was 5% in selected period.

Thus, the relationship between PPP investments and the explanatory variables were examined by the fixed effects model in this study. The results obtained by the fixed effect models for all periods have been reported in Table 7.

The results

Table 6 reports the results of the GLS regression with fixed effects and random effects. Table 7 shows the
result of Hausman test for random-effects vs. a fixed-effects model, $\chi^2 = 18.05$, is significant at 5% level (one-tailed), indicating that the unobservable country specific effects are correlated with the explanatory variables. Thus a fixed effects model is better than a random effects model. As such, the fixed effects model is better in the estimation process than the random effects. Therefore, the discussion is based on the results of the GLS with fixed effects model.

The results show that the null of value investment in the 1st, 2nd, 3rd, 4th, 5th and 7th hypotheses were rejected and they denote rejection of the null hypothesis at the 5% significance levels. For the full sample period 1995 to 2008, the OLS estimation method about value of investment in PPPs, reject the null in 5 hypotheses

Table 3. Selected Literature on Critical success factors (CSFs) for PPP Projects.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>PPP type</th>
<th>Focused region</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmadi et al.(2010)</td>
<td>PPP</td>
<td>Iran</td>
<td>Factors like GDP, macroeconomic stability, fuel export, budget deficit, trade deficit, business climate, last experiences in developing countries and reaching a model for Iran</td>
</tr>
<tr>
<td>Hammami et al.(2006)</td>
<td>PPP</td>
<td>International</td>
<td>Factors like general government balance, total debt, Aid per capita, fuel exports, ethnic fractionalization, chief executive's party orientation, opposition parties in legislature, population, real GDP per capita, inflation, money supply, international reserves, control of corruption, composite country risk, rule of law and common law origin as determinants of PPPs in developing countries.</td>
</tr>
</tbody>
</table>
| Akintoye et al. (2003) | PFI      | UK             | (i) Factors that contribute to the achievement of best value in PFI projects are detailed risk analysis and appropriate risk allocation, drive for faster project completion, curtailment in project cost escalation, encouragement of innovation in project development, and maintenance cost being adequately accounted for.  
(ii) Factors that impede the achievement of best value in PFI projects are: high cost of the PFI procurement process, lengthy and complex negotiations, difficulty in specifying the quality of service, pricing of facility management services, potential conflicts of interests among those involved in the procurement, and the public sector clients' inability to manage consultants. |
| Jefferies et al. (2002) | BOOT     | Australia      | CSFs are identified from reflection of an Australian sports stadium project, which include: solid consortium with a wealth of expertise, considerable experience, high profile and a good reputation, an efficient approval process that assist the stakeholders in a very tight timeframe, and innovation in the financing methods of the consortium. |
| Li et al. (2005)    | PFI      | UK             | The most important CSFs, in descending order of importance, are:  
(i) A strong private consortium, appropriate risk allocation, available financial market, commitment/responsibility of public/private sectors, thorough and realistic cost/benefit assessment, technical feasibility, a well-organized public agency, and good governance.  
(ii) CSFs are classified into five principle factor groupings: effective procurement, project implementability, government guarantee, favorable economic conditions, and available financial market. |
| Qiao et al.(2001)   | BOT      | China          | Eight independent CSFs include: appropriate project identification, table political and economic situation, attractive financial package, acceptable toll/tariff levels, and reasonable risk allocation, selection of suitable subcontractors, management control, and technology transfer. |
| Zhang (2005)       | PPP      | International  | Five main CSF aspects are identified: economic viability, appropriate risk allocation via reliable contractual arrangements, sound financial package, reliable concessionaire consortium with strong technical strength, and favorable investment environment. |
regarding “business freedom, trade freedom, monetary freedom, government size, fiscal freedom and property rights”.

**The model for Iran**

The following model has been gotten for Iran:
Table 4. Definition of variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable:</strong></td>
<td>The value of investment in public private partnership or private participation in infrastructure.</td>
<td>PPP</td>
</tr>
<tr>
<td>PPP investment value</td>
<td>The value of investment in public private partnership or private participation in infrastructure.</td>
<td></td>
</tr>
<tr>
<td><strong>Independent variables:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business freedom</td>
<td>Business freedom is about an individual’s right to establish and run an enterprise without interference from the state. Burdensome and redundant regulatory rules are the most common barriers to the free conduct of entrepreneurial activities.</td>
<td>BZF</td>
</tr>
<tr>
<td>Trade freedom</td>
<td>Trade freedom reflects the openness of an economy to imports of goods and services from around the world and the ability of citizens to interact freely as buyers and sellers in the international marketplace.</td>
<td>TRD</td>
</tr>
<tr>
<td>Fiscal freedom</td>
<td>Fiscal freedom is a direct measure of the extent to which individuals and businesses are permitted by government to keep and control their income and wealth for their own benefit and use. A government can impose fiscal burdens on economic activity through taxation, but it also does so when it incurs debt that ultimately must be paid off through taxation.</td>
<td>FSF</td>
</tr>
<tr>
<td>Government size</td>
<td>The burden of excessive government is a central issue in economic freedom, both in terms of generating revenue (see fiscal freedom) and in terms of spending. Some government spending, such as providing infrastructure or funding research or even improvements in human capital, may be thought of as investments. There are public goods whose benefits accrue broadly to society in ways that markets cannot appropriately price. All government spending, however, entails an opportunity cost equal to the value of the private consumption or investment that would have occurred had the resources involved been left in the private sector.</td>
<td>GVS</td>
</tr>
<tr>
<td>Monetary freedom</td>
<td>Monetary freedom, reflected in a stable currency and market-determined prices, is to an economy what free speech is to democracy. Free people need a steady and reliable currency as a medium of exchange, unit of account, and store of value. Without monetary freedom, it is difficult to create long-term value or amass capital.</td>
<td>MNF</td>
</tr>
<tr>
<td>Investment freedom</td>
<td>A free and open investment environment provides maximum entrepreneurial opportunities and incentives for expanded economic activity, productivity increases, and job creation. The benefits of such an environment flow not only to the individual companies that take the entrepreneurial risk in expectation of greater return, but also to society as a whole.</td>
<td>INV</td>
</tr>
<tr>
<td>Financial freedom</td>
<td>A transparent and open financial system ensures fairness in access to financing and promotes entrepreneurship. An open and free banking environment encourages competition to provide the most efficient financial intermediation between households and firms and between investors and entrepreneurs.</td>
<td>FIN</td>
</tr>
<tr>
<td>Property rights</td>
<td>The ability to accumulate private property and wealth is understood to be a central motivating force for workers and investors in a market economy. The recognition of private property rights, with sufficient rule of law to protect them, is a vital feature of a fully functioning market economy. Secure property rights give citizens the confidence to undertake entrepreneurial activities, save their income, and make long-term plans because they know that their income, savings, and property (both real and intellectual) are safe from unfair expropriation or theft.</td>
<td>PRR</td>
</tr>
</tbody>
</table>
Corruption is defined as dishonesty or decay. In the context of governance, it can be defined as the failure of integrity in the system, a distortion by which individuals are able to gain personally at the expense of the whole. Political corruption manifests itself in many forms such as bribery, extortion, nepotism, cronyism, patronage, embezzlement, and, most commonly, graft, whereby public officials steal or profit illegitimately from public funds.

Table 5. Descriptive statistics of variables.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>BZF</td>
<td>61.88780</td>
<td>55.00000</td>
<td>85.00000</td>
<td>40.00000</td>
<td>10.69198</td>
<td>0.735122</td>
</tr>
<tr>
<td>TRD</td>
<td>64.03186</td>
<td>66.20000</td>
<td>86.80000</td>
<td>0.000000</td>
<td>14.48392</td>
<td>-1.35149</td>
</tr>
<tr>
<td>FSF</td>
<td>75.60712</td>
<td>77.70000</td>
<td>90.20000</td>
<td>40.90000</td>
<td>9.245204</td>
<td>-1.61128</td>
</tr>
<tr>
<td>GVS</td>
<td>81.10136</td>
<td>83.90000</td>
<td>99.30000</td>
<td>0.000000</td>
<td>13.08590</td>
<td>-2.84936</td>
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<tr>
<td>MNF</td>
<td>69.40576</td>
<td>73.20000</td>
<td>95.40000</td>
<td>0.000000</td>
<td>16.21967</td>
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<tr>
<td>INV</td>
<td>51.28814</td>
<td>50.00000</td>
<td>80.00000</td>
<td>10.00000</td>
<td>16.15302</td>
<td>-0.56352</td>
</tr>
<tr>
<td>FIN</td>
<td>49.49153</td>
<td>50.00000</td>
<td>90.00000</td>
<td>10.00000</td>
<td>16.92558</td>
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<tr>
<td>PRR</td>
<td>45.69492</td>
<td>50.00000</td>
<td>90.00000</td>
<td>10.00000</td>
<td>17.47521</td>
<td>0.468364</td>
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<tr>
<td>FCR</td>
<td>32.49153</td>
<td>30.00000</td>
<td>79.00000</td>
<td>7.000000</td>
<td>14.39975</td>
<td>0.922385</td>
</tr>
<tr>
<td>PPP</td>
<td>2217.428</td>
<td>651.6000</td>
<td>46638.70</td>
<td>0.000000</td>
<td>4705.847</td>
<td>4.943130</td>
</tr>
</tbody>
</table>

PPP\_IRN = 70.075656905*\text{BZF\_IRN} - 51.9337842863*\text{TRD\_IRN} + 124.14914143*\text{FSF\_IRN} - 42.9935824202*\text{GVS\_IRN} - 45.6099654719*\text{MNF\_IRN} - 27.6285048937*\text{INV\_IRN} + 31.4847680649*\text{FIN\_IRN} - 52.3811420177*\text{PRR\_IRN} - 27.1798822551*\text{FCR\_IRN}

PPP\_IRN: Value of investment in PPPs; BZF\_IRN: Iran business freedom; TRD\_IRN: Iran trade freedom; FSF\_IRN: Iran fiscal freedom; GVS\_IRN: Iran government size freedom; MNF\_IRN: Iran monetary freedom; FIN\_IRN: Iran financial freedom; PRR\_IRN: Iran property rights; FCR\_IRN: Iran freedom from corruption.

According to the model of Iran, a positive relationship among “business freedom, fiscal freedom, and property rights and value of investment in PPPs” have been seen. On the other side, “trade freedom, government size, monetary freedom, investment freedom, financial freedom and freedom from corruption” have negative relationship with PPP investments in Iran. According to the results, there are relationships among economic freedom indices and value of investment in the developing countries especially in Iran then economic freedom is a main success factor for the success of PPPs in Iran. The better economic freedom we have in Iran, the better conditions we will have for the implementation of PPPs.

Conclusion

The aim of this study is to examine the relationship between the PPP investments and a set of explanatory variables (economic freedom indices) by using panel data analysis to establish the determinants of PPP critical success factors from economic freedom perspective over
the period 1995 to 2008, and explore whether the main economic freedom indices can explain the success of PPPs. Based on the data availability, the following nine determinants of economic freedom are analyzed in this paper:

"Business freedom, trade freedom, monetary freedom, government size, fiscal freedom, property rights, investment freedom, financial freedom, freedom from corruption".

The main results of this study reveal that “business freedom, fiscal freedom and property rights have positive and statistically significant impact on the PPP investment while the variables of “trade freedom, government size and monetary freedom” have negative and significant impacts on the PPP investments. These findings strongly confirm the economic freedom impact on PPP success. The results of this study have delivered some insights on the success of PPPs in developing countries. Therefore, the study may provide some useful information for future

<table>
<thead>
<tr>
<th>Specification</th>
<th>Fixed effect</th>
<th>Random effect</th>
</tr>
</thead>
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<tr>
<td>Constant</td>
<td>0.0692(-1.82492)</td>
<td>0.1453(-1.46081)</td>
</tr>
<tr>
<td>BZF</td>
<td>0.1387(1.4853)</td>
<td>0.0981(1.66014)</td>
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<tr>
<td>TRD</td>
<td>0.0177(2.38853)</td>
<td>0.1338(1.50401)</td>
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<tr>
<td>FSF</td>
<td>0.0227(2.293067)</td>
<td>0.0069(2.72218)</td>
</tr>
<tr>
<td>GVS</td>
<td>0.2954(-1.4865)</td>
<td>0.1603(-1.40799)</td>
</tr>
<tr>
<td>MNF</td>
<td>0.2025(-1.7787)</td>
<td>0.2444(-1.16668)</td>
</tr>
<tr>
<td>INV</td>
<td>0.3366(-0.96285)</td>
<td>0.2692(-1.10732)</td>
</tr>
<tr>
<td>FIN</td>
<td>0.9685(-0.03953)</td>
<td>0.6065(-0.51573)</td>
</tr>
<tr>
<td>PRR</td>
<td>0.1445(1.46399)</td>
<td>0.0902(1.70041)</td>
</tr>
<tr>
<td>FCR</td>
<td>0.0731(-1.79969)</td>
<td>0.0648(-1.85411)</td>
</tr>
</tbody>
</table>

N 275 275
R2 0.57813 0.06887
Adj. R2 0.53012 0.03725
F-test 12.0403 2.17796
DW-test 1.11574 0.99584

Figures in the parentheses for directional prediction are t-statistics.
research on PPPs in the developing countries. This research has reached to a model for Iran and its results can be applicable for other similar developing countries. Since developing countries have been facing some factors different from that in other developing countries and their situations are different, some hypotheses and pre-understandings were rejected. Therefore, design and implementation of PPPs in developing countries need some vast studies before their implementation. So countries need to establish PPP unit in order to prepare themselves for successful implementation with comprehensive design.

According to the model of Iran, a positive relationship among “business freedom, fiscal freedom, and property rights and value of investment” in PPPs have been seen. On the other side, “trade freedom, government size, monetary freedom, investment freedom, financial freedom, and freedom from corruption” have negative relationship with PPP investments in Iran. According to the results, there are relationships among economic freedom indices and value of investment in the developing countries especially in Iran then economic freedom is a main success factor for the success of PPPs in Iran. The better economic freedom we have in Iran, the better conditions we will have for the implementation of PPPs.

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