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Factors Affecting the Calculations of Return on Investment (ROI) in Public-Private Partnerships (PPP) Projects in Egypt

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Abstract

Public authorities and governments in many countries tended to allocate to the private sector the operations management of existing PPP projects and for financing new projects. There are a lot of benefits from following this approach for all parties. These benefits included risk mitigation, cost savings in governmental expendures, service improvement, employment opportunities, and enhancement in economic indices.

This approach was called public-private partnership (PPP). This term was defined as "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" (World Bank, 2016).

Public-Private Partnerships (PPP) projects become an important methodology for governments of both developed and developing countries, as a result from crucial role and their worldwide use. The PPP methodology enables public authorities and governments to allocate risks to different parties especially the private sector.

According to the World Bank report the private financial participation in Egypt has accounted $219,229.82 Million in the period from 1990 to 2000. This figure has increased to $998,667.36 Million in 2015 (World Bank, 2016).

PPP projects are usually more difficult to implement than other traditional procurement models because of their complexity and that their nature and their long duration. Previous research studies on several PPP projects showed that a number of problems exist in the project returns. Additionally, these researches show that there is a need for an objective, reliable and practical return assessment model for PPP projects. This required model will help decision makers to assess the profitability of PPP projects at their early stages. To apply PPP projects in Egypt successfully, one of the fundamental requirements is to perform and implement a comprehensive analysis of Return on Investment (ROI). To do that analysis, it should include the factors affecting the ROI relating the projects' influences such as ; financial, legal, political, social . . . etc.

Keywords

Egypt; Economy; PPP; ROI; Factors; affectin; iflation; decision maker; investment

1. Introduction

Public Private Partnership (PPP) is a procurement system that has emerged as one of the most important approaches for delivering projects in the recent Years. PPPs are forms of joint endeavor or collaborating between public and private sectors for financing , constructing, developing and operating projects (MOF, 2014).

There is a need to identify and allocate all factors associated with the calculations of the ROI of the PPP projects. There are many public-private partnerships past histories and project experiences to highlight factors critical to the success of future projects. However, there is no comprehensive study that measures the ROI of a future PPP project. In the absence of such a study, it is extremely difficult for government agencies, industry personnel, and academics to accurately and effectively analyze PPP projects. Furthermore, analyze and evaluate the effectiveness of PPP projects.

2. Definition of PPP

The definition of PPP projects is "PPP is a long-term contractual relationship between the public sector and the private sector for the purpose of having the private sector deliver a project or service traditionally provided by the public sector. PPP projects do not minimize the public sector's responsibility to improve public services, only the methodology for its provision and procurement is different" (MOF, 2014).

The governments are responsible for providing people with the major needs (such as electricity, water sanitation etc.) the governments are also responsible for building the airports, metro stations and provide highways. It was historically assured that the public sector alone without any support, was not capable to provide such projects and services in the required manner (MOF, 2014).

In contrast, the private sector was involved in areas where there is economic profit such as industry, agriculture and retail operations. The Private sector had proven its capabilities to manage resources more effectively than the public sector. Due to that fact, the private sector helped the public sector in the reform and the upgrade of to the standards. Accordingly, the private sector can afford the following four principal roles:

- Provide additional finance and capital
- Secure professional management and skills
- Added value to the consumer
- Better identification of needs and requirements
- Optimal uses of resources

The PPP concept is not the only issue that has been argued between researchers and many other parties but also the pros and cons of PPP have undergone extensive debate too. Two point of views about this debate: The first believes the positive results will not be achieved without PPP, while the second believes that would happen despite the partnership rather than because of it. The second viewpoint can be proved through the mandatory partnership which sometimes occurs through privatized projects that create new organizations, which find themselves obliged to collaborate with the original organization. (Osborne, 2000)

Also, the debate poses many questions about PPP as an efficient method for public sector reform, such questions include: what are the suitable conditions that make PPP successful and in which areas may PPP fail. The answers to such questions lead us to establish an understanding of the suitable ways and areas of cooperation between the public and private sectors to enhance the successful factors and meanwhile time decrease the failure of PPP is more than obtain project funding or even project management.

The government's role wouldn't be minimized with PPP existence, in contrary it would provide more creation in governmental roles, as long as the private sector is professional and qualified. Thus, PPP methodologies have motivated the government authorities to be able to obtain a suitable position in managing, controlling and evaluating

PPP projects with private partners by investing in its competitive advantages, such as the massive public sector projects, to fulfill its needs of financial resources and qualified human resources.

The PPP process has logical stages in order to build strong structures of new forms of partnerships; this process requires hard work from governments to think in ways which could assist them in developing such partnerships. Moreover, it requires the answer to many questions before thinking of any form of partnership such as: with whom may the government share, and how and which of the many partnering options available should be employed. Furthermore, assessing both benefits and risks of any form of PPPs.

2.1. The Principal Participants in PPP Projects

Different parties are participated in PPP projects, Such as; sponsors, investors, funding institutes, consultants, construction firms, and operators. The PPP contractual structure could vary from other projects to accommodate the difference and the singularity of that project.

In PPP projects the funding, design, construction and operation must have a definite time called concession period, which should be acceptable to meet the expected return on investment (ROI) to investors. Subsequently, ownership of that project returns back to the government or any other public authority without any charges or fees (Eghbal Shakeri, 2002).

The stakeholders that may be a part in the PPP project are the government or public authority, contractors, lenders, sponsor, supplier, investors, grantor, and finally the off-taker.

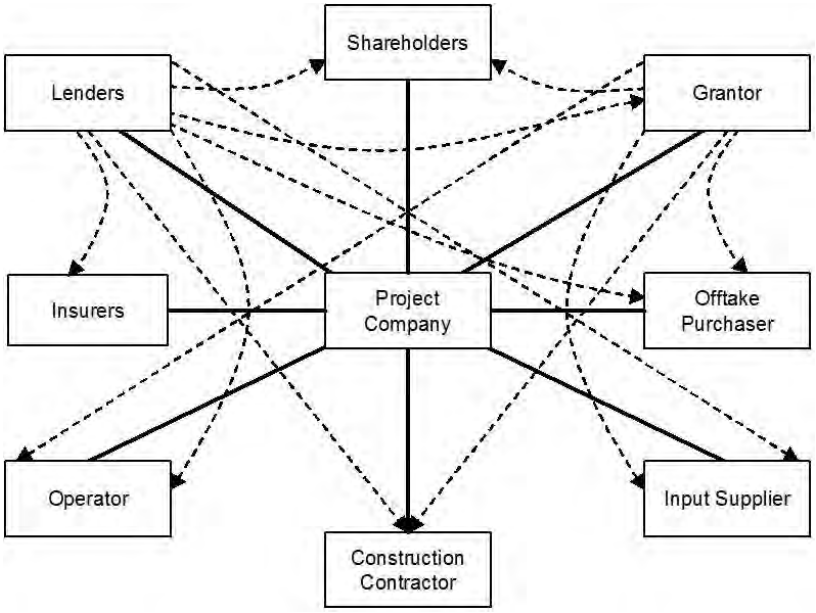

Figure 1. Typical Structure of PPP project (Neil Cuthbert, 2016)

2.1.1. The Public Sector

The most important player in PPP projects is government or public authority because it requires a particular and special attention in coordination and cooperation with all parties involved to achieve the required service. The government proceeds with the project authorization and secure legislations needed. Consequently, arrange a concession agreement with the private sector. The requirements and expectations of both parties the government as well as will the private sector need to be addressed to reach the win- win situation. Therefore, PPP projects concept requires an absolute support, because of such projects are large and complex in its nature and need a lot of considerations regarding legal, regulations, and financial aspects especially in developing countries.

Many of investors are mostly hesitant on taking a decision regarding PPP projects unless they obtain the necessary guarantees related to land acquisition, stability in inflation, exchange rates, taxes . . . etc. All of these concerns are applied through the project life cycle.

2.1.2. The Sponsor

The second important stakeholder in PPP projects is the project developer or project association which certainly consisting of professional organizations in all aspects ; legal, funding, design, construction, operation , insurance and maintenance. All of these associations will be in multiple forms of consortiums or by separately and individual participation. The sponsor who will responsible to handed over the project to the public authority or government.

2.1.3. The Supplier

The supplier is the company which of supplies all equipment or materials needed for the project.

2.1.4. The Investor

The investor may exist as a financial institute, Construction Corporation, vendor, operator or other types of shareholders. The role of the investor is to secure funds for the project. Depend on the type of investors, funding channels would be determined if it is direct investment by individual shareholders or provide equities from financing entities. The investor carry a high risk for a long duration projects, therefore must insured the equity lent by an insurance company to secure investment.

2.1.5. **The Off-taker**

According to the need of the required service or the project, the off-taker definition party varies from country to another .If the government or public authority responsible and guarantees to pay the fees to the developer; it is believed that this authority is an off-taker. Hence, the public authority should have a good credit rating and tariff because they are responsible for the revenues risks of the project. Therefore, off-taker agreement must be negotiated properly, well addressed all unforeseen factors and all financial issues that might impact the project. If the private sector or developer intends to secure initial investment from income payments or tariff, that might expose the project to big jeopardy.

2.1.6. **The Contractor**

The contractor's role in PPP project is to execute and implement the project effectively to meet the required degree of quality. The contractor responsibilities start from initial stages of the project. The contractor company might be an individual construction company or a consortium that includes multiple disciplines; design, structural, MEP..etc. In most cases, the contractor might be one of the shareholders in Project Company.

2.1.7. **The Operator**

The operator is a professional entity that specialized in providing operation and maintenance to the project. Generally the operator earns its revenues according to the off-take agreement as mentioned above. The operator starts its role and involvement from design to handle over the project back to the public authority. The role of the operator is very important and crucial in PPP projects, the project's success rely on operator‘s performance throughout the project life cycle.

2.1.8. **The Lenders**

Generally, the lender is an either an agency or financial institute that provide the project funds. According to the debt/equity ratio, the lender contributes in the project. Minimum equity is the high risk for the lender and investor itself. All PPP projects must have a strong lender to secure the funds needed to the project especially in early stages without any revenues or incomes from credit rating or tariff.

2.1.9. **Equity provider**

The equity provider is a funding approach, by which, PPP projects are partially funded in a small percentage 10-30% by injecting capital in the project initiation, and the remaining percentage funded by lenders. The equity provider is a private shareholder, operator, contractor, supplier or financial entity that invest in the project and gain profit when project meets its purpose from investment perspective (Osborne, 2000).

2.2. PPP in Egypt

In Egypt, A legal framework for PPP projects has been issued called the PPP Law (67 for the year 2010). Therefore, a new body has been established at the Ministry of finance called the PPP Central Unit. For establishment of standard PPP Contracts, standardized procedures as well as verify the procurement documents.

It is expected that Egypt will assign around 5.5 to 7& of its yearly GDP to finance infrastructure projects' needs which include new investments for new projects in addition to maintenance of existing projects. The main objective is to across the gap by accelerating the mobilization of the private capital. Since 2004, Egypt has performed structural reform which necessitates the government to implement infrastructure reform (MOF, 2014).

In PPP projects and to secure the delivery of the specified level and standard of services, the Government retains close control over. In turn, PPPs will open up opportunities for the domestic contracting and financing sectors and that are including smaller contractors who are expected to gain considerably profits from this program.

2.2.1. **Overview**

In recent Years Egypt has raised the spending on major projects such as; natural gas distribution, building new homes, water treatment plants and sanitation, maritime ports and airports. There are regulated frameworks that allow PPP projects to take its place in Egypt. These regulations are in accordance with the best practice regulations worldwide. Bidding and awarding procedures must be in a transparent approach concept.

It is mandatory to perform a cost–benefit analysis using a public-sector party called comparator. The 2010 PPP law prohibits the confiscation of project assets by public authorities or the government. In 2012, Egypt amended the rules relating to PPP projects to give the option of arbitration procedures instead of using the Egyptian courts, which takes place under the UN Commission on International Trade Law (UNCTRAL) (Economist, 2015).

The Public Private Partnership Central Unit (PPPCU) is the unit responsible for PPP projects in Egypt and one of the Ministry of Finance subordinates. The PPPCU was established in 2006 and based on international practices and models. Its role basically is to mandate and manage the full life cycle of PPP projects such as; risk assessment, tendering and procurement process, bid selection, sign contract, project initiation and financial closure. Therefore, The PPPCU include diverse expertise that provide the needed studies; technical, legal, tendering and contracting. These expertise relevant to line Ministers of Finance, Housing and Utilities, Economic Development, Transportation, Investment, Legal Affairs and chaired by the Prime Minister.

Due to the tendency of line ministries to conduct the PPP methodology unilaterally, the PPPCU has to improve relationships with the different ministries by consolidate efforts to be clear and unified in procedures , training the ministries' staff and develop them to enhance their capability to manage these types of contracts. By which, eliminating all types of contradictions or unilateralism.

2.3. First successful public-private partnership (PPP) project in Egypt

One of the successful PPP projects is the urban wastewater treatment plant with an average daily flow of up to 250,000 m^3 per day. Capacity to serve more than 1 million residents, the expected population increase of New Cairo at the time the project was designed. A drinking water shortage was identified as a pressing issue in Egypt's environmental sustainability, particularly in very densely populated areas. The existing wastewater treatment infrastructure did not produce water with adequate levels of quality to enable the water to be used to irrigate agricultural and urban green areas, forcing freshwater to be used instead. The government decided to build new infrastructure to reuse urban wastewater for the purposes mentioned, thereby reducing freshwater use. In addition, the project would reduce the water pollutants entering the River Nile.

Awards received by the project:

- Water Deal of the Year, awarded by Global Water Intelligence in 2010
- PPP African Deal of the Year, by Euro money/Project Finance magazine in 2010
- Bronze Award—Middle East and North Africa, by Emerging Partnerships in 2013

Location: City of New Cairo, Egypt (Jordi Salvador, 2016).

2.4. Factors to be considered to ensure success of PPP projects

PPP projects have variety of high risks elements that should be addressed, because long duration of the project as well as the capital costs are very high. Therefore, when assessing projects, it is necessary to identify and analyze, the different factors affecting its success.

PPP projects guidelines in Egypt that published by the PPP Central unit PPPCU, "Risk allocation is at the heart of how PPPs are structured." The factors affecting the success of the PPP Projects and ROI prior to that success are: Project finance, Design, Construction, and Operation.

2.4.1. Finance

- Secure funds
- Infaltion rates
- Interest Rate and tax increases
- Price escalation in project components
- Exchange rates

2.4.2. Design and development

- Suitability of the design
- Development problems
- Problem testing
- Variants of design and development
- Design delivery

2.4.3. Construction

- Cost overrun
- Construction delay and delivery schedule
- Defective construction
- Scope change
- Site accessibility
- Construction variations and claims
- Disputes and Arbitration

2.4.4. Operation

- Operation productivity
- Revenue loss
- System breakdown
- Maintenance frequency
- Prices escalation
- Comples or non innovation technology
- Accidents and safety issues

3. Return on Investment (ROI)

A performance measure and metric used to evaluate the worthiness of an investment or project comparing with a number of different projects or investments. Return on investment (ROI) measures the revenues and the outcome of an investment relative to the investment's cost. The return of an investment is divided by the cost of the investment, and the result is a percentage or a ratio (Marty Schmidt, 2017).

The return on investment formula:

$$ROI = (Revenues - Cost)/Cost \tag{1}$$

Return on investment is a common evaluation metric because of its simplicity. Return on investment (ROI) can be used as a primary assessment of an investment's gains and profitability. If an investor does have a profit and that means positive (ROI), then these ROI values can direct him as to which investments are preferable among others. (Marty Schmidt, 2017)

Return on Investment (ROI) is an assessment metric among others for speculate and evaluate the financial outcomes and revenues of investments. Investors use the return on investment (ROI) to compare the magnitude of expected gains with the magnitude of costs, the ROI ratio calculates as net investment gains divided by total investment costs. Therefore, when comparing two or more projects, and the risks or any other unforeseen circumstances are equal, the project with the higher (ROI) is considered the better choice (Bailey, 2014).

3.1. Return on Investment (ROI) needed information

The return on investment (ROI) as an evaluating tool or metric is not sufficient basis for selecting an opportunity or project over another. The reason is (ROI) compares costs to revenues but says nothing about unforeseen, uncertainty or any other factors that might affect the results such as (Design Changes, Inflation, interest rate, construction delay, etc.). The investors and decision makers must take into account the different (ROI) outcomes.

Therefore, all the factors mentioned above must be considered in calculating Return on Investment (ROI) to obtain an efficient and realistic result or indicators before taking any decision regarding either a new opportunity or comparing two projects.

4. PPP projects and Return on Investment (ROI)

In devolping countries , that would be considered not stable and high risk from political perspective, and according to the nature of PPP projects , investors need a practical evaluation metric to assess their revenues against costs . The project with long period is a high risk project . Investors with this concept, works on quicker returns based on a shorter period to gain fast profits and could be re-invested and generate more returns and profits than expected from one project with long period. Some other investors are risk takers with the concept of ; the higher the risk , the higher the profit . Therefore , PPP projects with its long duration and risks , investors and deciosion makers are normally use the return on investment (ROI) as a long duration evaluation metrics

4.1. Project Funding

Funding PPP projects is a crucial factor that projects' successes rely on, external funding is needed and required for project's initiation and that may be either injected from private sector or public sector. The remaining required investments for PPP projects are mostly recover in future from expected revenues. According to the concept of special purpose vehicle (SPV), a project company may be established by the investor and may be as a form of consortium that conclude different specialized companies or a single large company. The shareholders will not funding all project requirements, they will secure a proportion as equity and required funds from financial entities that secure the capital required instead.

To provide the required funding, investors or financial institutes must study the attractive factors of the PPP projects such as; the well-designed and shorter payback period, the suitable tolls or tariffs which secure the future cash inflow, the transparent regulations to reduce and mitigate market risks (Eghbal Shakeri, 2002).

4.2. Tariff Design

Some of the considerations are needed to design tariffs:

- Return on investment for private operator
- The standards of the services and its costs
- End user affordability
- Cost recovery needed

The most commonly used metrics by the investor to evaluate the financial worthiness is the return on investment (ROI), and the internal rate of return (IRR) is the metrics used by the operator to evaluate the potential revenues of the project against its own cost of equity. The combination of service costs and tariffs determine the commercial feasibility of the project .The operator has the chance to improve the potential financial outcome by being particularly efficient in investment and operations. Therefore, the operator will only get involved in a project if there as a chance to make a profit given a determined set of service standards and tariffs (Marty Schmidt, 2017).

5. Questionnaires

The researcher has quantified all these tangible factors using questionnaire. The aim of this questionnaire is to quantify the factors that affect the ROI calculation of the PPP projects. In this questionnaire experts are asked to weigh each one based on its importance and possibility of happening during the life cycle of the PPP project in Egypt.

5.1. Sample Size

Cochran (1963:75) developed the Equation (2) to yield a representative sample for proportions for large populations

$$n_0 = Z^2 pq / e^2 \tag{2}$$

n_0 = the sample size,

Z^2 = the abscissa of the normal curve that cuts off an area at the tails Figure 2

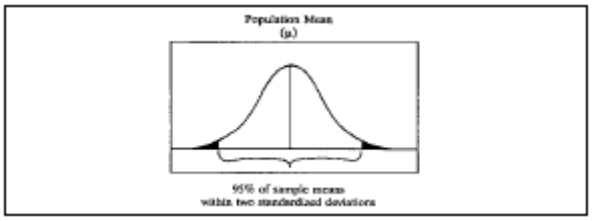

Figure 2. Cochran sample size illustration

e = the desired level of precision.

p = 0.5 (maximum variability).

The estimated proportion of an attribute that is present in the population.

q = 1-p.

Z = 1 for more than 3000 population; founded in statistical tables and equivalent to the area under the normal curve for 95% confidence level and $\pm 5\%$ precision.

The sample size (n_0) can be adjusted using Equation:

$$n = n_0 / [1 + (n_0 - 1) / N] \tag{3}$$

n = the sample size

N = the population size (Cochran, 1963:75).

5.2. Data Collection

According to the Egyptian Federation for Construction & Building Contractors in Egypt in 2016, the approximately number of contractors in Egypt is 31000 contractors and due to the Egyptian Syndicate of Engineers Civil and Architectural Consultants are approximately 1000 consultants. By interviews and sent questionnaire to many of investors, project management experts, consultants and operators, and according to the following criteria:

- The whole population = 32000
- Confidence Level = 95%
- Margin of Error = 10%

The size of the sample is determined by using the equations above and the results obtained that it has to be 96 participants. The questionnaire was actually sent to a sample of 200 variety stakeholders in Egypt. A total 102 of owners, consultants, project management firms and contractors replied to the questionnaire sent.

5.3. Risk Rating Matrix

Risk Matrix is made of simple table where the risks are grouped based on their likelihood and the extent of damages or the kind of consequences that the risks can result in as shown in Figure 3. The risk matrix is a tool to illustrate and evaluate the project's risks based on the likelihood and its effect. Different consequences regarding different factors resulting from using such matrix (Dumbravă, 2013).

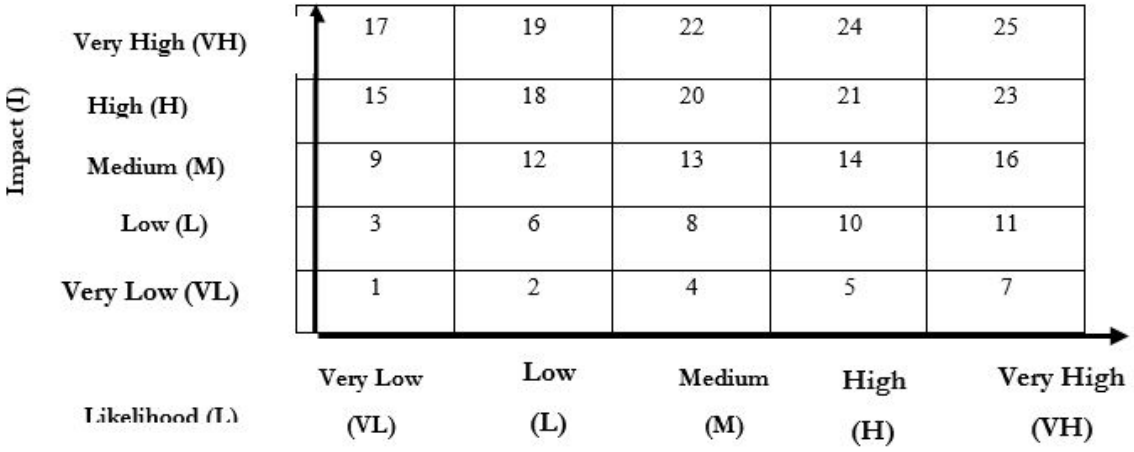

Figure 3. Risk Matrix

An example of risk matrix with ranking and probability effect shown in Table 1. The high rates indicate a great level of effect. Questionnaire survey designed , based on the factors that affecting the calculations of the return on investment (ROI) in PPP projects in Egypt as shown in Table 2. The purpose of the questionnaire is to provide a consistent scale to rate the expected effect for each factor.

Table 1. Risk effect scale

Rate	Probability	Effect
Very High	Probable to exist	If exists, cause a major cost overrun, schedule delay
High	Will probably occur in most instances	If exists, cause substantial cost increasing, schedule delay and major reduction in performance
Medium	Might occur	It occur , cause noticeable budgeted cost increasing but may be manageable within contingency, slippage to delivery dates, noticeable degradation in performance
Low	In some circumstances might occur	Cause slight increase in budgeted , minor slippage in delivery dates ,minor reduction in performance but manageable

Continued on next page

Table 1 continued

Very Low	No probability to occur	Cause no effect on budget , no impact on project millstones , neglected reduction in performance and if happened it would be manageable

Table 2. Factors and explanation

No.	Factor	Explanation
1	Land availability	The factors related to consequences that emerge from delay in land acquisition
2	Changes in Scope	The factors related to the change that might be required in the original agreed upon scope with the impact in cost and time
3	Changes in Design	The factors related to the changes of the original design or defectives in the that design which need corrective actions regarding these defectives
4	Cost overrun	Uunexpected extra costs during project life cycle.
5	Delay in Construction	Delays in implementing or executing the project due to any circumstances
6	Defective Construction	Exists if to facility , system or the equipment cannot meet the construction specification and standards
7	Weak operating productivity	The productivity of operating system is cannot meet the expected output specifications
8	Complex systems	Related to the incompatible systems or interface with other systems that might not perform as an integrated system
9	Accidents issues	The unexpected accidents or hazards which occurs in frequent basis and cause unacceptable outputs
10	Price Escalation	Changes in the cost or price of specific goods or services in a given economy over a period
11	Weak coordination	If one party or more in the project cannot perform in coordination and cooperation manner , resulting a great negative impact on the project
12	Tax increases	Increasing in taxes fees that not considered before
13	Inflation rate	Sustained increase in the general price level of goods and services in an economy over a period of time
14	Volatility of exchange rate	The rate at which one currency will be exchanged for another. It is also regarded as the value of one country's currency in relation to another currency
15	Higher level of interest rate	The amount of interest due per period, as a proportion of the amount lent, deposited or borrowed
16	Drawback economic	The probability of losing demand due to any downside or drawback of the economy resulting revenues below expected
17	Political issues	The political factor is a major factor if exists or occur, especially in an instability ,situation it would reflect negative impacts on other factors

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Table 2 continued

18	Unsuitable regularities	The actual regulation cannot meet the investments' expectations which resulting a large cost and time negative impact on the project
19	Delays in Approvals	Delays in necessary approval or legalization either in initiation stage or testing and commissioning of the project

6. Results

The factors sent to questionnaire participants must have a sum of "1" in their weight to comply with the traditional equation as shown in Table 3. It is clear that results obtained of the questionnaire have an influential degree and tangible percentage that might change the (ROI) calculated by that equation.

Table 3. Weight of factors

Question	Factor	Weights	Round	Percentage
1	Land	0.053908356	0.054	5.40%
2	Scope changes	0.053908356	0.054	5.40%
3	Design changes	0.051212938	0.051	5.10%
4	Construction cost overrun	0.061994609	0.062	6.20%
5	Construction Delay	0.061994609	0.062	6.20%
6	Defective Construction	0.04851752	0.049	4.90%
7	Low productivity	0.037735849	0.038	3.80%
8	Complex system	0.056603774	0.057	5.70%
9	Accidents and safety issues	0.040431267	0.04	4.00%
10	Price Escalation	0.061994609	0.062	6.20%
11	Poor coordination	0.059299191	0.059	5.90%
12	Tax increases	0.040431267	0.04	4.00%
13	Inflation rate	0.035040431	0.035	3.50%
14	exchange rate	0.043126685	0.043	4.30%
15	interest rate	0.045822102	0.046	4.60%
16	Downside economic events	0.061994609	0.062	6.20%
17	Political Interference	0.064690027	0.065	6.50%
18	Unsuitable regulatory policy	0.059299191	0.059	5.90%
19	Approval Delays	0.061994609	0.062	6.20%

The economic factors such as inflation rate, cost overrun and interest rate are extremely influential for the PPP projects due to the long duration of the project which were not considered before in the previous studies. There is no doubt that the political factor has a major effect especially in Egypt. Administrative factors such as poor coordination with the administrative and governmental agencies and approval delays have a high rate weight that influence the (ROI) as shown in figure 4.

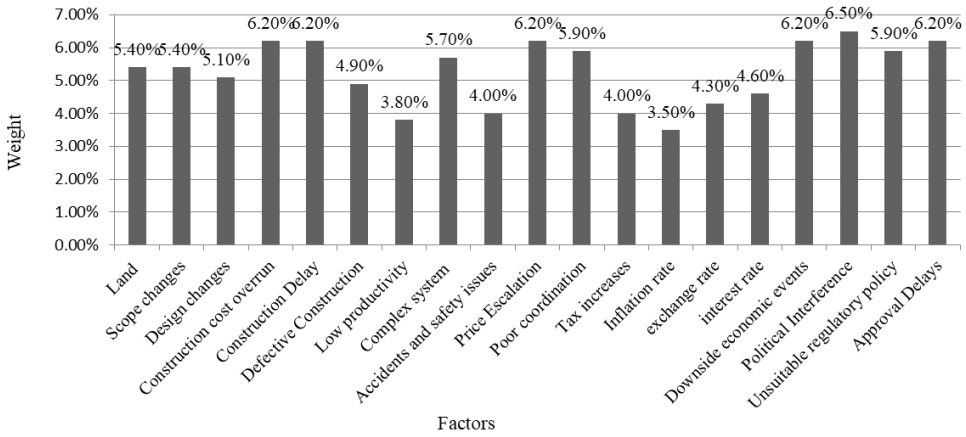

Figure 4. Weights Histogram

7. Conclusions

As explained earlier, PPP projects have a special nature in terms of study, implementation, and operation. Duo to the long life duration of the project, which may extended more than 20 years, this particular nature requires consideration of all factors that may affect the process of calculating the return on investment (ROI). These factors, if present at different rates, whether high or low, will certainly affect the decision-maker negatively or positively and thus give results quite different from the traditional equation. Therefore, we have done a questionnaire to measure the effect of these factors on the return on investment in Egypt. These factors were found to have a very high impact when they occur, and they will certainly occur with great probability. Therefore, the results and figures derived from this equation:

$$ROI = (Revenues - Cost) / Cost \tag{4}$$

need to take into account the factors discussed previously. According to the results obtained from the questionnaire, we notice that all the factors mentioned are realistic factors, but different in terms of the phase of the project, whether the project at the phase of design, implementation or operation. These factors may also vary according to the other circumstances or influences such as; financial, technical, political, etc. However, in all cases, these factors should be considered as an effective influence to the decision maker. The results of this questionnaire may differ from one industry to another and from one country to another, but it is very impressive and very high.

8. References

1. The World Bank PPI Database,*http://www4.worldbank.org/sprojects*. World Bank; 2016

2. Ministry of Finance, *Public Private Partnership Central Unit.* National Program for Public Private Partnership; 2014

3. https:// www.business-case-analysis.com/return-on-investment.html.*Boston: Marty Schmidt;* 2017

4. Stephen Osborne, *Public- Private Partnership. London:* Rutledge; 2000

5. Broadbent, J. & Laughlin. *Introduction about PPPs. Accounting, Auditing & Accountability Journal;* 2003

6. Eghbal Shaker. *Public- Private Partnership (PPP) Approach.* Manchester, United Kingdom*;* 2002

7. Neil Cuthbert, Atif Choudhary. *The Emergence Of Public-Private Partnerships (PPPs) In The Middle East And Africa*. Middle East and Africa PPP Guide. February; 2016

8. The Economist.Intelligence Unit. *Evaluating the environment for public–private partnerships in Africa*. The Infrasco; 2015

9. Reginald U. Bailey. *A Risk Analysis Tool for Evaluating ROI of TRA for Major Defense Acquisition Programs* . ProQuest LLC; 2014

10. Vasile Dumbravă. *Impact Matrix in Analysis and Risk Assessment Projects*. Journal of Knowledge Management, Economics and Information Technology, Romania; 2013

11. Jordi Salvador, Francesc Trillas, Joan Enric Ricart & Miquel Rodríguez Planas . *New Cairo Wastewater treatment Plant (Egypt).IESE; 2016*