



## Construction Projects Cash Flows and their Impact on the Project Implementation Time and Cost

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### ملخص البحث :

يهدف هذا البحث إلى دراسة الآثار الناتجة عن تأخر التدفقات النقدية و بخاصة على تكاليف و زمن المشاريع و كذلك مدى تأثيرها على ربحية المقاول و اقتراح بعض البدائل التي من شأنها الحد من هذه الآثار و تحديد الإيجابيات و السلبيات لهذه البدائل من خلال الدراسة النظرية لطبيعة التدفقات النقدية في مشاريع البناء و العوامل التي تؤثر في انتظام التدفق النقدي و الوقوف على الآثار السلبية الناتجة عن الخلل في انتظام التدفق النقدي ، و من ثم تم عمل بحث لأخذ رأي المعنيين و المختصين و الخبراء لمعرفة أرائهم و الوقوف على مدى نجاحة ما تم التوصل إليه .

و تكونت أداة البحث من أحد عشر نقط تعريفية لمعرفة خبرات و مؤهلات و درجة الصلة بين فرد الإستبانة و النقطة البحثية كما شملت على إحدى و خمسين نقطة استبانة تناولت في مجموعها ماهية التدفقات النقدية و الآثار السلبية المصاحبة لإختلال التدفق النقدي و آثاره على المقاول كما تناولت البدائل المقترحة لتقليل الآثار السلبية المصاحبة لإختلال التدفق النقدي و مدى فاعليتها .

و قد استخدم المنهج الوصفي التحليلي في تحقيق أهداف الدراسة حيث استخدم البرنامج الإحصائي SPSS في تحليل البيانات و كانت عدد الاستجابات الكاملة ( 64 ) فقط ( أربعة و ستون ) استجابة مفردة يمكن القياس عليها و جرى تقسيم النتائج إلى جزء تعريفي و ثلاثة أجزاء رئيسية وفق الأساس الذي جرت عليه مناقشة موضوع الدراسة ، و قد أثمرت في مجموعها في التعريف بطبيعة الخلل في التدفق النقدي و استخلاص مجموعة البدائل التي من شأنها الحد من آثاره السلبية .

### Abstract:

This research aims to study the effects resulting from the delay in cash flows, especially on project costs and time of completion, as well as the extent of their impact on the profitability of the contractor and to propose some alternatives that would reduce these effects and to identify the pros and cons of these alternatives.

And that is through the theoretical study of the nature of cash flows in construction projects and the factors that affect the regularity of cash flow and stand on the negative effects resulting from the imbalance in the regularity of cash flow, and then research was done to

take the opinion of stakeholders, specialists and experts to find their opinions and stand On the effectiveness of what was reached.

The search tool consisted of eleven identification points to find out the experiences, qualifications and degree of connection between the individual of the questionnaire and the research point. It also included fifty-one questionnaire points that dealt with in total the nature of cash flows and the negative effects associated with the imbalance of cash flow and its effects on the contractor as well as the proposed alternatives. To reduce the negative effects associated with the imbalance of cash flow and the extent of its effectiveness.

The descriptive and analytical approach was used in achieving the objectives of the study where the statistical program SPSS was used in analyzing the data and the number of complete responses was (64) only (sixty-four) a single response that can be measured. The results were divided into an introductory part and three main parts according to the basis. The subject of the study was discussed, and it resulted in the definition of the nature of the imbalance in cash flow and in extracting a set of alternatives that would reduce its negative effects.

- **Introduction**

Contractors are always under pressure to secure adequate financial resources to be able to complete the projects on time, and with adequate quality. Delaying due contractor payments will have a profound impact on contractor ability to adhere to contract terms. The approach used by institutions to secure necessary funds to carry out its activities is a critical success factor for the project. As governments suffer financial shortages leading to delaying contractors' payments is one of the main reasons for the failure of projects. In many countries in the middle east, governmental contracts, oblige the contractor to complete construction activities regardless of owner payments status. This leads to creating significant pressure on contractor financial system and results in increasing bankruptcies and sever delays. Contractors adopt to those pressures by reducing their resource consumption, delaying construction activities, delaying payments to suppliers and labor, or reduce quality of works. Many problems arise due to lack of liquidity, this research investigates the risks associated with contractors' weak cash flows and its impact on project goals and the extent of the contractors' ability to adapt to those problems.

- **Research Problem**

Most medium contracting companies adopt clear mechanisms to cover and fill gaps and finance project needs. This is evident in their internal policies by investing the cash available to them to secure critical resources to project activities. Contractors strive to increase the amount of advance payments and reduce their payments to subcontractors and suppliers. while ensuring the regularity of the draws and the speed of disbursement and Dealing with subcontractors and suppliers on credit, as well as using bank facilities

whenever possible, and the delay in payment of construction contractors' dues directly affects their ability to fulfill their contractual obligations, which leads to the emergence of many financial and time claims against project owners, not only but also among subcontractors. This increases the costs and the period of implementation and may reach the stoppage of the project and resort to arbitration. This, in turn, reflects negatively on the goals of the owner, the contractor's continuity in the market, and the project's success indicators for each. Therefore, this research aims to study the effects resulting from the delay in cash flows, especially on the costs and time of projects, as well as the extent of their impact on the profitability of the contractor and to propose some alternatives that would reduce these effects and identify the pros and cons of these alternatives.

- **Research importance**

The importance of studying the cash flows of construction projects and their impact on the project implementation period and cost, in addition to studying the alternatives available to contractors to ensure continuity in the market, and to define the size of risks and losses that the owner and contractor will be exposed to separately, whether due to the cash gaps resulting from failure to fulfill the owner of the contractor's entitlements and within their maturity times, especially in circumstances of economic transformation, and the additional costs and additional periods that will entail, which helps those in charge of preparing and studying projects, taking into account the availability of the necessary financing and the means of covering it, and then avoiding the problems of delay or claims and achieving the desired objectives of the project.

- **Research Objectives:**

- Identify risks associated with delay of payments to medium contractor companies and their impact on project goals.
- Study the negative effects associated with the imbalance of cash flows and their impact on the duration and cost of project implementation.
- Proposing a number of alternatives that contribute to reducing the negative impacts on projects and studying the pros and cons of each of them.

- **Literature Review**

Many researchers have addressed the impact resulting from delayed cash flows to contractors. The disruption of cash flows to contractors has an impact on project cost, time, and contractor profitability. This literature examines three main points; 1) Definition of cash flows, 2) identification of risks associated with the imbalance of cash flows and their impact on the contractor, and 3) the alternatives presented to reduce the negative effects associated with the imbalance of cash flow and the extent of their effectiveness.

## **1. Definitions of Cash Flows**

The two authors (Rob Reider & Peter B. Heyler, 2003) stated that managing the company means managing its cash flow and in this context, many researchers sought to develop ideal models for cash flow plans and predict the cash path of projects and companies. There are many studies, including those related to the application of time and cost integration technology and to provide accurate cash flow results using computer programs without much human participation. However, most of those models did not take into account the effect of the unlikely problems on the project's cash flow due to the uncertainties arising from the nature of the projects such as the unexpected cost of the project, weather conditions, labor, material expenses etc., and in a study on models integration of time, cost, accuracy of cash flows and giving the same amount of time to subcontractors contrary to what happens in reality. Contractors generally adjust their payment strategy according to the performance and reliability of the subcontractor. This may make mathematically / statistically developed cash flow models required in the bidding stage, but they are not reliable for conducting an estimation and specifying the financial requirements for projects. In this point, it examines what was observed by previous researchers about the concept of cash flows, their objectives, how to manage them, and the problems of measuring them. And since any start of cash flow management should be by developing a clear plan for cash flow, not only to know the incoming cash flow of the company or even to cover the needs of cash outflows, but to estimate the adequacy of the cash available to control the project and advance the implementation process as well as to avoid financing gaps whenever possible and allowing appropriate time for the measures required to fill those gaps when they occur.

## **2. The negative impact associated with the imbalance of cash flows and their negative effects on the contractor**

The success of projects is related to their delivery within the specified period, the allocated budget, and the expected quality (Majid, 2006, Owaolabi et al, 2014). Delay in the completion of construction projects and infrastructure projects is a challenge of a high degree. It often leads to an increase in construction costs due to the extension of time in addition to poor productivity, disruption of work and loss of revenue through lawsuits between The contracting parties leading to abandoning the project (Owolabi et al, 2014; Sambasivan & Soon, 2007). Many economies suffer from negative impacts and economic setbacks as a result of project disruption, and the delay in completing infrastructure projects has significant cost implications which in turn impede The movement of societal growth and its long-term negative effects on the lives of citizens, especially in the countries of the Arab Gulf region, where the percentage of income rises and the large size of budgets directed to infrastructure projects and other It is one of the sectors where there is a low level of project completion, a prevalence of exaggeration in costs, and a clear delay in completing and closing these projects, which resulted in heavy losses among contractors. The costs arising from these delays are often shown in terms of the accrued interest on loans and the

high cost of maintaining management personnel, as well as the continuous escalation in wages and prices of materials. In Saudi Arabia, Asharq Al-Awsat newspaper (Issue No. 12077, 2011) reported what was announced by the National Committee for Contractors in the Council of Saudi Chambers about contracting with an international consulting office to prepare a comprehensive field study on the consequences of stalled and delayed implementation of government projects on the state. According to the newspaper, dealers estimated the size of delayed projects. Its implementation is halted at (147 billion dollars) for reasons related to contract disputes and weakness in financing. Riyadh was published in its issue No. (15295, 2010) according to a study that included 392 senior officials in the government sector, and the results of that study showed that the difficulties And the problems facing the infrastructure projects in the Kingdom of exceeding time and costs were the main reasons behind the delay of 850 infrastructure projects out of 1035 between 1992 and 2009. Among the projects that were completed during the mentioned period, 41% of them witnessed cost overruns and 82% of them Exceeded delivery time for projects. In conclusion, the effects resulting from the delay in disbursing dues are harmful to both the owner and the contractor and the harm is due to the beneficiaries of these projects, either by disrupting them or delaying their use. Matters may get worse when litigation is resorted to, as rights will be wasted as is the case in Most of the developing countries.

### **3. The alternatives presented to reduce the negative effects associated with the imbalance of cash flow and the extent of their effectiveness**

What is noticeable about the research that has been covered in the developed regions of the world at this point is that they do not address the imbalance in cash flow. Rather, most of their research revolves in its entirety on developing a mechanism that enables them to predict the project's cash flow and how to develop models that enable managing those flows and Especially after setting the laws and regulations governing the construction industry, and this indicates the nature of the environment surrounding the construction and contracting sector in those countries in which many of the organizing laws apply, with a high degree of neutrality and efficiency for the construction system in general, and a high degree of culture and awareness of those in charge of This system may be due to the extent of their respect and adherence to FIDIC contracts, especially after a not short period of suffering experienced by those countries and most developing countries now live in it. The nature of the understanding of contracts in general and construction contracts in particular and the extent of balance between the parties to the contract so that The contract does not tilt in one direction without another, or it guarantees the interest of one party at the expense of the other party, but the equality of the two parties to the contract is taken into account in all that is covered by the contract, and each party bears its full responsibilities and the consequences of its default in the event of its default on its obligations E contractual, which is what made the disruption of cash flow a definite matter that does not need to be studied in developed regions of the world, for example what Dr. Sherif Al-Hagan mentioned in his

lecture entitled (Variation Orders and Claims in the Tightening Industry, 2019) after he showed that the contractor's cash flows It is like the blood circulation for a person and he mentioned that (in the United Kingdom, if the owner fails to pay the dues owed to the contractor, it is permissible for the contractor to demand compensation for the returns of those delayed amounts equal to the applicable bank returns plus 3% for that delay period, and in Scotland the same thing But with an interest of 7% added to bank returns) and accordingly, the rights are preserved according to the contract and not by the power of one of the contracting parties if there is no strong party or weak party between the two parties to the contract and accordingly there is no need for them to conduct studies or research to address the imbalance in cash flow In developed regions as is the case in developing regions, and it should be noted that in the Kingdom of Saudi Arabia, there are attempts to address the effects resulting from poor cash flow without reaching the root of the problem. Concerned with the establishment of the Saudi Contractors Authority, which is a professional body established in 2015 affiliated with the Ministry of Commerce and Investment and concerned with managing and developing the contracting industry in Saudi Arabia and solving differences and problems that arise between contractors and striving to preserve their rights. However, the authority did not take the role that it should play, as it is not entitled to represent the contractor in any of the cases and according to the text, cases can only be resolved between contractors one another and it is basically a regulatory body whose purpose is to organize and not represent and defend rights Contractors are also handcuffed if they try to defend the rights of contractors, as there are no laws that enable it to operate in this way, which makes the authority itself a burden on contractors, including the fees it imposes on them as a result of the compulsory participation, and it should be noted that despite The existence of the Authority, but 42% of the companies that declared bankruptcy were from the contracting sector, according to the latest declaration of the bankruptcy committee according to the Saudi newspaper Al-Watan in 2019. However, it can be said that the Saudi Contractors Authority has taken a positive step that must be followed by steps and studies for the reasons for the delay or stumbling of projects, especially the reasons that refer to the owner in financing the project and the appropriate compensation to reach the continuity of the contractor in the work and the success of the project and achieving the desired objectives of Construction industry in the Kingdom.

- **Data Collection and Analysis**

A data collection questionnaire was developed and distributed to 50 construction participants, only 31 copies were received. Seventeen of the participants were interviewed while filling out the questionnaire. Also, electronic version of the questionnaire and 33 were received. These results were analyzed after compiling them into one template to extract and deduct the research objectives.

- **The subject of the questionnaire**

The questionnaire was designed to deal with the topic of the research and it was divided into an introductory part that includes the data of the target people from the questionnaire and their knowledge and experience of the aspects covered by this research, in addition to three main parts that deal with the research topic as follows: -

- Determine the risks associated with the owner's delay in disbursing dues
- The negative effects and risks associated with the delay in disbursing dues on the contractor and the project
- Procedures and alternatives taken by the contractor to reduce the negative effects of the owner's delay in payment

- **Description of the statistical sample:**

The questionnaire included a set of questions that clarify the characteristics of the target sample for the questionnaire in terms of the nature of the business to which the questionnaire component belongs, which is contradictory to where some were in the contractor's side, which is the primary concern of the research point, and some of them are on the side of the owner or his representative (consultant). This contrast and diversity gives an enrichment of the sample and a degree of reliability in it. The questionnaire also included some questions that would indicate the components of the individual questionnaire such as the degree of knowledge, qualification and experience and the degree of proximity to or distance from the research point within the individual facility of the survey which is in Taken together, it gives a certain degree of confidence in the opinions we got

- **The questionnaire results**

After obtaining the results of the questionnaire and collecting them in one template and excluding the deficient from them, we have (64) (only sixty-four) single responses without repetition and the results were divided into three parts that were analyzed as follows:

The first part of it is using Likert's five-point scale, which shows the rating that each degree of importance takes:

And in this part of the sample, the relative average was calculated through the following equation:

$$\text{Weighted Average} = \sum (\text{Grade Weight} \times \text{Grade Frequency}) / \text{No. of Responses}$$

The second part was a multiple choice, in which the questionnaire sample was unanimously collected, and the degree of priority for each of them was determined.

The third part is a proposal for a set of points in which I left determining the degree of priority (importance) for the individual of the questionnaire himself or adding what he deems appropriate, and then the grouping took place taking the degree of priority according to what was mentioned in the sample.

## Analysis

This section illustrates the findings of the research regarding the lack of cash flows for construction projects and its impact on the duration and cost of the project implementation.

## Risk Identification

Determine the risks associated with delaying the payment of dues by the owner (RISK IDENTIFICATION)

And it deals with identifying weaknesses in which contractors are located and which exacerbate the negative effects associated with the disruption of cash flow and the emergence of financing gaps, according to the following table: -

Table No. (1) Survey summary, first axis

No.	Questionnaire point	Opinion survey group	Responses ( % )
1	The interest of medium contracting companies in establishing an independent department for technical studies	Not interested	48.5 Never mind 12.5 is weak
2	The interest of contracting companies in making initial plans for the cash flow of their projects	Not interested	32.8 Never mind 29.7 is weak
3	Factors affecting the reliability of the cash flow plan prepared by the contractor for himself prior to the commencement of the project implementation work	1. Real knowledge of the owner and the degree of responsiveness to the disbursement 2. A good understanding of the nature of the project components, implementation time and cost vocabulary for all project items 3. The expertise and qualifications of those involved in the preparation 4. The methods used 5. Available preparation time	60% 49% 39.25% 19.15.% 11.6%
4	The importance of reviewing and updating cash flow statements	Poor to average attention	47/64
5	The initial value of cash allocated by the contractor to start the project	From (10-15)% of the project value	37/64



6	The nature of the sources of cash from which the contractor (company / institution) derives his need to start the project	1. What the company monitors in terms of liquidity available to it for the project 2. Reliance on advance payments as a source of financing 3. Participation of other entities for the purpose of financing (banks - finance companies) 4. Other sources (other activities) in the company that have continuous periodic returns	81.5% 45.31% 35.7% 27.86%
7	The effect of the financial guarantees provided by the contractor on the initial cash value needed for the project	Effective - Very effective	38/64
8	Acceptance of the contractor's entitlement to returns on financial guarantees provided to the owner?	Acceptable - completely acceptable	43/64
9	The effect of the nature of the project on the initial value of cash needed by the contractor to start the project	Effective - Very effective	58/64
10	The degree of interest of medium contracting companies in conforming to the initial cash flow statements	Poor attention - medium	39/64
11	The degree of interest of medium contracting companies in the precautionary measures to reduce the occurrence of financing gaps	Poor attention - medium	40/64
12	The percentage of deficit in the incoming cumulative cash flow at which the investor would resort to developing a business-out scenario	20 - 30% of the contract value	35/64
13	The percentages at which the contractor accepts the closure of the project despite the suspension of disbursement	From 10% - 30% of the business value	44/64
14	The degree of contractor's eligibility for material compensation as an effect of the owner's financing deficiency	Fully deserved	44/64

The previous table shows the following: -

- It is clear from the schedule that most of the contractors neglect to manage the technical studies

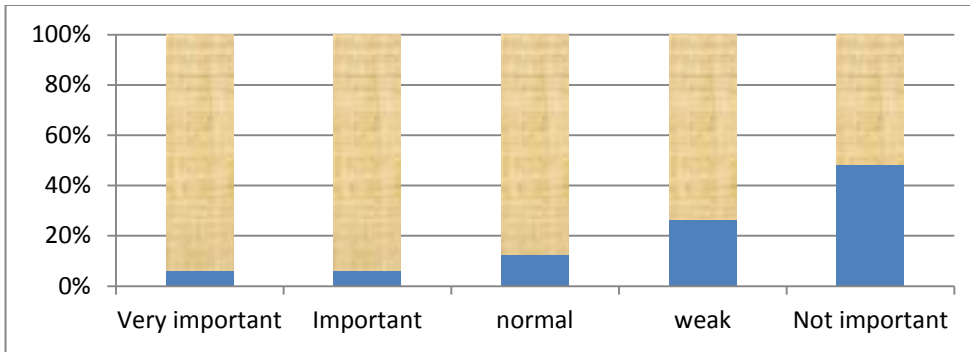


Figure (1-1) Shows the extent of contractors interest in the work of a department specialized in technical studies

- Not making cash flow plans and neglecting plans if they work, according to the following figure

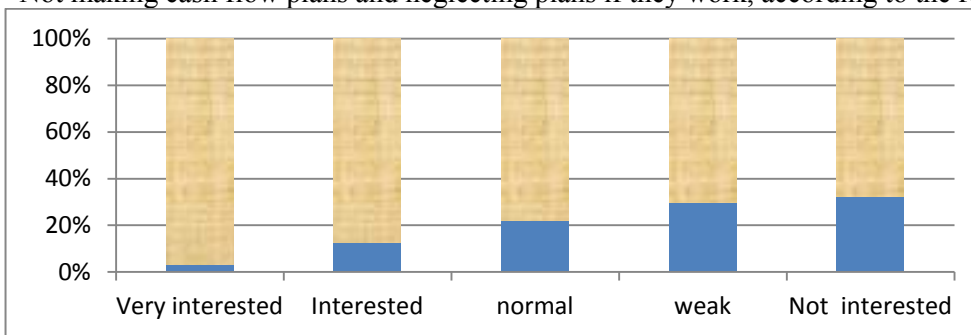


Figure (1-2) Shows the extent of contractors' interest in cash flow plans

- Lack of attention to the burdens of financial guarantees as a number affecting the costs of the project. It must be carefully examined and the laws governing it.

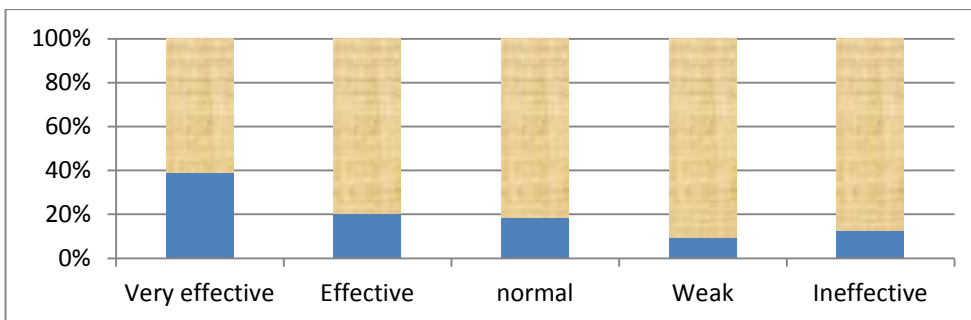


Figure (1 - 3) Shows the effect of bank guarantees on project costs

- Real knowledge of the owner and their response to disbursements is the basis of cash flow, not contractual commitment.

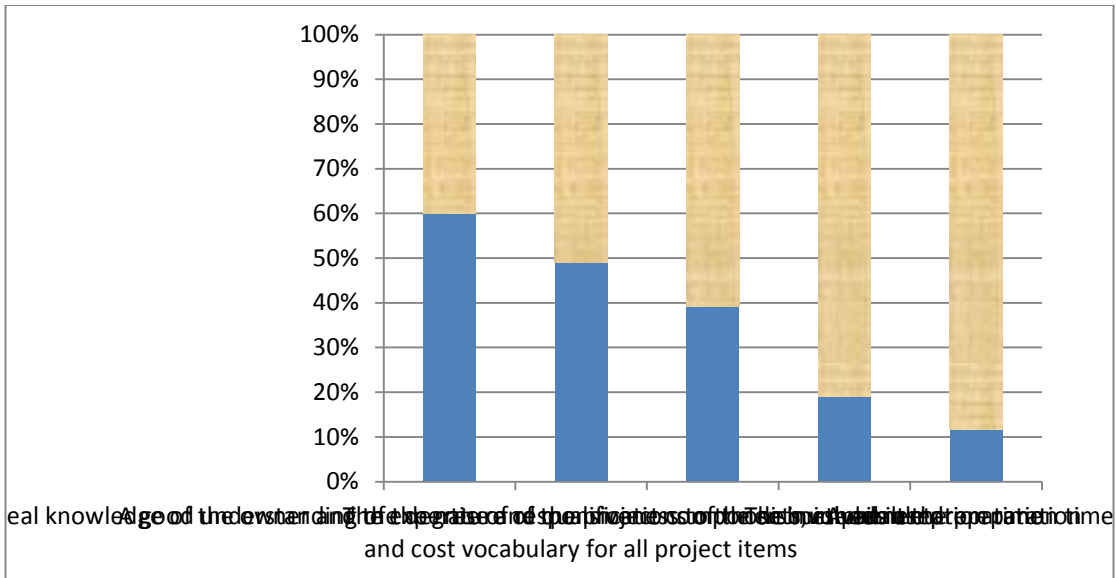


Figure (1 - 4) Shows factors affecting the reliability of the cash flow plan

- The conviction of many concerned with the contractor's entitlement to compensation for the owner's financial shortcomings, in contrast to the reality, which makes the enactment of new laws that regulate this matter inevitable

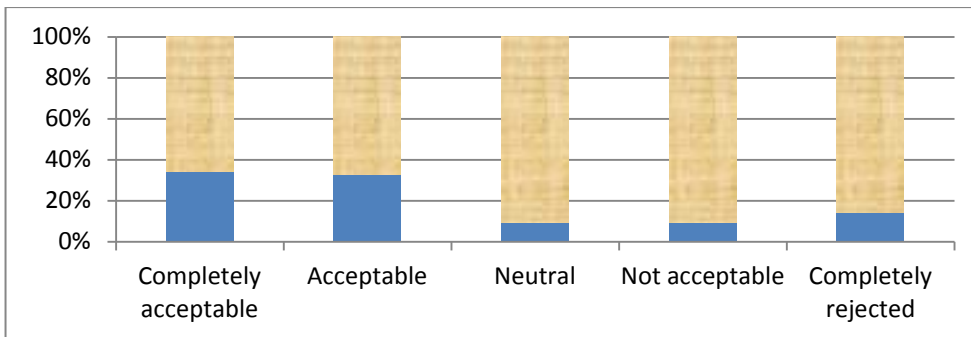


Figure (1-5) Shows the extent of the contractor's eligibility to compensate for the owner's financial failure

- Lack of attention to the precautionary measures that must be taken into account to reduce the occurrence of financing gaps and control the negative effects associated with the disruption of cash flows,

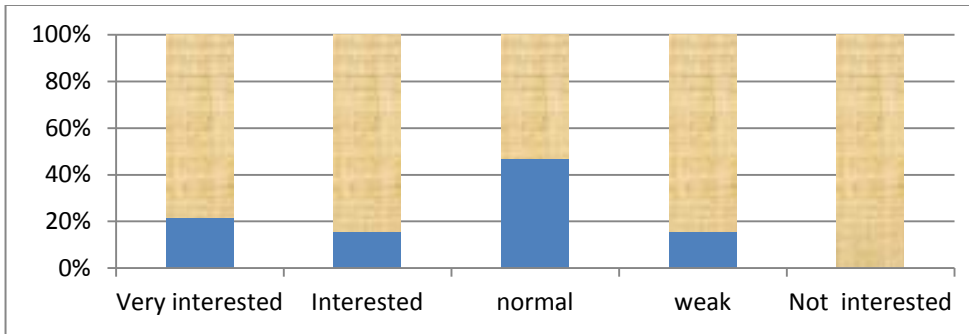


Figure (1-6) Interest in ingiberal measures towards owner's financing gaps

And all this may be due to the lack of a department specialized in technical studies linking two basic lines, namely the execution line and the cash flow line according to pre-set plans for this purpose, which this department undertakes to develop and follow up on, and not to leave that to the project management skill, which in most cases is its greatest interest in line Implementation and its problems, in addition to the urgent need to enact new laws that protect the rights of contractors, as well as spread a high level of awareness among the groups of interested and dealers within the construction sector of the nature of the damages that occur to the contractor, the project, and the owner due to the disruption of the project's cash flow.

## Risk Impact

Negative effects and risks associated with delayed payment of dues on the contractor and the project (RISK IMPACT)

Table No. (2) Survey summary, second axis

No.	Questionnaire point	Opinion survey group	Responses ( % )
1	The contractor was affected by the owner's financial deficiency at the beginning of the project rather than at the end	Effective - Very Effective	64/58
2	The degree to which the contractor's direct costs are affected by the owner's delay in fulfilling his dues	Effective - Very Effective	64/52
3	The degree of influence of the nature of cash flows on the growth of the contractor	Effective - Very Effective	64/60
4	The degree to which the economic transition conditions affect the ability of medium-sized companies to implement projects	Effective - Very Effective	64/50

5	The degree of influence of the applicable laws on the ability of medium-sized companies to implement projects	Effective - Very Effective	56 / 64
6	The impact of the owner's lack of financing on the prices and costs of materials in light of stable market conditions or not	Effective - Very Effective	40/64
7	The effect of the owner's lack of financing on the projects depending on the nature of the materials used	Effective - Very Effective	52/64
8	Most of the difficulties that face the contractor when payment of dues from the owner is delayed, arranged in order of priority	<ol style="list-style-type: none"> <li>1. The salaries and entitlements of workers and employees</li> <li>2. Subcontractors and those dealing with the company</li> <li>3. Suppliers</li> <li>4. Warehouses</li> <li>5. Mechanisms and equipment</li> </ol>	<p>74.7%</p> <p>43.4%</p> <p>40.4%</p> <p>24.H%</p> <p>24.%</p>
9	Factors affecting the contractor's request for funding for the project, arranged in order of priority	<ol style="list-style-type: none"> <li>1. The project revenues are sufficient to cover this financing with its burdens</li> <li>2. The completion of the project without losses even if it does not achieve profits</li> <li>3. If the delay fine is greater than the financing burden</li> <li>4. The project must be closed to allow for another work</li> </ol>	<p>62.4%</p> <p>51.3%</p> <p>49.1%</p> <p>26.6%</p>
10	The applicable bank interest can be considered the minimum acceptable compensation for the contractor for covering the owner's financing deficiency.	Acceptable - completely acceptable	50/64
11	The degree of impact of the project stoppage period on the equipment, formwork, etc. on the site	Effective - Very Effective	56/64
12	The principle that the contractor does not bear the additional burdens of bank guarantees	Acceptable - completely acceptable	48/64
13	Determine the degree to which the contractor will be affected by the additional costs of the inventory due to the lack of financing of the owner	Effective - Very Effective	43/64

14	The ability of the contractor not to incur additional maintenance burdens as an effect of the owner's financing deficiency	Acceptable - completely acceptable	48/64
15	The degree of the influence of the owner's insufficiency of financing on the productivity of the teams and crews working on the site	Effective - Very Effective	52/64
16	Measuring the damage to the project as a result of the owner's lack of financing	Harmful - badly harmful	48/64
17	The ability to compensate the contractor and to fine the owner for delaying the final payments and has initially received the works and the desired benefits from them are realized.	Acceptable - completely acceptable	48/64

This axis deals with the negative effects associated with the disruption of cash flows and their effects on the contractor's profits, project implementation times and their cost. It appears from the table that the contractor, the project, the owner and the beneficiaries of the project will be negatively affected by the disruption of cash flows, especially in the case of service projects. Its disintegration, and this appears from the burdens the contractor will face, which can be summarized as follows:

- Increased direct costs

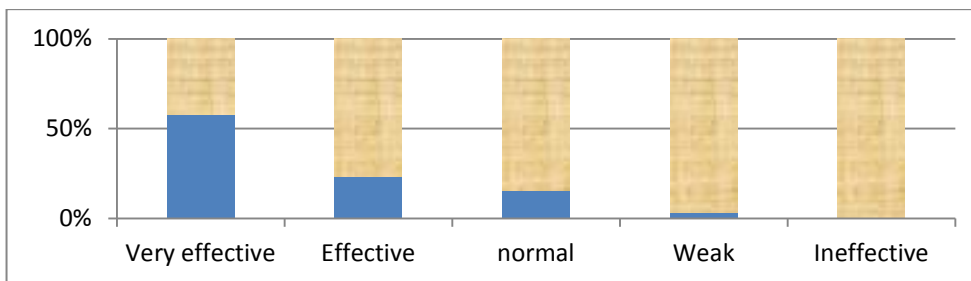


Figure (2-1) Illustrates the increase in direct costs as an effect of the owner's financial deficiency

- Decreased productivity and the associated increase in costs

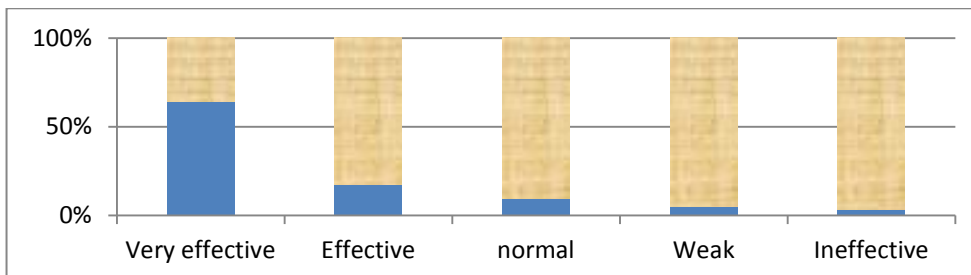


Figure (2-2) Illustrates the effect of the owner's financial failure on productivity

- The emergence of additional burdens resulting from the increase in maintenance and inventory periods

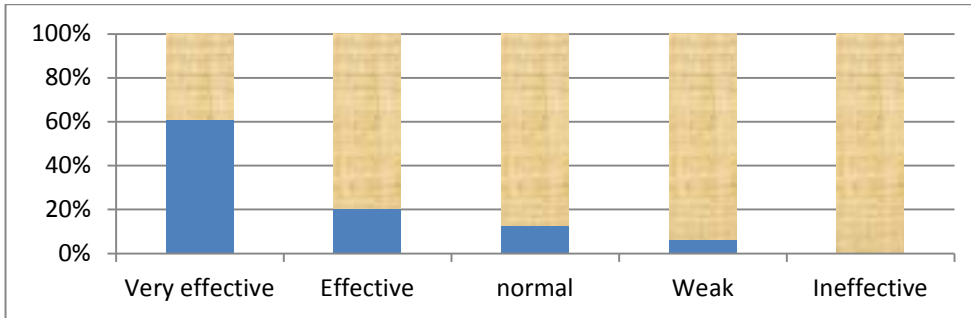
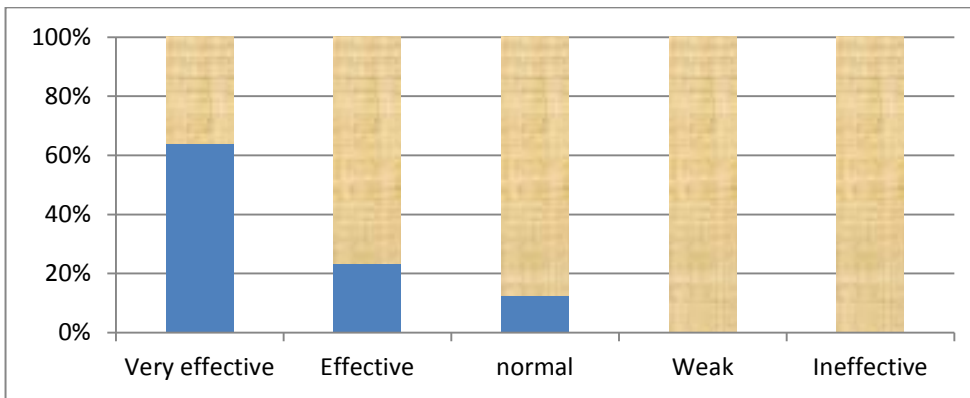


Figure (2 - 3) Shows the effect of the owner's financial deficiency on maintenance and inventory

- Increasing depreciation rates for equipment, machinery, tools, etc.



• Figure (2-4) Shows the effect of the owner's financial deficiency on machinery and equipment

- The negative impact on the growth of contractors, which in most cases may lead to the closure of many construction companies

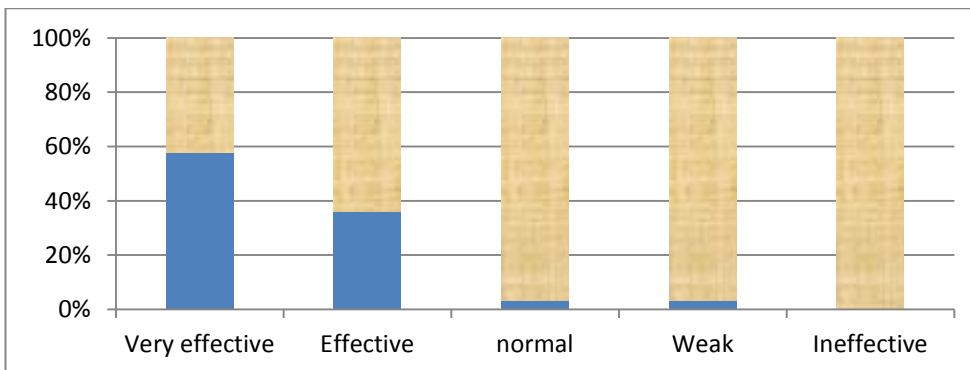


Figure (2-5) Shows the effect of the owner's financial deficiency on the growth of the contractor

- Lack of ability to complete or close projects

- Lack of trust between the contractor and his employees and clients.
- Taking the burden of financing when calculating the costs of the project, which is harmful to the construction environment in general, as it makes the prices higher than their normal rates and limits competition only to contractors with financial abundance.

In summary, there is a direct relationship between the growth of both the contractor and the owner on the one hand and between the regularity of cash flow on the other side. The same relationship exists between the success of the project and the regularity of cash flows, among other factors that are not the subject of discussion

### **Risk Mitigation Measures**

Actions and alternatives taken by the contractor to reduce the negative effects of late payment of dues by the owner ((MITIGATION)

Table No. (3) Survey summary, third axis

No.	Questionnaire point	Opinion survey group	Responses ( % )
1	Determining the degree to which the contractor's efficiency in managing and monitoring cash flow affects its ability to overcome financing gaps resulting from the owner's default	Effective - Very Effective	48/64
2	The procedures available to the contractor to overcome the condition to continue work despite the suspension of disbursement with priority for each	<ol style="list-style-type: none"> <li>1. Neglecting the condition of continuing and stopping and demanding compensation</li> <li>2. Negotiate with the owner in order to expedite the exchange</li> <li>3. Continue work until closing the project, even if no disbursement has taken place.</li> <li>4. Resorting to arbitration and litigation</li> <li>5. Determine the ideal stopping point for it and stop there</li> </ol>	<p>47.3%</p> <p>51.2%</p> <p>37.3%</p> <p>24.7%</p> <p>24.3%</p>
3	The factors that affect the contractors' selection of projects as one of the most important solutions to face the owner's financing deficiency, arranged according to the degree of priority	<ol style="list-style-type: none"> <li>1. Diversification of the parties that deal with and distribution to reduce risks</li> <li>2. Contractor's physical capacity</li> <li>3. The nature of the project and the owner of the project may favor the principle of a single project</li> <li>4. Profit - the size of the project - the desire to grow supports a single project</li> </ol>	<p>66.9%</p> <p>45.8%</p> <p>36.7%</p> <p>21%</p>



4	Precautionary measures taken by the contractor to overcome financing gaps	<ol style="list-style-type: none"> <li>1. Ensure that the down payment is increased and disbursed whenever possible</li> <li>2. Linking the supply schedules and suppliers' dues to the payment of extracts</li> <li>3. Linking the extracts of subcontractors to the project and disbursing them from the owner</li> <li>4. An alternative source of funding owned by the company</li> <li>5. Involving a bank as a financier for the project</li> </ol>	<p>58%</p> <p>47.6%</p> <p>38%</p> <p>32.3%</p> <p>29.3%</p>
5	The degree of impact of the precautionary measures taken by the contractor	Effective - Very Effective	52/64
6	The contractor's continuous reading and follow-up of the financial capacity of the Mac and the location of the project affect the contractor's efficiency in managing the financing gap.	Effective - Very Effective	51/64
7	The procedures that the contractor needs in the event that they predict the existence of a financing gap for the owner and a degree of priority for each of them	<ol style="list-style-type: none"> <li>1. Prepare for this with the required documentation tools and mechanisms.</li> <li>2. Determine the stopping point that serves his interests as a preliminary procedure.</li> <li>3. Estimate the time period of the owner and his ability as a contractor to skip it.</li> <li>4. Continue to work until it becomes evident that the owner is incapable</li> </ol>	<p>54.8%</p> <p>51.4%</p> <p>47.4%</p> <p>38.8%</p>
8	The degree of importance of the time period prior to the cessation of business as an effect of the owner's financial deficiency	Important - very important	52/64
9	The degree of impact of the stopping point on the inventory	Effective - Very Effective	52/64
10	Impact of business case status on breakpoint	Effective - Very Effective	64/64
11	The importance of the contractor taking into account the impact of the stoppage point on the inclusion of business items in the abstracts	Important - very important	61/64
12	The importance of the contractor's consideration of the impact of the stoppage point on his	Important - very important	58/64

	subcontractors		
13	The importance of documenting and making a case statement for the site	Important - very important	62/64
14	Determine the stopping point that serves both parties and negotiate with the owner	Important - very important	54/64
15	Procedures to be taken by the contractor if the project cannot be completed	<ol style="list-style-type: none"> <li>1. Documenting the project case</li> <li>2. Review the terms of the contract</li> <li>3. Accurately count the losses incurred by them and document them</li> <li>4. Observe the requirements of the stopping point</li> </ol>	<p>65.5%</p> <p>60%</p> <p>47.5%</p> <p>36%</p>
16	When calculating the period required for the extension of the project as an effect of the owner's financing deficiency, consideration must be given to both the value of the delayed amounts and the delay periods for those amounts, and this can be measured by the material value of one day of the delay compared to the material value for one day of the project.	Acceptable - completely acceptable	44/64
17	The procedures that the contractor needs to face the suspension of disbursement for three consecutive extracts	<ol style="list-style-type: none"> <li>1. Get the attention of the owner</li> <li>2. Reducing work on the site</li> <li>3. Descending of costs to continue until disbursement</li> <li>4. Gradual suspension of work on the project until complete cessation</li> <li>5. Continue to work according to site conditions</li> </ol>	<p>49.45%</p> <p>49.11%</p> <p>37.4%</p> <p>25.4%</p> <p>19.2%</p>
18	The project supply schedules should be of interest to the contractor, especially when indicators of financial distress appear to the owner	Important - very important	61/64
19	The procedures required by the contractor in the event that the owner refuses to implement some or all of the project	<ol style="list-style-type: none"> <li>1. Negotiating to reach a stopping point that serves both parties</li> <li>2. Determine the damages he suffered and request compensation</li> <li>3. Transferring the supplies schedule and warehouse to the owner's custody</li> </ol>	<p>67.6%</p> <p>53.5%</p> <p>45.8%</p> <p>23.7%</p>

		4. Respond to that	
20	The procedures needed by the contractor to cope with the irregular reduction of the contract	<ol style="list-style-type: none"> <li>1. Negotiating with a view to withdrawing the owner from his request due to the impossibility of achieving it</li> <li>2. Find items that can be postponed and fulfill the owner's desire</li> <li>3. Rejection of the request and adherence to the terms of the contract</li> <li>4. Responding to this for the remainder of the contract</li> </ol>	<p>66.5%</p> <p>47.4%</p> <p>45.3%</p> <p>21.5%</p>

This axis deals with the alternatives available to the contractor that contribute to reducing the negative effects of the disruption in cash flow and looking at the pros and cons of each of them. They can be divided into three main groups.

### **Mitigation Measures - Contractor**

It is the set of procedures that the contractor performs (financial and technical capacity - employment - location - equipment - materials) and in it he must first take into account avoiding the weaknesses that most contractors fall into, which was mentioned in the first part of this chapter, in addition to: -

- Careful and cautious about projects that need the largest percentage of cost at commencement
- Diversifying its financing sources as an additional alternative source of financing owned by the contractor
- Paying attention to the time periods that precede the cessation of work as an effect of the owner's financial deficiency
- Paying attention to stopping points and taking into account their impact on each of the business items - inventory - supply schedules - subcontractors - equipment, tools and succession
- Conducting periodic and regular documentation of the status of the site and matching the situation with the owner and his representatives
- Determine stopping points early, whenever needed

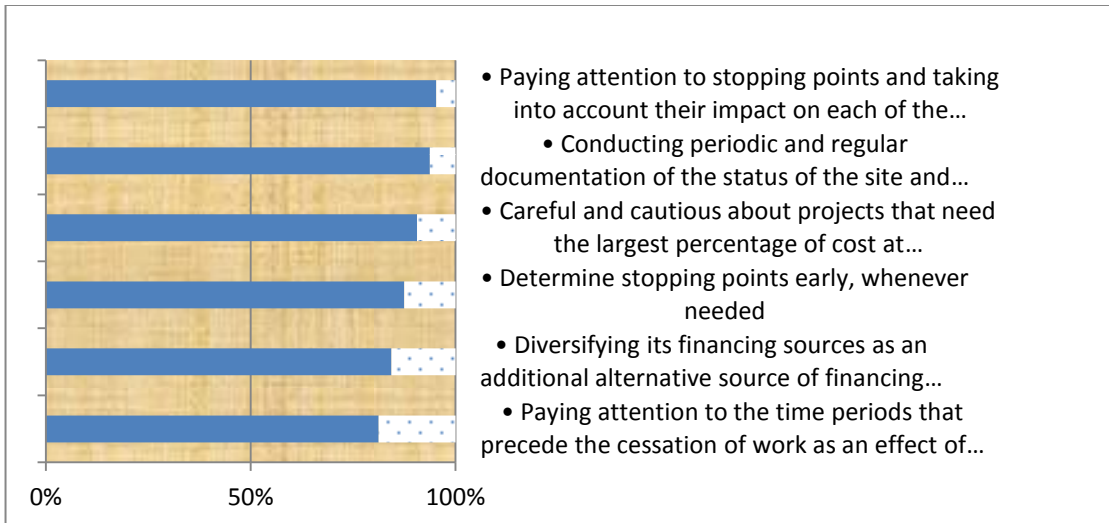


Figure (3-1) Shows the set of procedures that the contractor performs on himself

And as effective management limits the effects of the owner’s financing gaps, the stopping point has an important and prominent role in resolving the dispute between the contractor and the owner, preserving the rights for each of them, and preserving what has been accomplished on the site and in the condition that enables it to be used when needed. This clearly shows from the following figure, which shows the effectiveness of cash flow management and the impact of the stoppage point on each of the owner, contractor and project

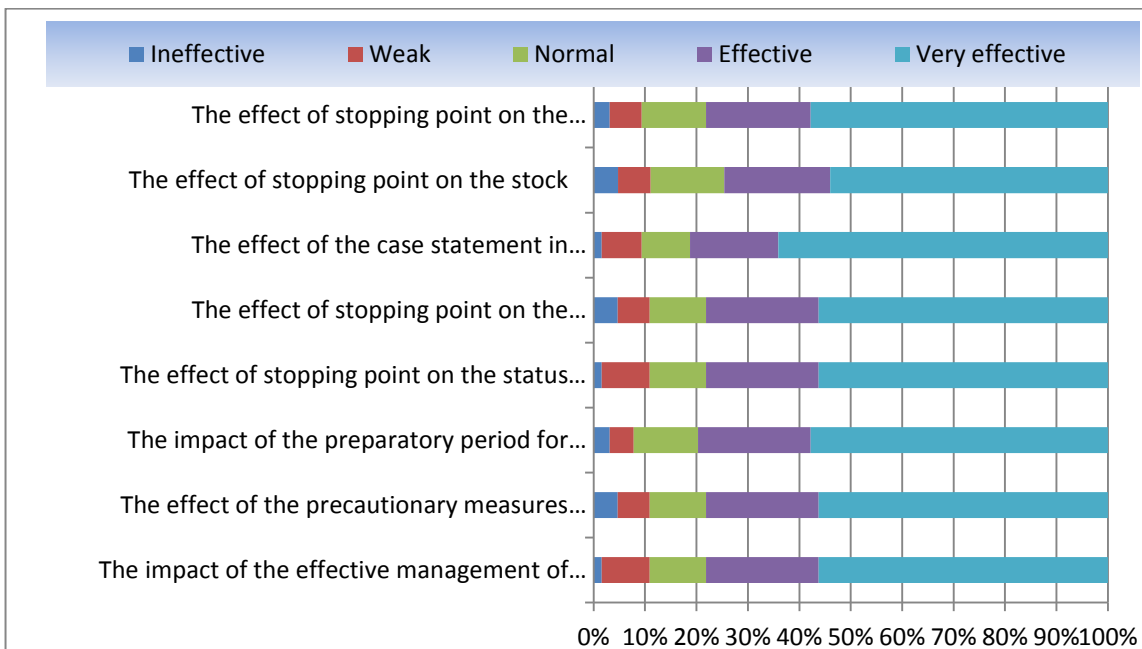


Figure (3-2) Illustrates the effectiveness of cash flow management and the impact of the stoppage point on the owner, contractor, and project

## **Risk Mitigation Measures – Suppliers and Subcontractors**

These are the procedures that the contractor performs on those dealing with him from subcontractors, suppliers, etc., and they are as follows:

- Linking supply schedules and suppliers' dues to collecting extracts from the owner
  - Linking the extracts of subcontractors to the project by disbursing them from the owner
  - The involvement of a bank as a financier of the project with a reasonable rate of profits
- Subcontractors and suppliers are not the contractor's opponents, but rather their tools. They must be preserved in a state that enables them to implement his project. The main contractor must not set time periods between collecting his dues from the owner and fulfilling his obligations towards them.

## **Risk Mitigation Measures - Owner**

These are the procedures that the contractor performs towards the owner and are as follows:

- Negotiate with the owner a clear mechanism for disbursing dues and that all supplies and specialized contracts with subcontractors are included in it.
  - Diversify the parties that the contractor deals with and distribution to reduce risks
  - Ensure that the advance payment is increased and disbursed whenever possible
  - Continuous monitoring of the financial capacity of the Mac and the location of the project subject of the contract is among its priorities
  - Study that fulfills the terms of the contract, especially the material part
- 
- The inclusion of financial and time compensation as an effect of the owner's lack of financing as one of the important provisions of the contract whenever possible
  - Bringing attention to the owner in the event of delayed payment of dues, with the expected effects and consequences
  - Transferring the supplies and warehouse schedules to the custody of the owner and linking them to the extracts

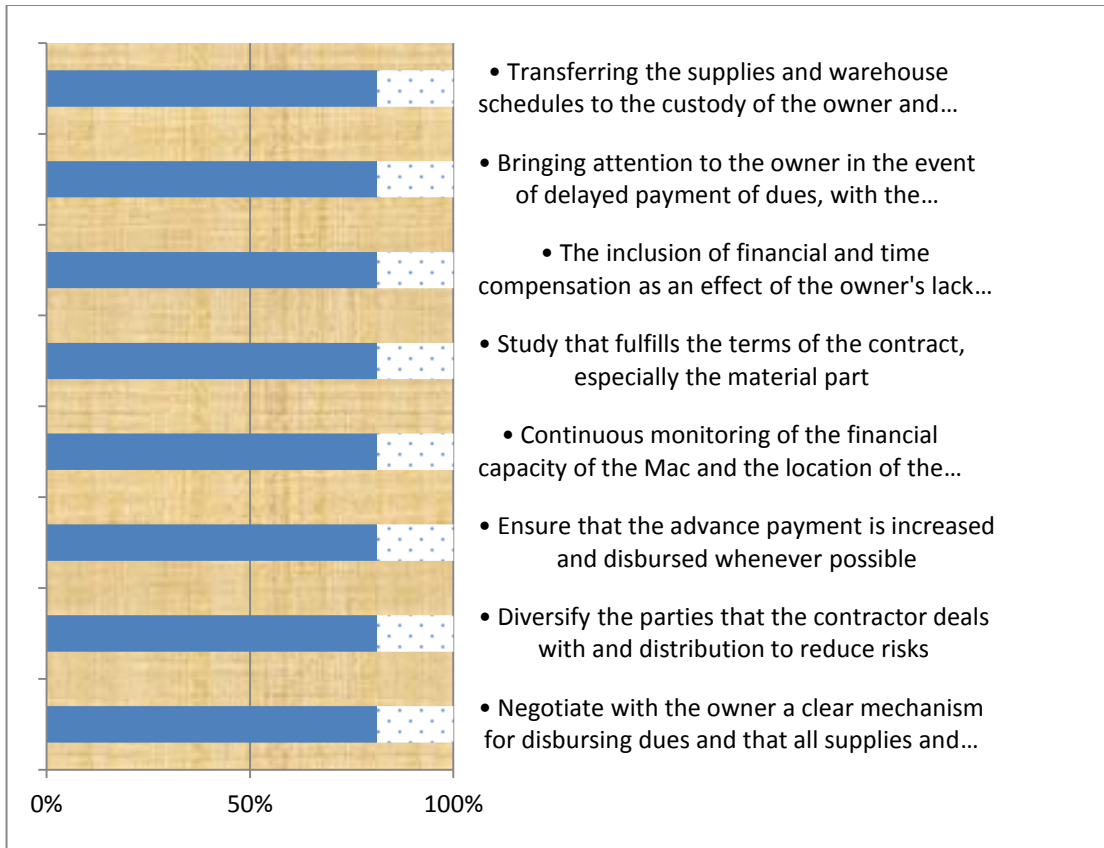


Figure (3-3) Illustrates the procedures that the contractor performs towards the owner

The aforementioned set of procedures may not alone reduce the negative effects of ill cash flow, but the contractor must also choose the parties he deals with carefully and ensure that the contract is balanced between two equal parties, The owner will not be able to implement his project without a contractor and the contractor will not find a project without owner

## Recommendations

The researcher recommends that the group of contractors in the Kingdom of Saudi Arabia as the research topic to activate the role of the Saudi Contractors Authority to play its role as a sponsor of contractors' rights and as a first responsible, to raise awareness among the dealers and those interested in the construction sector and strive hard to introduce laws that achieve balance between the owner and the contractor as equal contracting parties.

It also recommends that contractors, especially Medium-sized companies, establish specialized technical departments within their work to link the execution line with the cash flow line and undertake the development of plans for this purpose, follow-up and develop them.

It also recommends those in charge of the construction sector in general to look at the stability and rights-preservation of the situation in many developed countries as an effect of the strength of the contract and not the power and influence of one of the two parties, before bearing the burdens of the same burdens that they went through until reaching this stability

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