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ADAPTATION OF PROJECT FINANCE TO  
SMALL CONTRACTOR FINANCING

by

Ragunathan Venkateswaran

A Thesis  
Submitted to the  
Faculty of The Graduate College  
in partial fulfillment of the  
requirements for the  
Degree of Master of Science  
Department of Construction Engineering, Materials Engineering  
& Industrial Design

Western Michigan University  
Kalamazoo, Michigan  
December 2002

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2002

## ADAPTATION OF PROJECT FINANCE TO SMALL CONTRACTOR FINANCING

Ragunathan Venkateswaran, M.S.

Western Michigan University, 2002

One key reason for the poor performance of small construction establishments in securing a higher chunk of the annual project volume is funding. While construction industry does not require a large capital investment it does require a large working capital to start up the project and generate bills so that the resulting cash flow may take over the remaining funding requirements. Unfortunately for small contractors there are very limited options available from the banks or other lending institutions to cover this large working capital requirement in the absence of sufficient collateral. The “Project Finance” method, which has been used in some countries in different forms has been suggested in this thesis as the most effective method for small contractors in the United States.

The problems of small and start up contractors in funding their projects have been identified through literature review. The current financing practices were observed through interviewing three contractors and one bank in the Kalamazoo area and subsequently a model has been proposed using which a small start up company could seek higher growth. The growth rates that can be achieved using the project finance model in contrast with the traditional “line of credit” based growth rates have been empirically worked out using assumed data.

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## **Chapter 1: Funds related problems of the contracting industry**

### **1.1 Introduction**

Unlike most industrial projects, construction projects do not require a large start up capital; however they have their own peculiar problems. One of the most pressing problems being that of working capital and liquidity to support day to day activities. More construction companies go out of business due to lack of liquidity to support their day to day activities than due to lack of technical capability to do the job (Singh & Lakanathan, 1992). Over 10,000 construction firms failed in the United States in 1997, up from 8000 failures in 1990. The business failure rate for construction firms is about 30 percent higher than the national average for all industries (Schaufelberger 1999). Clearly among the various reasons for failure, financial reasons predominate. This thesis pursues the existing financial practices in the construction industry and proposes to adapt the project finance model for financing small and medium scale contractors.

### **1.2 Liquidity problem**

The problem of liquidity for a construction company is multidimensional and has internal and external factors that contribute to it. Some of the most common internal problems are poor cash flow prediction and multiple contracts undertaken simultaneously, which were not anticipated. Both of these internal factors coupled with an ill-structured progress measurement system can deliver a deathblow to any

construction company. To substantiate further, the existence of the cash management problem has been highlighted by several researchers. Navon (1996); Abudayyeh & Rasdorf (1993); Carr (1993); Cook (1991), have all dealt with the problem of cash flow or expense flow at various levels. While some have attempted to predict the cash flow by integrating the cost and schedule, others have generated mathematical models for forecasting the cash flow for a project.

### **1.3 Working capital problem**

While it is always possible to improve the accuracy of cash flow prediction by using such sophisticated methods referenced above, or other simpler approximation methods based on a well-structured progress measurement system. It is very difficult for a small company with limited resources to work on multiple simultaneous contracts due to the requirement of a large working capital and thus the contractors are restricted to the boundary established by the availability of liquidity or solvency. Lack of working capital is one of the most common causes for inhibiting the growth of a construction company. The 1992 census of the US Government “Census of construction industries” reported on the website [www.census.gov](http://www.census.gov), show the details given in Table-1;

The data in Table-1 clearly indicates that though there are a huge number of construction companies, only the large corporations who might have considerable financial strength are able to take up the bulk of the job, while smaller companies are handicapped on account of the need for working capital among other needs.

**Table 1 – Distribution of construction output among various types of construction related business establishments**

Type of business establishment	Percentage of the total number of construction establishments	Percentage of the total construction output in year 1992	Value of construction done in year 1992
Proprietorships	76%	12.57%	\$ 73.2 Billion
Corporations	20%	81%	\$ 471.42 Billion
Partnerships	3%	3%	\$ 17.46 Billion
Other	1%	3.42%	\$ 19.92 Billion

The total value of construction output in the year 1992 = \$ 582 billion.

Total number of construction establishments involved = 1.9 million

#### **1.4 Pace of growth**

Considering that the net income in the construction industry lies in the range of 5-7 % (BizStats, 2002), technically it is difficult to achieve a growth rate of more than 7 % (Bureau, 2002) on the turnover. Though traditionally construction contracting is seen as a high growth business, Schaufelberger (1999) quotes that one of the chief reasons for contractor failure is the pursuit of growth by volume. This points towards a limiting factor to the pace of growth. As pointed out by Rappaport (1986), growth should not be a goal but must be a consequence of a number of actions aimed at maximizing the NPV (Net present value). Donaldson (1984) reports on the pervasiveness of stating corporate

goals in terms of growth rates, implying that targeting a certain growth rate would require it's harmony along with other factors such as increase in assets, overheads, change in debt, change in equity etc. Donaldson has also pointed out that major industrial companies were very reluctant to use external equity as a regular part of their financial planning.

R.C.Higgins (1981), who pioneered the use of Sustainable growth as a tool of financial analysts says that Sustainable growth is that idealized growth rate which strikes a balance between a high growth rate and various factors such as increase in assets, change in equity etc as stated above. Bankers use this tool to quickly compare a company's actual growth rate to its Sustainable growth rate and thus predict the financial health of a company. If actual growth in volume of business consistently exceeds Sustainable growth, then management's problem will be 'Where to get the cash to finance the additional growth?' the banker in this case can anticipate interest earnings on loans. On the other hand if the Sustainable growth rate is greater than the actual growth then the company's problem will be 'What to do with the surplus cash and how to invest it'. Yet again if the actual growth rate far exceeds the Sustainable growth then this alerts the banker to the existence of a more fundamental problem in the company's financial planning and thus may desist from lending, (R.C.Higgins, 1981).

Construction industry forms an excellent cause for the application of the concept of sustainable growth as it is more dependent on cash flow and working capital as compared with other industries.

If we apply the concept of Sustainable growth to a typical hypothetical construction firm using national averages then we arrive at the following.

T = Average Sales to Assets ratio = 241% (Bizstats, 2002)

P = Average Profit margin = 6.3% (BizStats, 2002)

d = Average Dividend pay out ratio = 45% (UBS Warburg, 2002)

L = Average Debt equity ratio = 2.05 (BizStats, 2002)

$$\begin{aligned} \text{Sustainable growth rate} &= \left( \frac{P (1-d) (1+L)}{T - P (1-d) (1+L)} \right) \quad (\text{Corporate Finance, 1996}) \\ \text{Sustainable growth rate} &= \left( \frac{0.063(1-0.45) (1+2.05)}{2.41 - 0.063(1-0.45) (1+2.05)} \right) \\ &= 4.58 \% \end{aligned}$$

This is lower than the industry average of actual growth rate seen from census material referenced above, which stands at 7%. It thus becomes obvious that having a higher growth rate than what their internal financial arrangement can sustain, contractors are constantly on the look out for funds to finance the additional growth.

### 1.5 Liabilities of a new company

Further substantiation for the need to have a high and at the same time Sustained growth lies in the research of David Arditi & Serdar Kale (1998) regarding the “Liability of newness, adolescence & smallness in the construction industry. By analyzing the age distribution of failed construction companies and computing age specific failure probabilities over a 10-year period, 1985 through 1994, their research findings support the liability of adolescence concept. The duration of which is said to be between 3 to 4

years and lies in the region of increasing risk on the graph (Fig-1). According to them failure risk in the US construction industry increases initially with increasing age, reaches a peak point and decreases thereafter as companies grow older. This bell curve however is spread over a period of 10 years indicating it's relevance to the need for sustainable growth and an appropriate financial model to sustain it long enough to overcome the aforesaid liabilities.

#### 1.51 Liability of newness:

The liability of newness as the name implies, pertains to the disadvantages of being a new company. It is addressed with respect to the internal and external environments of the new company. The external environment relates to the processes that are external to the organization such as establishing stable exchange relationships with clients, creditors, suppliers & other organizations. It often requires a special effort. According to Singh et al (1986), establishing stable exchange relations with clients, creditors and suppliers protects the organization from competitive pressures creating organizational buffers. The internal environment is related to processes that are internal to the organization, such as learning and inventing new roles, developing trust and co-operation among organizational members. Organizations overcome the liability of newness by accumulating and leveraging organizational learning, Burgelman (1991). An organization's average performance improves and the variation in its performance declines as the organization gains experience when its goals are institutionalized and its activities are routinized. The above processes result in decline in the probability of failure. The lack of organizational legitimacy and learning increases the probability of failure of newly established organizations.

### 1.52 Liability of adolescence:

The liability of newness hypothesis has been challenged in the works of Fichman and Levinthal (1991) and Bruderl and Schussler (1990) in their proposed liability of adolescence hypothesis. According to them the risk of failure increases in the initial stages of a company's life, reaches a peak and gradually declines thereafter. As a newly started organization is likely to have an initial stock of assets, trust, good will and financial resources and positive beliefs, the failure risk is offset at the outset of the company's operations. Towards the end of the company's first project whereupon the decision-makers are likely to judge the company's performance, the failure risk increases drastically. On successful completion of a project the risk decreases and tapers off to normal industry level risk for the given nature of the company. This is depicted in Fig-1

The aggregate pattern for many such individual organizations is likely to be an approximate bell shaped curve as different start ups will be endowed with different resources and performance criteria and also different decision makers may rely on different sets of information to judge success or failure.

### 1.53 Liability of smallness:

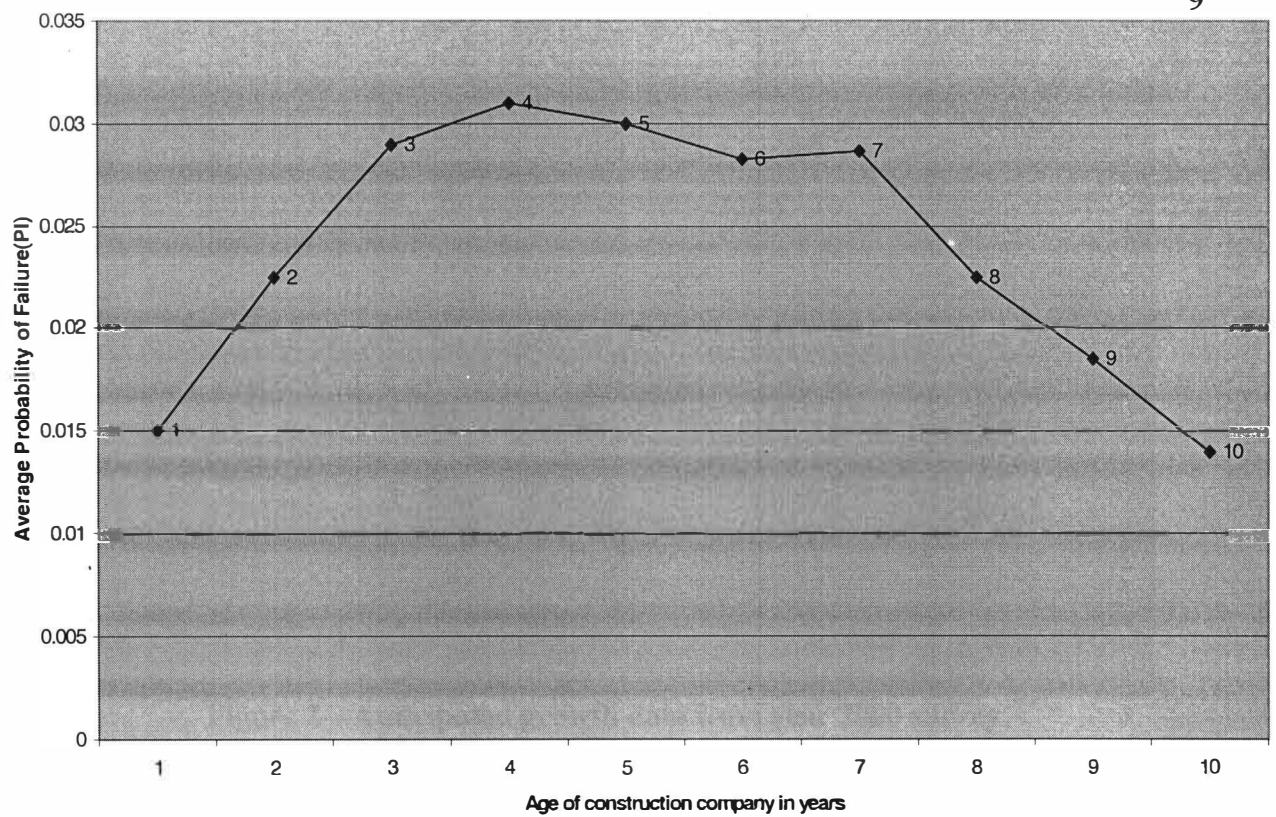
The size of an organization influences its chances of survival. According to Aldrich and Auster, (1986), small size makes survival problematic. Though not all organizations are born small, more often than not, smallness is coupled with newness. The liability of smallness emerges from the lack of financial resources and lack of strong financial support from creditors. Smallness does not allow firms to buffer themselves from market contractions. Added to the above are managerial weaknesses, operational

weaknesses, limited access to necessary information and difficulty in attracting qualified and competent personnel that contribute to the liability of smallness.

### **1.6 Unplanned growth and unpredictable funds requirement**

An additional problem regarding unplanned growth has come to light in the year 2000 survey of CFMA (Construction Finance Managers Association). According to their survey results available on their web site [www.cfma.org](http://www.cfma.org) and depicted in Fig 2 & Fig 3 in the ensuing pages; 65% of all the contractors interviewed anticipate growth in their business volumes but only 25 % of all contractors interviewed believe that their growth in volumes was going to be a product of planned regional growth. This implies that a contractor cannot predict the precise time period when his firm is going to need the working capital, it can be as early as a couple of weeks or can be as late as a year. Normally with a longer lead-time it is easier to arrange finance while it is very difficult to arrange finance at short notice. Keeping the above in perspective, it would entail lenders or bankers to have a method of ascertaining the contractor's capability for such projects quickly, investigate the credit worthiness of the owners and lend according to the need for such projects.





**Figure 1- Business failure probabilities by specific age**  
Source : Kale and Arditi (1998)

### ***Economy and Competition***

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#### **Expectation of Volumes**

	<u>2000</u>	<u>1995</u>
- Growth anticipated in next year's volume	65%	55%
- Decline anticipated in next year's volume	11%	17%
- No change expected in next year's volume	25%	28%

**Figure 2 – Anticipated growth data from year 2000 survey**

Source : [www.cfma.org](http://www.cfma.org)

### ***Economy and Competition***

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#### **Planned Regional Growth**

	<u>2000</u>	<u>1995</u>
Yes	24%	27%
No	76%	73%

**Figure 3 – Planned growth data from year 2000 survey**

Source: [www.cfma.org](http://www.cfma.org)

## 1.7 Changing trend of project delivery methods

A construction project is more often than not, the most expensive phase of any project as it involves asset creation for the project owners. On account of weaknesses observed among most project delivery systems, there has been a large shift towards the “Design-Build” project delivery method among owners across various industry sectors. Fig 4 which is based on a survey by the Design-Build institute of America shows the increase in the popularity of the Design-Build system vis-à-vis other systems such as the Design-Bid-Build or the Construction management at-risk methodology. As always, every system has its own pros and cons and with DB the major advantage to the owner is transfer of risk; while it is a profitable methodology for competent contractors, it places a constraint on the competent but financially not very strong contractors. This comes about due to the large amount of up front money required to get the cash flow going. Since material supply and installation are both the responsibilities of the Design Build form of contracts, the expense flows are huge and securing low cost on supplies is not easy if one has to also secure credit from one’s suppliers. This situation entails that the contractor pay up his supplier before he gets paid by the client in order to secure a good price from the supplier, which in turn means that the contractor needs to have huge resources.

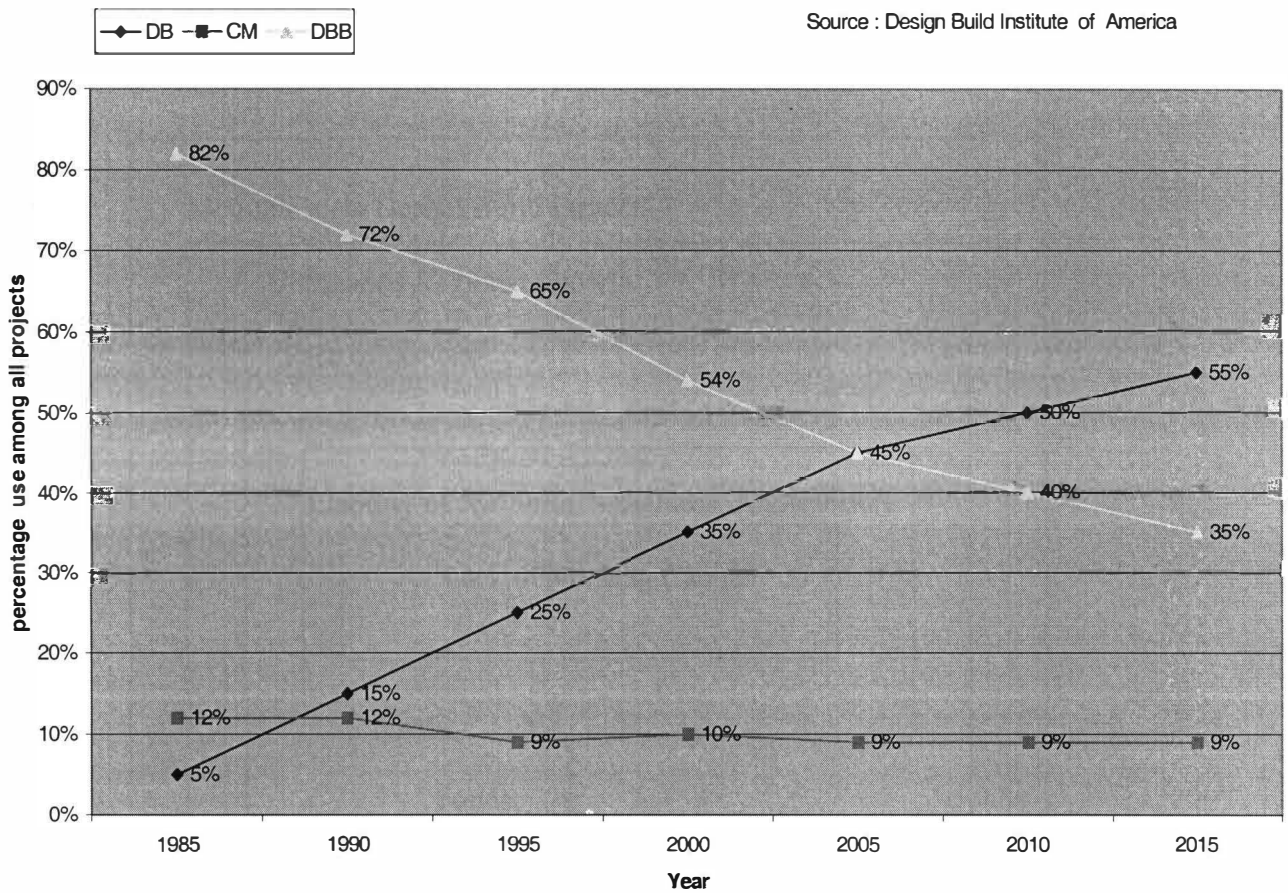
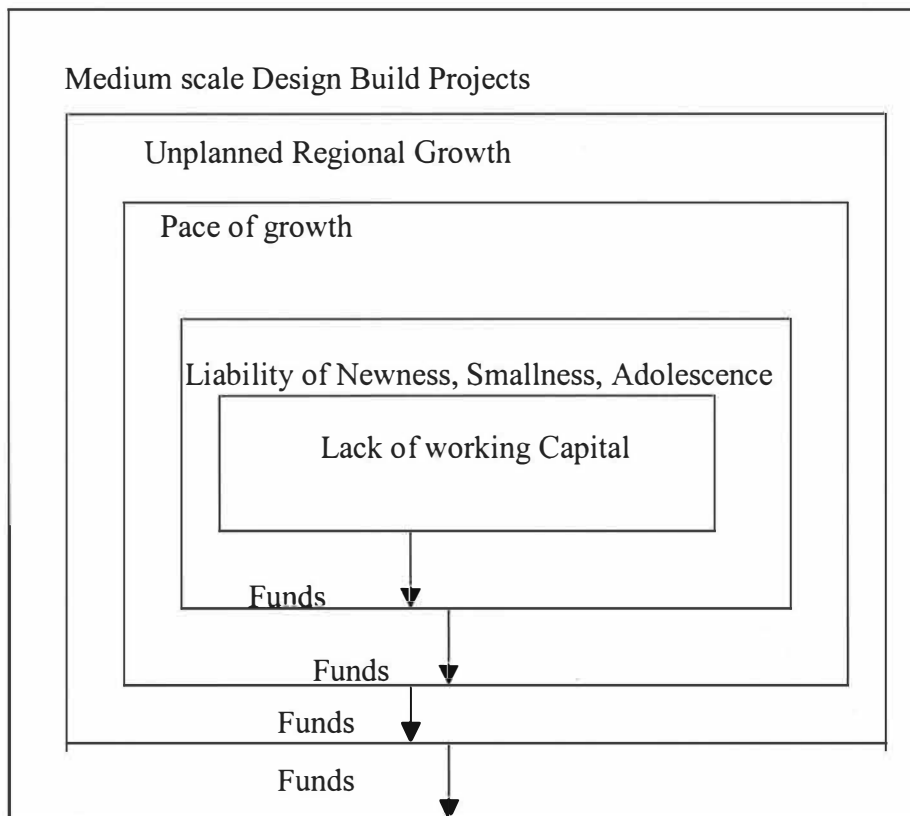


Figure 4 -Project delivery systems under use & future trend

### 1.8 The problem conclusion

The various funds related problems that contractors have and which have a direct impact on their growth can be summarized in the below given chart.



**Figure 5 - Sequence of funds related problems for contractors**

The funds problem for a new construction firm starts after the firm has learnt to handle the cash flow for its projects without any problem. There after a need for working capital is perceived in order to bid and execute multiple projects simultaneously. During the

period of adolescence, which is a period of up to 4 years from start up, funds may be required to juggle between a number of cash flows, due to the lack of credit support from suppliers. After the period of adolescence when the firm has reasonably stabilized and is aiming for higher growth, yet again there is a requirement for greater amount of funds. Unplanned growth and consequent excessive bidding and accepting orders results in a severe strain on the company's finances. The design-build methodology for project execution is highly capital intensive and in the face of fierce competition, low margins stretch the company's finances to the limit. This perpetual need for funds to fuel growth calls for a project specific financing mechanism.

## **Chapter 2: Various financing methods**

### **2.1 Construction financing**

The construction loan is the first institutional quality loan involved in a development project. It may involve the funding of development costs or may be restricted to funding the actual construction of the structure. While there are a number of players in the construction loan lending business, it is always a short-term loan and is meant to be replaced with permanent financing at the end of construction. A commitment from a permanent financing source at times may be a pre-requisite for a construction lender to disburse any of the loan amounts. On the other hand there may be instances such as residential apartment complexes, which may hardly require permanent financing to be tied up with the construction loan spectrum. Refer Fig 6 for the graphical representation of the construction financing arrangement. The main drawback of this kind of loan from a construction contractor's perspective is that it is not available for a contractor and is available only to the developer or the owner of the project and is issued strictly against availability of collateral.

### **2.2 Permanent financing**

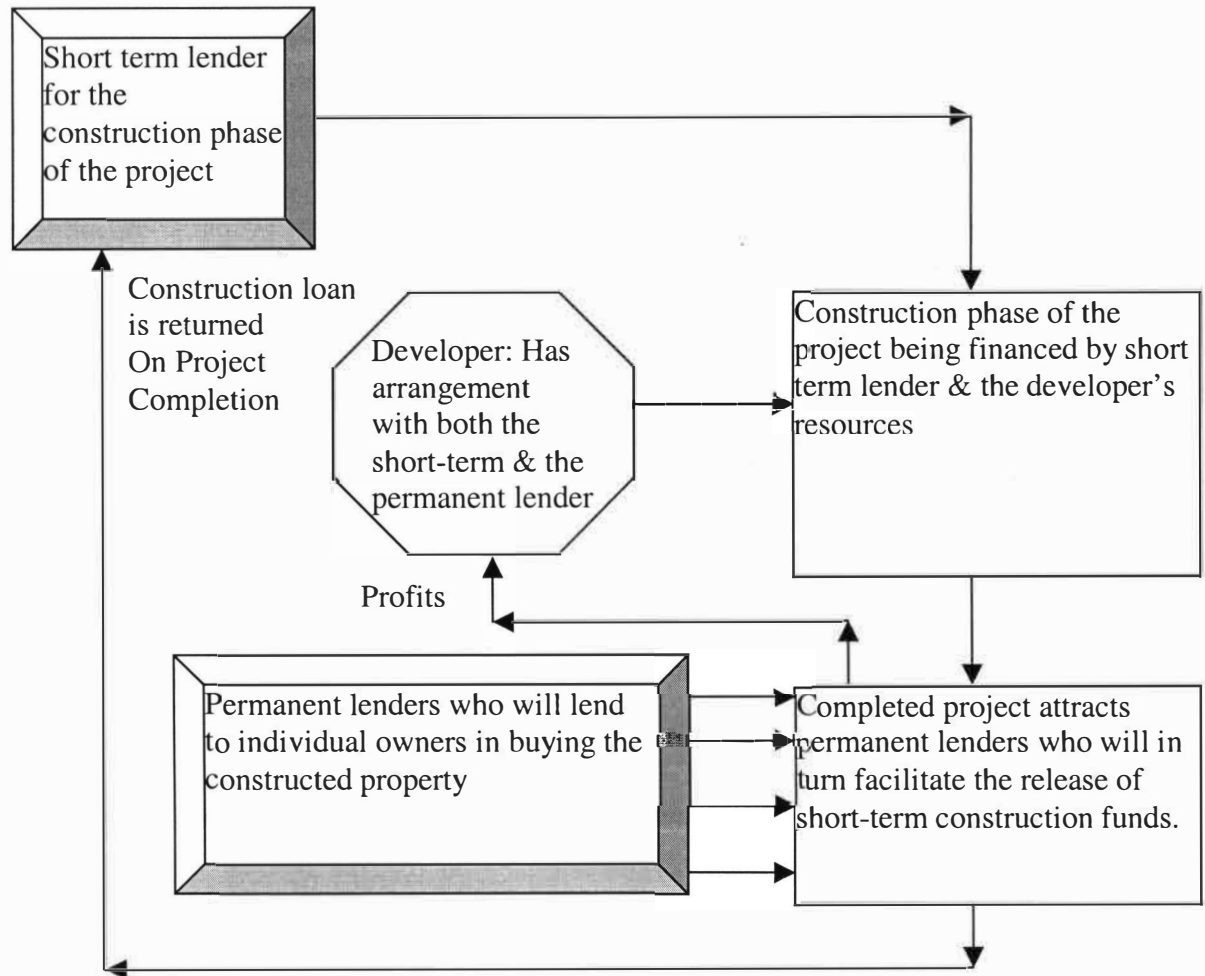
Permanent financing is usually drawn by the end user of the property, which in the case of residential apartments might be the apartment owner. Permanent financing is also a misnomer in that, although amortized for 25 to 30 years, has a term of just 10 years

which means that the loan is to be owned for a period not greater than 10 years. There are many reasons cited for the term of permanent financing to be shorter than the amortization period, some of them being:

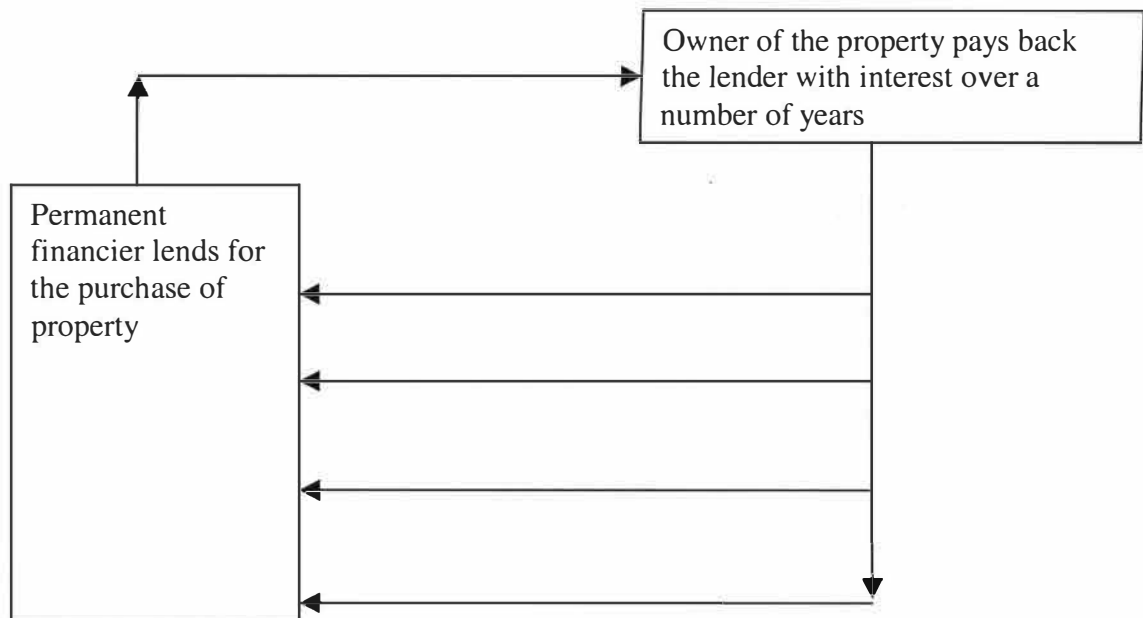
- a) Lenders wish to avoid lending too far into a distant uncertain future.
- b) Borrowers often expect the value of their properties to appreciate and expect to refinance at periodic intervals to gain tax-free capital.
- c) Owners intend to sell within a ten-year period and are aware that new owners expect to refinance their properties anyway. ( Collier, Collier and Halperin,2002 )

These types of loans are available only for the purchase of a property and not for development or construction of the property. Refer Fig-7 for the graphical representation of a permanent finance arrangement.





**Figure 6 – Illustration of a construction finance arrangement**



**Figure 7 – Illustration of a permanent finance arrangement**

### **2.3 Commercial mortgage backed securities (CMBS) or conduit loans**

Conduit loans constitute a specialized form of mortgage banking that has emerged as a major source of real estate lending in the recent years. Institutions bundle hundreds of separate real estate loans together and use them as collateral for a bond offering, which is sold on ‘Wall Street’. They are called as conduit loans as lenders are acting as conduits between the real estate market and ‘Wall Street’.

Lenders strive to use uniform documents and common underwriting standards to decrease the complexity of the loan packages and thus achieve greater marketability of the

resulting offering. Conduit loans are non-recourse loans meaning that, in case of default, the lender to the bond offering institution can only look to the repayment of the original loan taken to purchase the real estate. Though some liability does exist for the borrower for example fraud in application, failure to pay income tax or insurance, misapplication of rent, environmental transgressions and so on, by and large a conduit loan benefits the bond offering institutions.

## **2.4 Mortgage**

This is perhaps the oldest form of financing known to mankind ever since non-perishable items started to have value. Mortgage financing is a system wherein a builder or a contractor mortgages his illiquid asset or real estate property, in other words places it in trust with a financing company in return for liquid money or cash to run his operations. This may be a short-term arrangement or a long term one. The said property is offered as collateral security against the borrowing and the lender depending upon the nature of the asset may advance the entire value of the asset in cash or may advance a portion of the asset value in cash. This is done in order to cover any incidental costs arising out of need to liquidate the said property. The borrower on the other hand pays interest on the borrowed money and agrees upon a repayment schedule for the capital. On complete repayment of the loan, the ownership of the property reverts back to the borrower.

## **2.5 Refinancing**

Sometimes a construction firm wants to undertake a large project and finds that even though it has sufficient equipment, skilled labor and know-how, it can't take the work because it lacks liquidity or cash. Such situations hold a potential for refinancing some of its old real estate assets to take advantage of the increased real estate value. For instance assume that 10 years ago the firm had property worth \$1 million and took out a first mortgage for 80% of that value or \$ 800,000. Today assume that the property has increased in its value to \$ 2 million and at an 80% loan-to-asset ratio would be eligible for a loan of \$1.6 million (Collier and Halperin, 1984). Meanwhile the old loan has been paid off until the principal balance is only \$ 600,000. Thus the firm could borrow \$ 1.6 million and simultaneously pay off the \$ 600,000 principal balance of the earlier loan and have \$1 million of the new borrowed money. The single largest advantage of such a transaction is that the \$ 1 million that would flow in is tax free dollars, since the money is borrowed money and is not derived from earnings in any way. These \$1 million though will have to be repaid to the lenders with interest, is better than taking a corporate loan as the interest rates on real estate mortgages are cheaper than most other kinds of loans.

## **2.6 Transaction loans**

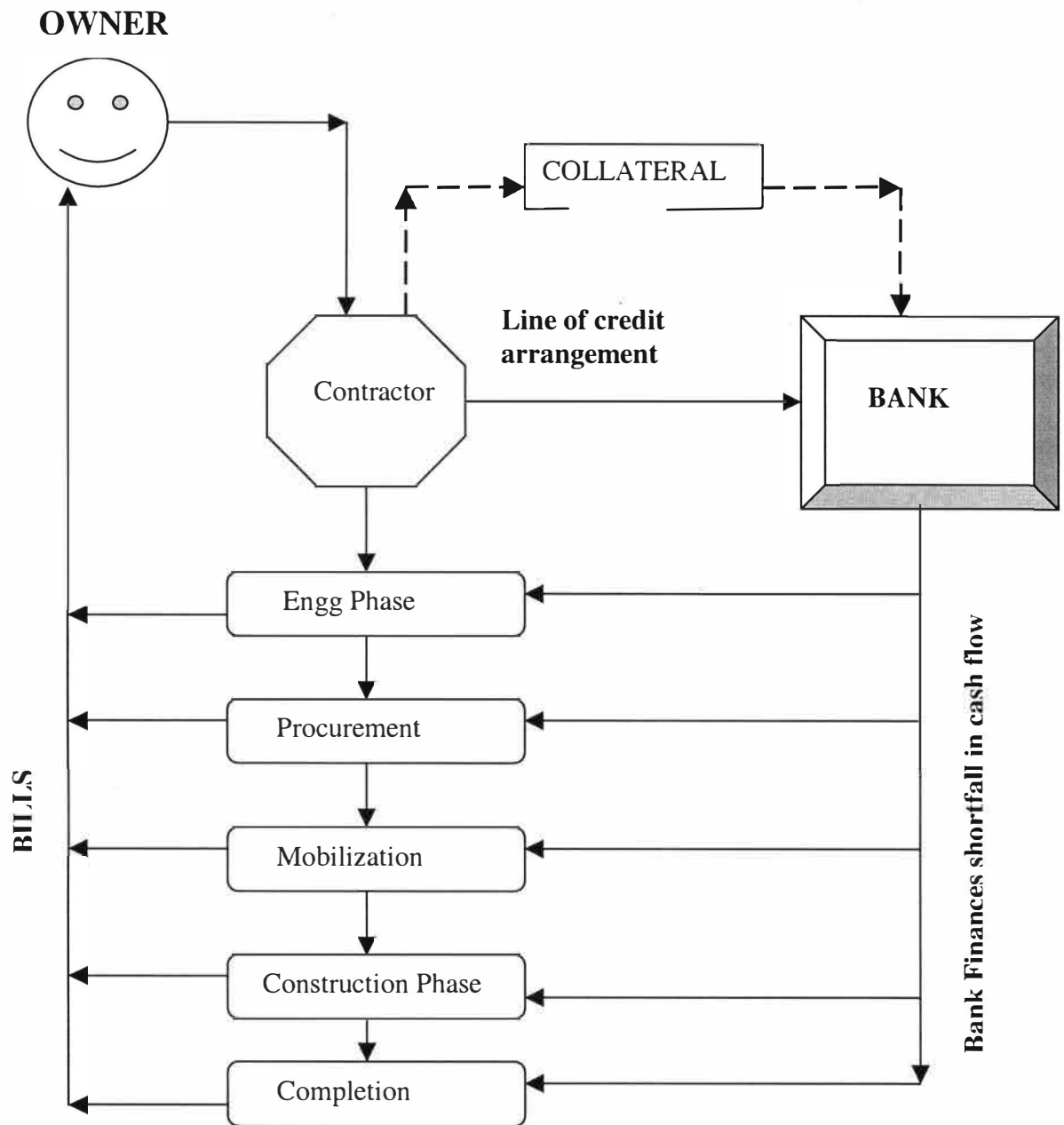
Transaction loans for a part of working capital might be used to meet a construction company's payroll or pay taxes, and are generally short-term loans. They mature in 60 – 90 days and are normally expected to be paid off within a year.

Transaction loans are advanced for a specific transaction and are not made under a pre-arranged line of credit or other type of credit arrangement. Examples of transaction loans

would be a bid check loan, which is used by a contractor when he borrows money to purchase a bid deposit check at the time the contractor is submitting his bid to the owner. The check is returned to the contractor if he is not the successful bidder, or if he is the successful bidder the check is returned to the contractor when he furnishes the performance bond. Normally a transaction loan is made by a bank to an existing client based on the receivables of the contractor in the immediate future and does not mandate collateral.

## **2.7 Line of credit**

This is the most common form of short-term debt entertained by the construction industry and contractors in particular. A line of credit is a credit either extended to the existing accounts of the company or offered through a separate bank account which is used by the contractor to service his expenses and is funded by the bank or the lender. Upon receipt of payment from the client the money borrowed from the lender is returned to the same account by deposit. The period of time for which the money was lent is chargeable for interest and the rate varies depending upon the lender and the current economic scenario. There is a limit to the amount of money that can be drawn from this line of credit account. It is normally equivalent to, or less than the value of security offered to the bank, by way of showing assets as collateral or by securitizing with stock or other forms of promissory notes. Refer Fig-8 for a working arrangement of this method of financing for a contractor.



**Figure 8 – Illustration of the ‘Line of Credit’ mechanism**

## **Chapter 3: Introduction to project finance**

### **3.1 Introduction**

According to John D Finnerty, (1996), a leading expert in Project Finance, the use of Project finance is a well-established technique for large capital intensive projects. It's origins can be traced to the thirteenth century when the English crown negotiated a loan from the Frescobaldi, one of the leading merchant bankers of the period, to develop the Devon silver mines. They crafted a loan arrangement much like what we would call a production payment loan today; (John D Finnerty, 1996). A great variety of investments have since been financed including pipelines, refineries, electric power generating facilities, hydroelectric projects, dock facilities, mines, mineral processing facilities and many others. Project finance experienced resurgence in the 1980s when it was used frequently to finance co-generation and other forms of power production. Chen et al (1989) documented more than \$23 billion worth of project financing between the first quarter of 1987 and the third quarter of 1989. They identified more than 168 projects financed on this basis including 102 involving co-generation and other forms of power production. Project finance is being realized to hold great promise as a means to finance the enormous infrastructure needs that exist in the developing countries and especially in the developing markets.

Project finance is a non recourse type, asset based financing of an economically separable capital investment project in which the lenders look primarily to the cash flow from the

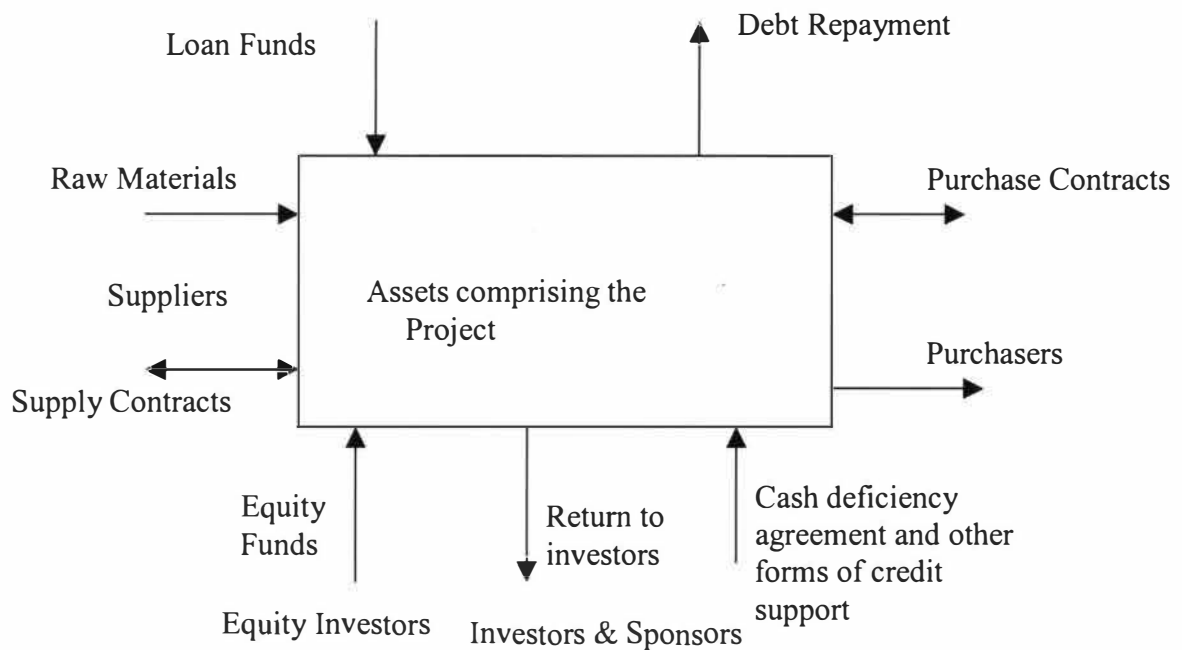
project as their source of funds to service their loans and provide a return on their equity invested in the project.

The distinguishing feature of project financing from conventional financing is that unlike conventional financing the lenders do not have recourse to the entire portfolio of assets of the project sponsor, instead rely only upon the cash flow of that specific project. It becomes possible for the lenders to take on high risk in Project financing due to a detailed risk analysis and transfer carried out by the project sponsor, besides substantial and steady gain for a long period of time. Such is the nature of a pure form of non-recourse project financing. However variants of this form do exist in models wherein the lenders have a limited recourse to the asset portfolio of the project sponsor. In any project finance model the terms of the debt and equity securities are tailored to the cash flow characteristics of the project. For their security, the project debt securities depend at least partly, on the profitability of the project and on the collateral value of the project's assets.

### **3.2 Elements of project finance**

A Project finance arrangement could have a number of entities financing the project such as lenders, equity investors, purchasers, material suppliers and other credit support entities. Shown in Fig-9 is a rudimentary working mechanism of a typical project finance arrangement. The lenders, equity investors, material suppliers etc invest initial money required to create the asset and in return receive either interest on money lent, dividends on equity, preferred purchase agreements, lucrative sales agreements or other forms of compensation from the revenues of the operational asset. The returns to any





**Figure 9- Basic elements of a project based capital investment**

single investor would reflect the risk level his investment faces and is clearly spelt out in legally binding contractual agreements.

Project financing can be beneficial to a company with a proposed project when,

- (a) The project's output would be in such strong demand that purchasers would be willing to enter into long term purchase contracts
- (b) The contracts would have strong enough provisions to safeguard the investment that Banks would be willing to advance funds to finance on the basis of the contracts. It is this aspect of project finance that we will be using in developing the model for Construction projects.

Further there are a number of advantages and disadvantages that Project financing has over conventional direct financing, most of which have been illustrated in Table-2 below.

### 3.3 Comparison of Direct and Project Financing

**Table 2 -Comparison of Direct and Project financing (John. D Finnerty, 1996)**

<b>Criterion</b>	<b>Direct Financing</b>	<b>Project Financing</b>
Organization	<ul style="list-style-type: none"> <li>• Large businesses are usually organized in corporate form.</li> <li>• Cash flows from different assets and businesses are co-mingled</li> </ul>	<ul style="list-style-type: none"> <li>• The project can be organized as a partnership or limited liability company to utilize more efficiently the tax benefits of ownership.</li> <li>• Project-related assets and cash flows are segregated from the sponsor's other activities.</li> </ul>
Control & monitoring	<ul style="list-style-type: none"> <li>• Control is vested primarily in management</li> <li>• Board of directors monitor corporate performance on behalf of the shareholders.</li> <li>• Investors do limited direct monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>• Management remains in control but is subject to closer monitoring than in a typical corporation.</li> <li>• Segregation of assets and cash flows facilitates greater accountability to investors</li> <li>• Contractual arrangements governing the debt and equity investments contain covenants and other provisions that facilitate monitoring.</li> </ul>

Allocation of risk	<ul style="list-style-type: none"> <li>• Creditors have full recourse to the project sponsor.</li> <li>• Risks are diversified across the sponsor's portfolio of assets.</li> <li>• Certain risks can be transferred to others by purchasing insurance, engaging in hedging activities, and so on.</li> </ul>	<ul style="list-style-type: none"> <li>• Creditors typically have limited recourse – and in some cases, no recourse- to the project sponsors.</li> <li>• Creditors' financial exposure is project specific, although supplemental credit support arrangements can at least partially offset this risk exposure.</li> <li>• Contractual arrangements redistribute project related risks</li> <li>• Project risks can be allocated among the parties who are best able to bear them.</li> </ul>
Financial flexibility	<ul style="list-style-type: none"> <li>• Financing can typically be arranged quickly.</li> <li>• Internally generated funds can be used to finance other projects by passing the discipline of the capital market.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher information, contracting, and transaction costs are involved.</li> <li>• Financing arrangements are highly structured and very time consuming.</li> <li>• Internally generated cash flow can be reserved for proprietary projects.</li> </ul>
Free cash flow	<ul style="list-style-type: none"> <li>• Managers have broad discretion regarding the allocation of free cash flow between dividends</li> </ul>	<ul style="list-style-type: none"> <li>• Managers have limited discretion.</li> <li>• By contract, free cash flow must be distributed to equity investors.</li> </ul>

Agency costs	<p>and reinvestment</p> <ul style="list-style-type: none"> <li>• Cash flows are commingled and then allocated in accordance with corporate policy.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Equity investors are exposed to the agency costs of free cash flow.</li> <li>• Making management incentives project specific is more difficult.</li> <li>• Agency costs are greater than for project financing.</li> </ul>	<ul style="list-style-type: none"> <li>• The agency costs of free cash flow are reduced.</li> <li>• Management incentives can be tied to project performance.</li> <li>• Closer monitoring by investors is facilitated.</li> <li>• The under investment problem can be mitigated.</li> <li>• Agency costs are lower than for internal financing</li> </ul>
Structure of debt contracts	<ul style="list-style-type: none"> <li>• Creditors look to the sponsor's entire asset portfolio for their debt service.</li> <li>• Typically, debt is unsecured (when the borrower is a large corporation).</li> </ul>	<ul style="list-style-type: none"> <li>• Creditors look to a specific asset or pool of assets for their debt or service.</li> <li>• Typically, debt is unsecured.</li> <li>• Debt contracts are tailored to the specific characteristics of the project.</li> </ul>
Debt capacity	<ul style="list-style-type: none"> <li>• Debt financing uses part of the sponsor's debt capacity.</li> </ul>	<ul style="list-style-type: none"> <li>• Credit support from other sources, such as purchasers of project output, can be channeled to support project borrowings.</li> </ul>

Bankruptcy	<ul style="list-style-type: none"> <li>• Costly and time consuming financial distress can be avoided.</li> <li>• Lenders have the benefit of the sponsor's entire asset portfolio.</li> <li>• Difficulties in one key line of business could drain cash from "good" projects.</li> </ul>	<ul style="list-style-type: none"> <li>• The sponsor's debt capacity can be effectively expanded.</li> <li>• Higher leverage (which provides valuable interest tax shields) than the sponsor would feel comfortable with if it is financed the project directly can be achieved.</li> <li>• The cost of resolving financial distress is lower.</li> <li>• The project can be insulated from the sponsor's possible bankruptcy.</li> <li>• Lender's chances of recovering principal are more limited; the debt is generally not repayable from the proceeds of other unrelated projects.</li> </ul>
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### 3.4 The project financing process

If there are any reasons attributable to the relatively low popularity of project finance, the project finance process is certainly one. Known for its complex and lengthy process, the project finance model has come to be used only in situations absolutely necessitating it. Following is a brief overview of the various aspects of the process.

### 3.41 Project Viability Study

Securing lenders who are willing to lend with out recourse to the liquid or illiquid assets across a sponsoring company's portfolio is easier said than done. Normally the lenders require an extensive study of the technical feasibility, economical viability, adequacy of raw materials supplies, creditworthiness and extensive risk analysis and transfer. Some of the major risks that are assessed in the financing of a power project are: (a) completion risk, (b) technological risk, (c) economical risk, (d) financial risk, (e) raw material supply risk, (f) product take off risk, (g) currency risk, (h) political risk, (i) environmental risk, (j) force majeure risk etc.

### 3.42 Contractual agreements & security arrangements

Generally investors and lenders who provide the bulk of capital for a project are only interested in receiving a certain return on their financial investment. While they are often prepared to bear certain credit risks they are extremely reluctant to bear significant operating risks. Consequently project financing entails developing an extensive network of security arrangements designed to protect investors from non-credit risk. Some of such security arrangements include: (a) direct security interest in project facilities, usually in the form of first mortgage lien on all project facilities, (b) security arrangements for completion of construction phase which involves the obligation to complete the project in all respects or repay all project debt, (c) security arrangement covering debt service which entail legal provisions which mandate the service of the debt as the first priority from the revenues of the project, (d) security arrangements

covering the purchase of sale and products and (e) supplemental credit support in order to shore up the debt service obligations in the event that the project fails to provide the projected cash flow. (Finnerty, 1996)

### 3.43 Legal structure

A critical aspect that project sponsors should address in the planning stage of the project is “Should a project financing entity be employed at all” and if so how should it be organized. The appropriate legal structure for a project depends on a variety of business, legal, accounting, tax and regulatory factors including: 1) the number of participants and the business objectives of each of the participant, 2) project’s capital cost and anticipated earning patterns of the project. 3) Requirements of regulatory bodies, 4) existing debt instruments and the tax positions of participants, 5) political jurisdictions in which the project will operate. Based on the above and many other factors which may be project specific, a number of company organizations like: a) undivided joint interest, b) corporation, c) partnership or d) limited liability company may be chosen. Each of the organizations may attract different tax laws and the most suitable among them would have to be selected.

### 3.44 Preparing a financing plan

Designing an optimal financing plan for a project generally involves meeting six principal objectives: 1) ensuring the availability of sufficient financial resources to complete the project, 2) securing the necessary funds at the lowest practicable cost, 3) minimizing the project sponsor’s credit exposure to the project, 4) establishing a dividend policy that maximizes the rate of return on the

project sponsor's equity subject to constraints imposed by lenders and the cash flow generated by the project, 5) maximizing the value of tax benefits of ownership to which the project will give rise and 6) achieving the most beneficial regulatory treatment.

Often these objectives may not be perfectly compatible and result in trade-off. In general the lowest cost of capital is achieved when a) debt is maximized as a percentage of total capitalization and b) the amortization schedule for the project debt is matched, as closely as the capital market will permit, to the cash flows of the project. (Finnerty, 1996)

### 3.45 Financial modeling & analysis

The most important and decisive aspect in the project finance process is the financial modeling. The modeling mandates cash flow projection, projected financial statements, project debt capacity, measuring expected rate of return, NPV (Net present value) analysis, IRR (Internal rate of return) analysis & Sensitivity analysis. While, description even with fair amount of details of the various above processes is well beyond the scope of this thesis, it should suffice to say that extensive financial modeling & analysis is carried out by the project sponsors as a part of the financing process

### 3.46 Sources of funds

Depending upon the size of the project and the fund requirement, a number of sources of funds can be tapped. The project sponsors are normally the largest holders of initial project equity. Often the purchasers of the product output are also required to invest equity in the project in order to secure their firm



need. The total fund requirement for a larger project other than the initial equity requirement is raised through commercial banks and life insurance companies. The asset creation phase of the project is financed by short term construction loans funded by banks which are often refinanced by a permanent long term lender at the completion of the project. The long term lending, which was traditionally the forte of insurance companies, has of late become the area of interest for commercial banks. Apart from these the various sources of funds are: (a) pooled equity vehicles, (b) committed investment funds, (c) long term debt market, (d) international commercial banks, (e) World Bank, (f) life insurance companies, (g) quasi public market, (h) public pension funds, (i) international capital market, (j) supplier credits, (k) export credit financing, (l) loan guarantees etc. (Finnerty, 1996)

### 3.47 Issues for international projects

Project financing for an international project is perhaps the most complicated of all projects financing due to the huge political risk involved. This, apart, one would have to consider the economic development that can be affected for the host country and the expected economic return for the host country's jurisdiction. The impact of availability of hard currency from the project operations would have to be carefully studied and safe guards put in place to secure the servicing of debt of the international equity investors. The issuance of a guarantee as a form of financial support for the project which will bring down the cost of funds will have to be scrutinized further as the capacity of the host country to issue further debt reduces and this may jeopardize its other commitments.

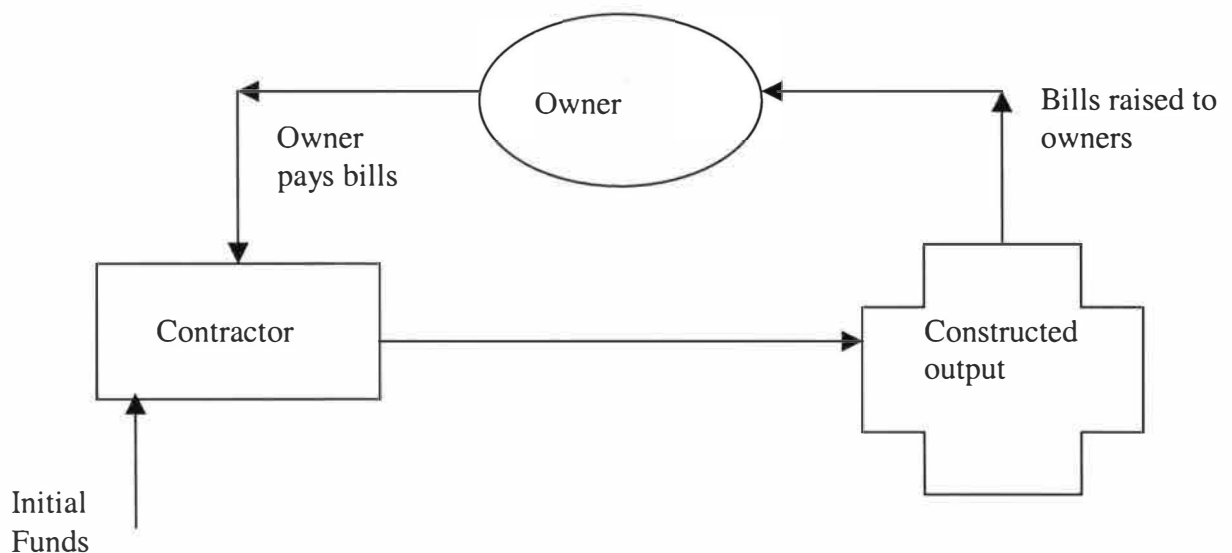
### 3.48 Involvement of vendors and contractors in project finance

Research by Carl et al (1991) indicates that lack of secondary market for project finance instruments limits investor's liquidity and ability of vendors and contractors to participate in project finance. Contractors and vendors participate in traditional project financed Mega-projects by way of providing goods and services by 'subordinated debt' with the intent of unwinding in the post completion financial restructuring. In most cases contractors subordinate the debt as they can ill afford a lack of liquidity. A fine example of one such instance is the unwinding of investment by DODSAL Pte in their Dahej-Gandhar-Baroda pipeline in India which was built on a BOOT basis and in which the researcher was personally involved in the capacity of a 'Project Engineer'.

## Chapter 4: Methodology of study

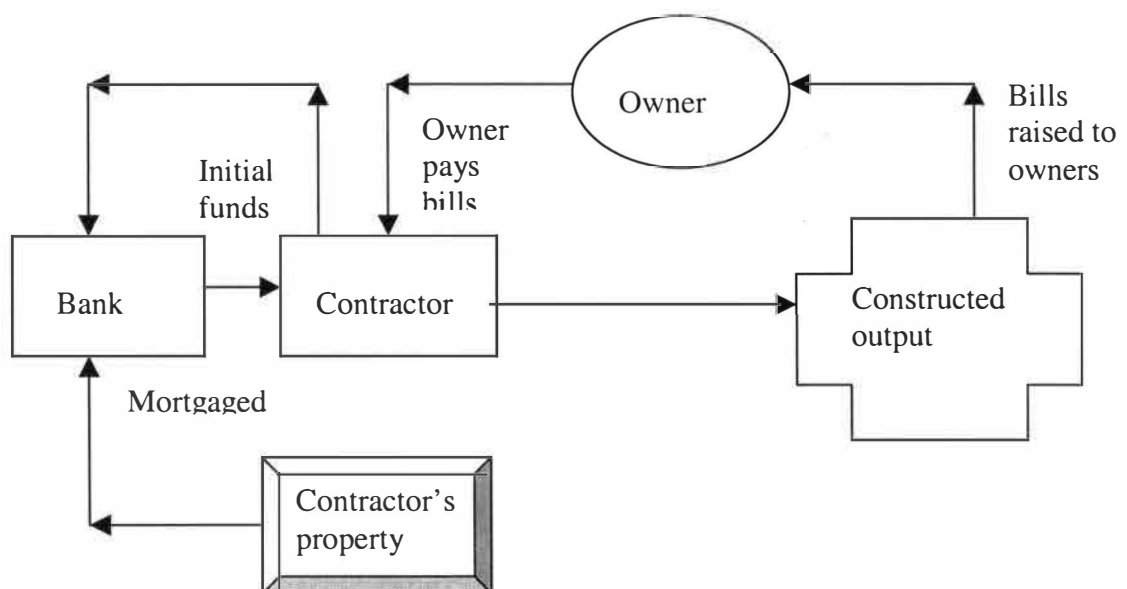
### 4.1 Suitability of various financing methods

We have seen from the previous pages that one of the fundamental problems underlying various finance and cash flow related problems for a contractor is the mobilization of funds to execute a given project. The nature of activity of a contractor is such that the contractor has to produce some significant constructed output by investing in the project in order to raise a bill and be paid by the owner thus putting in motion the cash flow, which will sustain the project to completion. The arrangement is shown in Fig-10 below.



**Figure 10 – Typical cash flow arrangement**

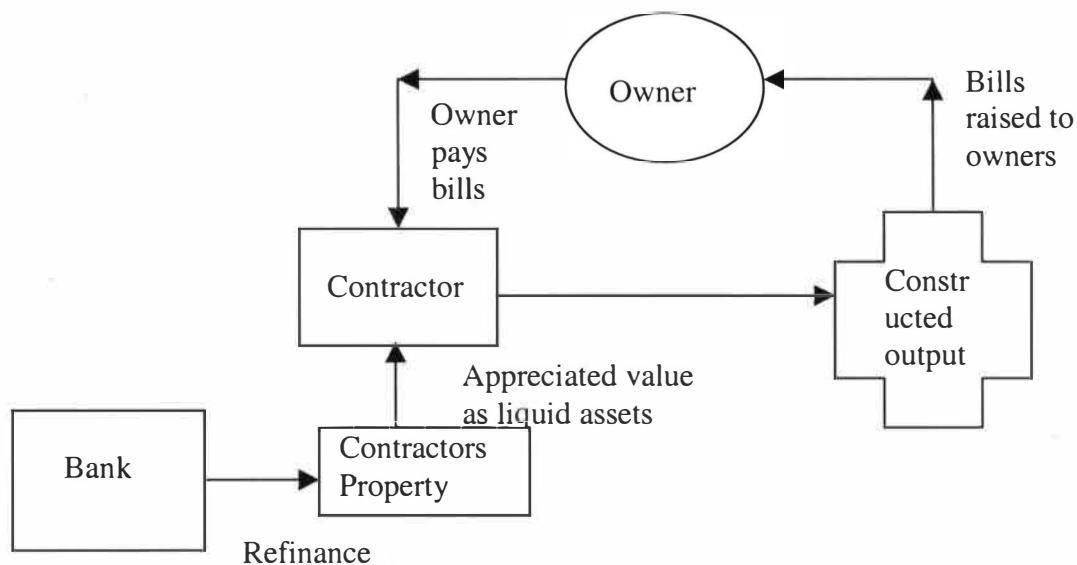
The nature of the above operation discounts the use of construction finance for the contractor as the contractor is not the project owner here and it is only the owner who can qualify for construction finance. Permanent finance is again out of question, as the contractor will not be involved in the constructed facility post-construction and does not have an ownership stake in the constructed facility for which such finance is available. Commercial mortgage backed securities are instruments for reselling an existing permanent loan or mortgage. This entirely discounts the contractor, as any resale of the loan advanced to the owner will only involve the owner. Mortgage again is ownership based and since the contractor has no ownership stake in the constructed facility, he cannot mortgage the constructed facility. However the contractor can mortgage any other property in which he has ownership stake and use the funds advanced on the mortgaged property to start up a construction project. Such an arrangement is as depicted in Figure 11 below.



**Figure 11 – Raising funds by mortgaging**

Thus we see that if a contractor owns some property it is possible to raise funds to meet the funding requirement for one or many projects, by mortgaging the property with a bank. The bank will in turn advance funds equivalent to a certain fraction of the value of the property or in some cases up to the entire value of the property.

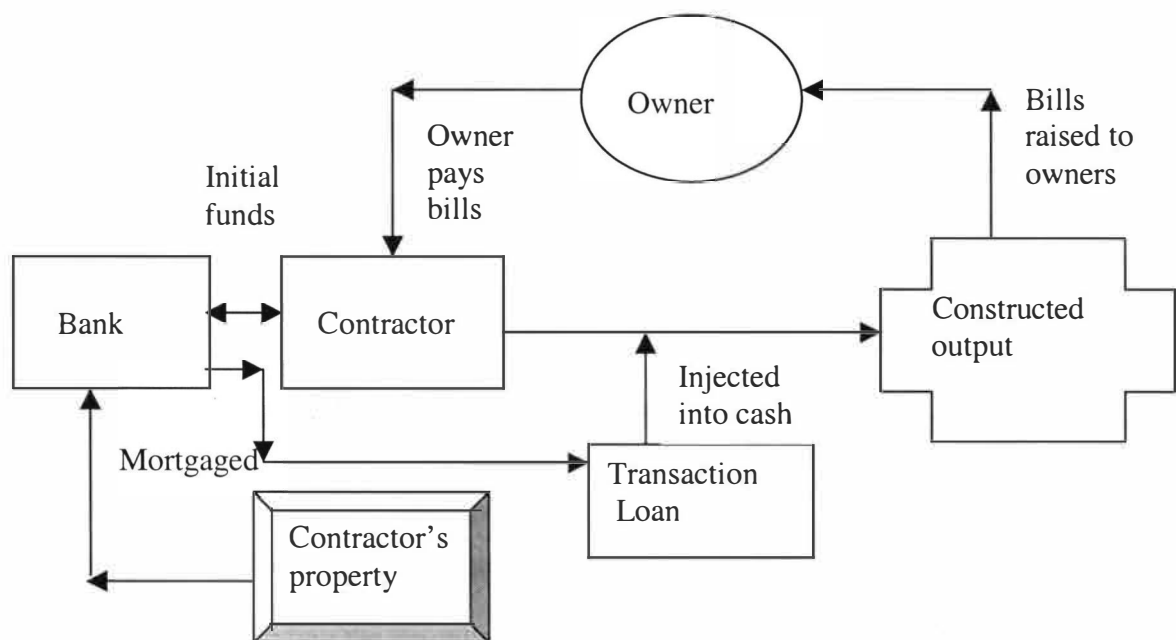
Refinancing as discussed earlier is a method of harnessing the appreciated value of a property without selling the property. It is evident from Figure 10 that the only entity who can avail of this facility is the owner. The contractor can however refinance some of his own properties in which he may have an ownership stake, in order to finance one or many projects. This arrangement is depicted below in Figure 12.



**Figure 12- Refinancing arrangement to raise funds for a contractor**

A revolving line of credit differs from a mortgage loan as it merely sets up an upper limit to the amount of funds that can be advanced against mortgaging any property or assets. It provides the contractor with the flexibility to draw any amount of money within the set

limit and pay interest only for the amount drawn. However as in mortgage the contractor will have to come up with the requisite collateral (personal property). Further in both cases the contractors' ability to borrow is limited to the market value of his assets. While this method may be a viable method for contractor financing, the limitations posed by collateral requirement might inhibit the contractor's growth. Schaufelberger, (1999), states that, volumes, along with profitability are the measures of a contractor's success. Referring to Fig 10 we see that transaction loans could be useful in the contracting scenario depicted. Assuming that the contractor has used up his entire line of credit and requires some money to bid for an unanticipated project, he could seek a transaction loan for an amount less than his immediate receivables. While the arrangement depicted in Fig 13 below is a slight improvement upon the line of credit arrangement, it is still largely dependent upon the value of the collateral offered to the bank by the contractor rather than the contractor's competence at executing projects.



**Figure 13 – Transaction loan issues with an LOC arrangement**

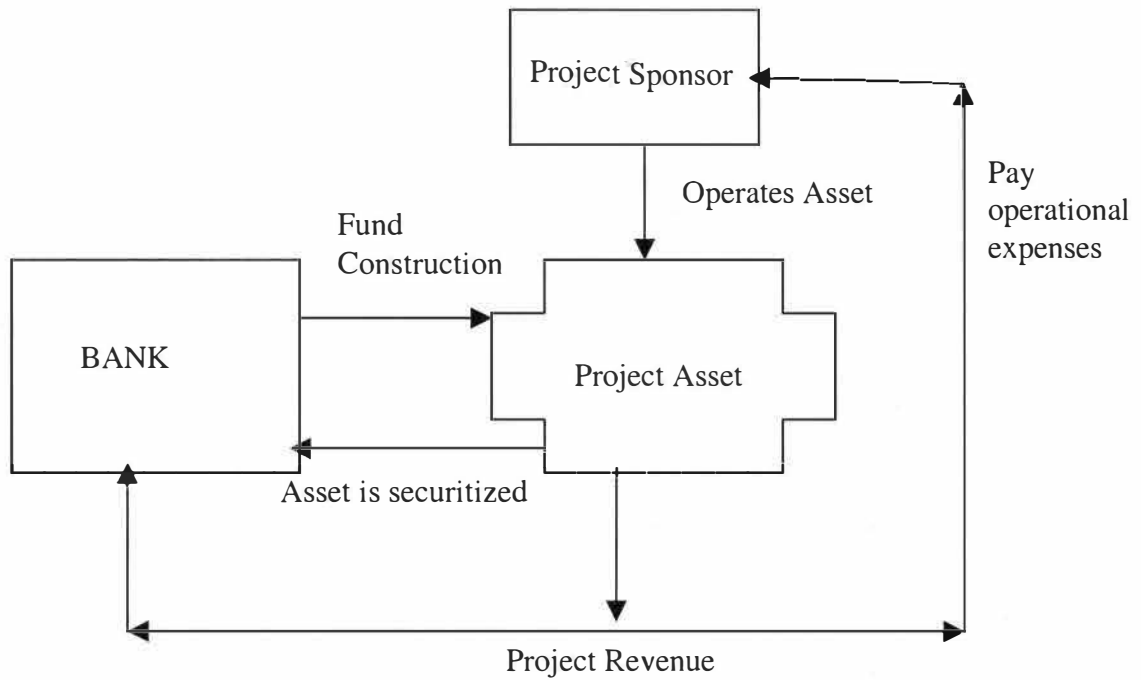
## 4.2 Adapting project finance to construction contracting

It is ironical that while the mutual business that the contractor and the bank have has a large bearing on the contractor's competence, there appear to be no structured and reliable ways by which the bank might factor the competence of the contractor and advance funds for a project on this basis. The lack of standardized metrics for evaluating contractor competence and lack of standardized project management procedures maintained by contractors could be the reasons attributable for the unavailability of funds for project execution in specific.

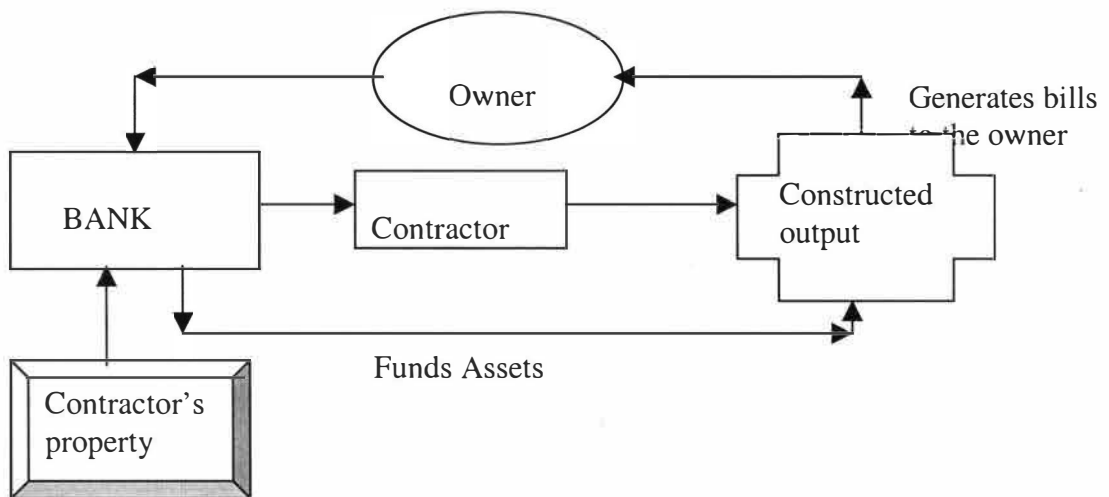
It cannot be concluded from the various above issues above that banks are risk averse as there is testimony available in project finance, wherein banks lend on a non-recourse basis and look to the revenue generated by the asset for the servicing of the loan.

However as mentioned in the foregoing pages, project financing is an outcome of extensive risk analysis and transfer. Contractual agreements are put in place such that the revenue generated by the asset is paid back to the lenders. It then follows that non-recourse financing can be secured if sufficient risk analysis and transfer or insurance is carried out on a project to project basis. Assuming that such extensive risk analysis and transfer can be done, the non-recourse funding to a contractor will become identical to a large

Transaction loan wherein the risk of retrieving the interest and capital might be offset by securitizing the assets or parts of assets supplied by the contractor to the project owner apart from securitizing the revenue generated from the project billing. Thus Fig 13 would be transformed to Fig 15.



**Figure 14-Typical arrangement of a project finance scheme**



**Figure 15 – Arrangement of Project finance for contractors**



The bank would fund the assets supplied by the contractor in the constructed output. The progress payments (or revenue) generated by the constructed output would be paid by the owner to the bank due to contractual agreements put in place in order to securitize the revenue from the constructed output. Meanwhile the contractor would offer collateral to the bank, which could offset residual risk.

Given the arrangement in Figure 15, we will now endeavor to ascertain whether it can be of help in alleviating the various problems faced by contractors, highlighted in the foregoing pages.

**The liquidity problem:** This is an outcome of poor cash flow prediction and lack of cash management techniques and it cannot be solved by the above arrangement. On the other hand the above arrangement requires a high degree of proficiency in cash flow analysis, management and structuring of the progress measurement system and job planning in such a way that the banks and owners are both comfortable with.

**The working capital problem:** The situation wherein lack of funds prevent taking advantage of opportunity can be prevented by carefully structuring the new projects to be funded by project finance.

**Liability of newness, smallness & adolescence:** A high degree of growth is required to overcome these liabilities. However it is not possible for a bank to affect risk analysis on a contracting company without historical data about that company. This implies that contracting companies, which are new, would at-least have to overcome their liability of adolescence, which is 5 years from the starting up of the firm in order to attract any project finance funds from the banks.

**Pace of growth:** Growth which is based predominantly on volumes in the construction industry can be hastened to a considerable extent by the ability to take up large sized projects with relatively low initial investment by the contractors. This comes about due to the bank's funding of the materials supplied by the contractor to the owner.

**Unplanned growth:** Availability of project finance funds as shown in Figure 15 can completely offset this problem, provided that the contracting company in question has had themselves qualified with a bank and have an understanding with them of the procedural requirements of project financing.

**Changing trend in Project delivery systems:** The changing trend towards the Design-Build methodology which is highly capital intensive can be adopted even by small but competent contractors as the project related funding can address the high capital requirement in such projects.

Thus we see that out of the six initially stated problems, the project financing method outlined in Fig 15 has the potential to solve at least 4 of them namely (a) The working capital problem, (b) Pace of growth, (c) Unplanned growth and (d) Changing trend in Project delivery methods. However this method cannot solve (1) The liquidity problem and (2) The liability of adolescence, newness and smallness problem.

#### **4.3 Assessing contractor capability**

While project finance style limited recourse funding may be a potential panacea to some of the problems of a contractor, a banker would rarely exhibit enthusiasm in lending for such ventures without a thorough analysis of a contractor's competence and some collateral to address the residual risk which the bank might face. Research carried

out by Price and Shawa (1997) in the United Arab Emirates where similar financing methods are in practice and have been highlighted in the following pages also support the above view. A number of attributes of the contracting firm thus gain importance, as they would face possible scrutiny by the lending bank. Some of these attributes are as given below.

- a) Contractors technical capability to do the job and past experience in doing similar jobs or project. This is normally evaluated by scrutinizing the “Resume” of various personnel employed by the contractor, in case the contractor’s company does not have experience in such jobs.
- b) The contractor’s balance sheet: The profitable operation of the company for a specified period of time in the immediate past is the greatest testimony that can be offered for competency in executing projects profitably.
- c) Adequacy of working capital: A smooth cash flow in previous projects is very important in convincing the lenders of the contractor’s ability to structure progress measurement systems to ensure adequate project specific working capital.
- d) Ownership: One of the most important issues that predominate, lending decisions is ownership. The commitment of the owner to his business is evaluated by assessing his current equity and the history of any infusion of equity by the owner.
- e) Financial standing of the client: An important aspect of lending to a contractor is the credit worthiness of the contractor’s client and the client’s ability to pay on time to prevent any upsetting of the planed cash flows.

- f) **Project feasibility:** This is ascertained by the banker, in relation with the contractor's ability to execute such projects.
- g) **Tender make up-** A lender is likely to investigate the various tendered prices for the said project in relation with the price quoted by the borrowing contractor in order to ensure that the price quoted by the contractor is in the same range as others.
- h) **Cash flow of the project:** Any lender seeks the cash flow statement predicted for any project. In a construction project however a lender would seek the progress measurement system backing the projected cash flow statements from the start to finish of the project and the projected weighted percentage completions at every billing stage.
- i) **Cash flow of the parent company:** Though not very common lenders do seek the projected cash flows of the contractor's client to ensure that the client's payment plan includes the contractor and is in line with the contractor's projection.
- j) **Progress monitoring:** Most lenders would require reporting of the project's progress, and the contractor will have to be geared towards satisfying the lender to this end.

#### **4.4 Risk Analysis for project finance**

Apart from the various aspects of a project listed above that would be subject to a lender's scrutiny the absence of a party to assume responsibility of all residual risks will always raise the need for assessing all risks involved. A useful assessment in this regard is the research carried out by Price & Shawa, (1997) and adapted in Table 3. The table depicts responses by 20 banks to various risks on an acceptability scale as indicated.

The average perception, for all the 15 listed risks for lenders we see comes up to 3.26 on a scale of 1 to 5. Thus we see that after making a thorough risk assessment and corresponding appropriate actions the risk perception for project financing lies between negotiable and acceptable with conditions, which itself means that given similar risks anywhere in the world, Project financing should be an acceptable alternative to traditional self funded construction project.

#### 4.5 Non standard methods of financing projects

Further scrutiny of the Project Finance style arrangement being a potential panacea lies in investigating other possible types of financing for the contractor which are given below.

- a) **Joint ventures with the lender:** is going to cost about as much as any kind of loan and has to bear the overheads of the joint venture's staff.
- b) **Joint ventures with owners:** result in loss of proprietary information
- c) **Equity market:** though offers the cheapest finance results in dilution of ownership which many owners are averse to, besides the construction industry historically has not been popular with the capital markets due to the volatility of their earnings.(Cushman and Bigda,1985)
- d) **Lines of credit:** securitized by assets in turn entail high solvency, not otherwise required in the contracting industry.
- e) **Sub contracting:** takes away potential profits.

**Table 3- Acceptability of individual sources of risk for banks**

Source: Price and Shawa, (1997)

No	Source of Risk	Acceptability Scale					Intensity
		1	2	3	4	5	
1	Deficiency in working capital	1	1	3	6	9	4.1
2	Adequacy of reserves	0	1	2	5	12	4.4
3	Delay in commencement	2	6	9	1	2	2.3
4	Rise in costs	0	4	6	10	0	3.3
5	Contractual matters	0	1	2	1	16	4.6
6	Variation in interest rates	2	5	12	1	0	2.6
7	Project Completion	0	0	0	5	15	4.8
8	Rate of inflation	1	8	6	5	0	2.8
9	Increase in debt-to-equity ratio	1	2	10	5	2	3.3
10	Cost overrun	0	1	8	6	5	3.8
11	Lengthening of repayment period	0	2	5	13	0	3.1
12	Variation in orders and consequent increase in contract duration & price	8	2	5	4	1	2.4
13	Currency exchange variation	4	5	7	3	1	2.6
14	Political change	6	4	5	4	1	2.5
15	Force majeure events	4	6	5	4	1	2.4

1 = Acceptable

2= Fairly acceptable

3= Negotiable

4= Acceptable with conditions

5= Unacceptable.

Thus having studied the viability of the project finance style financing for construction contractors, Figure 15 depicting the rudimentary arrangement can be transformed into an adaptable model for a contracting company as shown in Figure 16. While this model depicts specific stages of a project being financed by a bank, it may not be always the same and the funding would be dependent upon the kind of contractual arrangement that has been negotiated by the contractor with the owner and the bank.

#### **4.6 Proposed contractual arrangement in project financing for contractors**

We see from the above that 'Project finance' style financing for contractors is heavily dependent upon the non-recourse or limited recourse financing by the bank. In order that these schemes have scope for implementation, it needs to be firmly secured by unambiguous contractual arrangement involving the owner, the banker and the contractor. The necessary contractual agreements in addition to those already listed in AIA-A201, A-401 and A311 (American Institute of Architects) are given below in brief.

##### **For the Owner:**

- a) The owner agrees to pay all bills raised by the contractor into the trust fund account as per agreed 'schedule of payments'.
- b) The owner mandates lien waivers at each billing stage for all material supplied by the contractor and financed by the bank, for which the owner has made payment.
- c) The owner recognizes the banker as the "Third party beneficiary"<sup>19</sup> for all of the contractor's invoices.

**For the Banker:**

- a) The banker agrees to fund all the material requirement of the project as per estimates, until the owner reimburses the same via progress payments into the trust fund account.
- b) The banker agrees to jointly operate the trust fund account for the disbursement of funds to the sub contractors.
- c) Banker is assigned as the “Third party beneficiary”<sup>19</sup> for the invoices of the contractor under Article 9 of the Uniform Commercial Code (UCC).

**For the Contractor:**

- a) The contractor agrees with the Owner to receive payment from the owner into the trust fund account
- b) The contractor agrees with the Banker and the Owner to jointly operate the trust fund account with the Banker for the disbursement of funds to sub contractors.
- c) The contractor agrees to purchase cost overrun insurance and payment bonds and in this regard agrees to indemnify the banker for all losses arising out of reasons attributable to the contractor.
- d) The contractor agrees not to extract the free cash flow from the project until the end of the project and the payment of all bank dues.
- e) The contractor assigns the Banker as the “Third party beneficiary”<sup>19</sup> under Article 9 of the UCC.



### **Banker's perspective on the contractual arrangement:**

For a banker such a contractual arrangement may be highly desirable as it secures the funds lent to the contractor, besides discounting the risk of diversion of the cash flow by the contractor for other projects. Further such a 'stand alone' project specific arrangement implies that other loss making projects of the contractor or even the bankruptcy of the contractor cannot sufficiently influence the cash flow of the project. Cost overrun insurance purchased to indemnify the banker gives added security to the lending. Such a situation would be desirable to both the owner and the banker.

### **Contractor's perspective:**

While such an arrangement might prove to be expensive on account of insurance charges and banker's management fees, it might also be the only option available to the contractor to fund the project.

### **Owner's perspective:**

To the owner such an arrangement implies a lesser risk of contractor non-performance due to diversion of cash flow or non-payment of sub contractors and may reflect in his insurance costs. Sweet (1992) notes that owners do not want their funds to be diverted by the contractor, hence such an arrangement may be desirable to the owners.

## **4.7 Reasons for the proposed contractual arrangement**

Further evidence to the existence of the 'non payment of sub contractors' problem exists in the lapses of the AIA clauses (American Institute of Architects). The AIA does not require the contractor to submit evidence of payment to sub contractor or lien waivers, as a condition to receiving progress payments. (AIA-A201-Clause 9.3). Nor

does certification under A-201, Clause 9.4.2 represent that the architect has reviewed sub contractor or supplier requisitions or that he has determined to whom the previous payments have been made. Finally clause 9.6.4 states that the owner or architect has no obligation to see to it that the sub contractors are paid except as required by law (Sweet, 1992). The above loop holes in the AIA documents have been plugged by most owners by using trust fund statutes. Trust fund statutes impress funds paid to the contractor with a trust, with severe penalties for breach of trust by the contractor. Owners have also gone ahead and mandated contractors to establish separate trust bank accounts for receipt and disbursement (Sweet, 1992). The Texas “Trapping statute” allows an owner to withhold, and pay sub contractor directly if the latter notifies the owner it has not been paid and the prime contractor has no objection.

The above two options are not very different from the arrangement suggested in Figure 16, except that the bank is the only major subcontractor and has joint signing authority for the trust fund account. Another technique is to issue joint checks to both, the prime and sub contractors or suppliers (Sweet, 1992). This again prevents diversion of project cash flow thus we see that by way of creating a trust bank account or by issuing joint checks for the money due to the sub contracted namely the bank can be firmly securitized.

#### **4.8 Risk insurance in the proposed contractual arrangement**

Given the nature of the contractual arrangement above, insurance of risks involved therein gains importance. Environmental issues, poor productivity due to

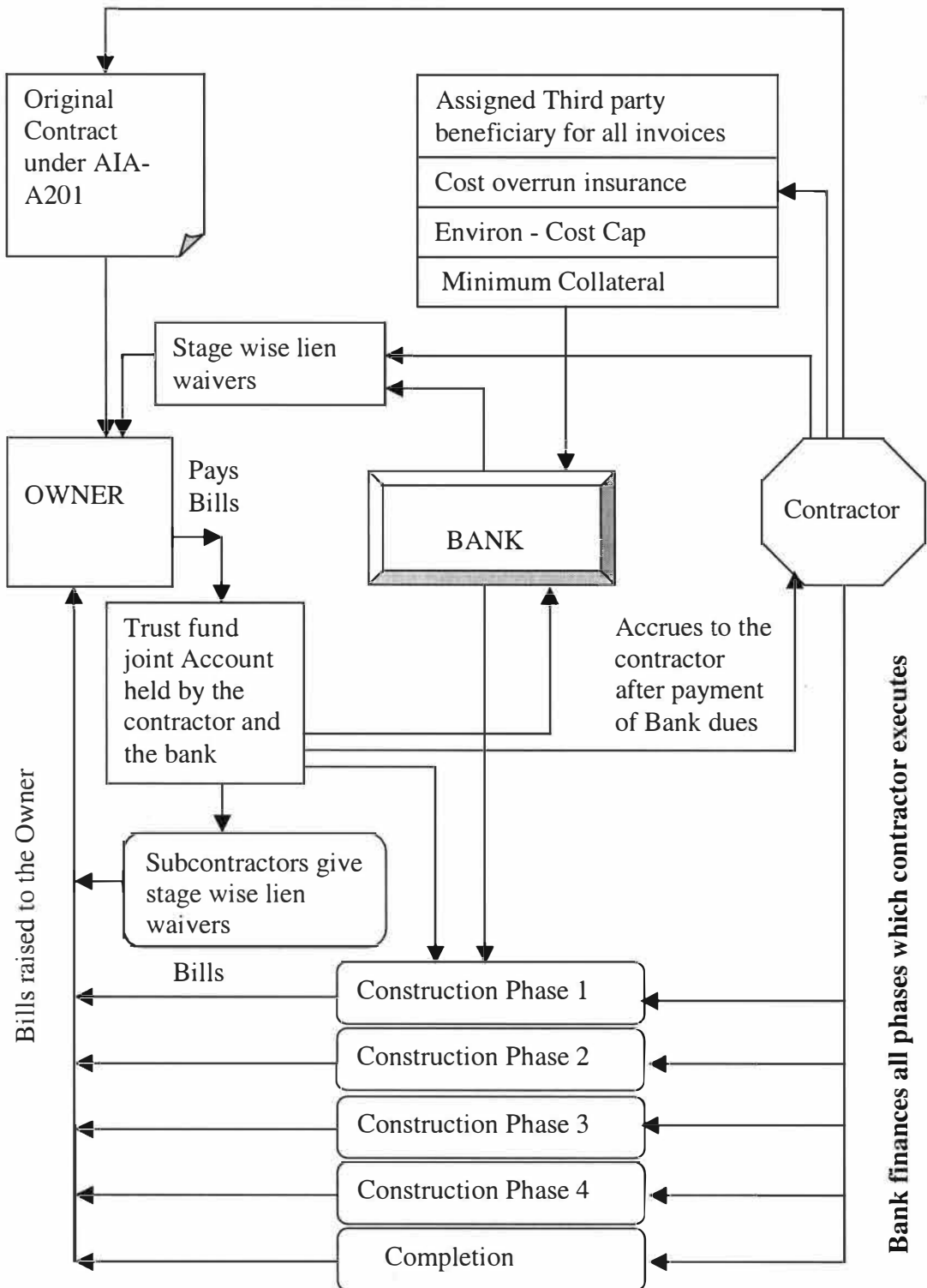
strikes, mistakes in estimation or designs etc can result in huge cost overruns. The repayment of borrowed funds in the event of such an overrun becomes a critical issue and hence such events are to be insured appropriately. Design and estimation errors are covered by the “Professional liability insurance”, while environmental risk and cost overrun risks, are insured by “Cost Cap” and “Cost overrun insurance” respectively. Cost overrun insurance premiums can typically range from 2.5% to 4.0% of the limit purchased and in any project the limit to which it is purchased varies from 10% to 20% of the project value. Thus adding a cost of 1% to 2% to the project cost. However when coordinated with other policies such as Wrap-up insurance, the component of cost for cost overrun may be lower (Smith et al, 2001).

Another recurring situation involves claims by laborers or suppliers against sureties on payment bonds. A contractor who undertakes a substantial construction project is usually required to furnish such a bond. Payment bonds are required for public works by statutes and ordinances at all levels of government; they are required by the private construction jobs for the construction contract itself. Such a bond involves three parties: the contractor (as principal, i.e., principal obligor), a bonding company (as surety), and the owner (as obligee). It embodies promises by two parties, one by contractor to the owner and one by surety to the owner, that all debts incurred by the contractor for labor and materials will be paid. The surety charges the contractor a premium for the bond and the contractor passes this on to the owner as part of its costs. This is to prevent problems that may arise when the contractor encounters financial difficulties in the course of performance and fails to pay the laborers and suppliers. The courts allowing laborers and suppliers to recover as beneficiaries of payment bonds, irrespective of the owner being private or

government has overwhelmingly upheld the logic and sanctity of payment bonds (Farnsworth, 1999). In the event that the owner does not require a payment bond from the contractor, a contractor wishing to utilize the Project finance model outlined in Fig 16 would have to furnish such a bond at his own cost to indemnify the bank that lends him money.

#### **4.9 Role of “Third party beneficiary” assignment in the proposed model**

Like third party beneficiary contracts, assignments concern persons who were not party to the original contract. Assignment is not a situation where the original parties create rights in a third party as a part of the original contract. Rather it is a situation where some or all of the rights of the original parties are transferred to someone who was not a party. Today assignment of rights is an essential part of commercial finance. Governed by Article 9 of the Uniform commercial code (UCC), rights to the payment of money for goods sold or services rendered can be easily transferred, assigned, to third persons either as security for debt or as an outright sale. In a sense the debtor's right to pay her creditor is destroyed. The creditor can assign the right to receive the debtor's payment to anyone and the debtor can be required to pay that person. Under the U.C.C.(9-318) the debtor can demand proof that the person claiming the right to the debtor's payment has in fact been assigned that right by the creditor and until the proof is forthcoming the debtor may continue to pay the creditor, Miller(1999). In a very real sense a contract becomes property at this point where the person to person rights created by two people become transformed into a transferable asset which can be used to secure loans or can be sold outright, Miller (1999).



**Figure 16- Working arrangement of the Project finance model**

## **Chapter 5: Discussion and conclusion**

### **5.1 Results of a brief survey**

It might be apparent from the discussion regarding various forms of financing that it predominantly deals with real estate financing or asset financing as in industries. This may be so because financing is always done for asset creation and not for the process of asset creation. The process of asset creation is considered as a part of the asset's cost. Thus the companies which specialize in the process of asset creation find themselves with very limited options. A brief survey carried out in the Kalamazoo area by the author revealed the following. Though the survey results can in no way facilitate a statistical conclusion it is roughly indicative of the trend in the small construction industry.

### **5.2 Advantages and disadvantages of using project finance in construction contracting**

#### **Advantages for the Contractor:**

- a) Value earned for the contractor's competence in undertaking projects.
- b) Capability to take on larger projects.
- c) Higher growth opportunities for the contractors company.
- d) Creditors have limited recourse to other company assets.
- e) Ease of accounting for tax purposes.

- f) Enhancements of bonding capacity due to low risk in the project finance model.
- g) Possibility of lower insurance and bonding costs.

**Table 4- Minor survey carried out in the Kalamazoo area**

<b>S.No</b>	<b>Relevant questions</b>	<b>L.D.Docsa Associates Inc</b>	<b>Tim Schuring Inc</b>	<b>CMS Services</b>	<b>National city bank</b>
1	What is the primary method of financing projects	Personal Finance	Personal Finance	Client advances / Sub contractors	Contractors use their own money
2	What is the alternate method in the event of shortfall in working capital	Line of credit	Line of credit	Line of credit	Line of credit is advanced against collateral or accounts receivables for old clients
3	Is there any other credit, or loan offered to deserving contractors	No	No	No	Not for contractors

### **Disadvantages to the contractor:**

- a) Extensive risk analysis & management is to be done for each project.
- b) Large bank fees and other transaction costs can become a burden.
- c) Well-qualified personnel are required to support the complications of Project finance.
- d) Diversion of funds from the cash flow of the project for other purposes is not possible.
- e) The high degree of control that a bank will exercise might conflict with other business commitments or agreements, which the contractor may have.
- f) Liabilities of a trust fund account.

### **Advantages of Project Financing to the Banks:**

- a) Scope for fee generating services.
- b) Security of funds lent.
- c) Short term lending opportunity, which is less cumbersome and risky.
- d) The project can be insulated from the contractor's possible bankruptcy due to other projects.
- e) The proposed model opens up the huge high-risk 'contractor finance' market.

### **Disadvantages of Project Financing to the Banks:**

- a) Project risks have to be shared by the banks.
- b) Due to the limited recourse nature, banks stand to lose at least the interest earnings on the money they lend to the contractor.



- c) Due to the specialized nature of this transaction, banks will have to appoint someone who has sufficient experience in dealing with Project based finance and also has adequate knowledge of the construction industry.

#### **Advantages of Project finance to owners:**

- a) Reduction of risk of non performance by contractor due to preventing diversion of cash flow
- b) Reduction of “Course of construction risk” due to guaranteed payment of sub contractors and making available stage wise lien waivers.
- c) High degree of legalities mandates professionalism from contractors.
- d) High degree of control over contractor.
- e) Lower risk of cost overrun due to lack of control.

#### **Disadvantages of Project financing to owners:**

- a) Higher legal exposure

### **5.3 Validation of impetus to growth**

Growth of a company is an easily quantifiable metric; hence it follows that should project finance truly provide an impetus to the growth of a construction contracting company, it should be easily verifiable using historical data of a company. However on account of the unavailability of such data to the researcher, the pertinent financial data have been assumed and the profitability of a construction company has been constructed

as given in table 5, over a period of 13 years wherein the company has been funded by the line of credit mechanism.

Column 1 of table 5 indicates the year of operation of the construction firm.

Column 2 indicates the amount of revolving line of credit it has secured from its bank.

Column 3 indicates the amount of personal capital invested in the firm each year. Column 4 is the sum total of column 2 and 3 and indicates the amount of money available to a contracting firm to take up projects. Column 5 is the turnover of business the company can anticipate assuming that any given project will have at least four running account bills leading to project completion. Column 6 indicates a profit of 8% on the turnover that a small construction company can expect. Note that this higher than the industry average which stands at 7 %. This has been assumed arbitrarily to account for the low overheads that a small company is likely to have.

Column 7 indicates the interest paid by the company for the money borrowed in the line of credit. This is assumed at 20%, thus the figures in this column are 20% of those in column 2. Column 8 indicates the amount of earnings that the company can anticipate before taxes and is calculated by deducting the figures in column 7 from those in column 6. Column 9 indicates the taxes that the company will be expected to pay. This has been assumed at a corporate tax rate of 34%. Thus the figures in column 9 are 66% of those in column 8. Column 10 indicates the percentage returns on the personal capital invested shown in column 3. Column 11 indicates the percentage growth in the turnover of the company over the previous year. Column 12 indicates the amount of reinvestment carried out by the company owners from the earnings after tax, indicated in column 9. It is assumed be 50% of net earnings in this case.

On computing the average growth of the turnover (column 11) over a period of 13 years we get an average growth rate of 5.87% every year. This is the likely average growth for a company using the line of credit mechanism for funding its operation.

On the other hand consider the same company having secured project finance for some or one of its projects. This has been depicted in table 6. Note that the table 6 has three additional columns that have been inserted namely 5A, 5B and 5C. Other than these all other columns except column 6 are identical in their representation. Column 5A indicates the amount of Project financing that the company has secured .The sum of \$150,000 has been arbitrarily assumed. The reason that project finance funds are being sought only in the sixth year of operation is because the liability of adolescence, newness and smallness, begin to recede only after 5 years (Refer Fig 1)

Column 5B indicates the turnover that can be achieved using additional project finance funds and the assumption again is that there will be at least four running account bills leading to project completion. The figures in column 5B are thus 4 times those in 5A.

Column 5C is the sum total of column 5B and 5 and indicates the total turnover of the company. Column 6 is the profit at 8% over the total turnover reflected in column 5C.

Comparison of tables 5 and 6 for column 11 which is the growth in volume every year indicates that infusion of project finance funds result in an abrupt increase in turn over whenever such funds are infused into the operation of the company. Assuming that the company avails of project finance funds keeping in view the elements of sustainable growth outlined in the foregoing pages we see that the average growth for a period of 13 years for this company comes out to be 12.28% as computed from column 11 of table 6.

This is twice the average growth computed from column 11 of table 5. However this growth rate of 12.28% needs to undergo adjustment for increased insurance costs arising out of the Project finance arrangement, which is enunciated below.

#### **5.4 Impact of insurance costs**

We have seen in section 4.8 that the insurance for cost over run in particular adds up 1% to 2% on the project cost. For the purposes of calculating the impact of increased insurance costs on growth we will consider the increased cost to be at 1% and thus reduce the profit margin of the contractor by 1%. Though this is a very rough approximation method, it is an error on the safer side. The corresponding calculations are reflected in Table 7 and it is seen that the profitability of the contractor drops to 7% of the turnover and the average growth over a period of 13 years drops to 11.42% from 12.28% achieved in Table 6. Thus we see that even though Project finance attracts higher insurance costs the growth rate achievable with this method is greater than that can be achieved in a traditional “Line of credit” arrangement.

**Table 5- Company funded by “Line of credit” mechanism**

1	2	3	4	5	6	7	8	9	10	11	12
Year	Revolving line of credit	Personal capital	Total Investment /Working capital	Turnover @ 4 times the working capital	Profit @ 8% of Turnover	Interest Payment @ 20% on borrowing	Total Earnings before tax	Earnings after tax @ 34%	% returns on personal capital invested	%age growth in turnover	Investment in Assets at 50% of net earnings
1	150,000	22,500	172,500	690,000	55,200	30,000	25,200	16,632	74		8,316
2	150,000	30,816	180,816	723,264	57,861	30,000	27,861	18,388	60	4.60	9,194
3	150,000	40,010	190,010	760,041	60,803	30,000	30,803	20,330	51	4.84	10,165
4	150,000	50,175	200,175	800,701	64,056	30,000	34,056	22,477	45	5.08	11,239
5	150,000	61,414	211,414	845,655	67,652	30,000	37,652	24,851	40	5.32	12,425
6	150,000	73,839	223,839	895,356	71,628	30,000	41,628	27,475	37	5.55	13,737
7	150,000	87,576	237,576	950,306	76,024	30,000	46,024	30,376	35	5.78	15,188
8	150,000	102,765	252,765	1,011,058	80,885	30,000	50,885	33,584	33	6.01	16,792
9	150,000	119,566	269,566	1,078,226	86,258	30,000	56,258	37,130	31	6.23	18,565
10	150,000	138,122	288,122	1,152,486	92,199	30,000	62,199	41,051	30	6.44	20,526
11	150,000	158,647	308,647	1,234,589	98,767	30,000	68,767	45,386	29	6.65	22,693
12	150,000	181,340	331,340	1,325,362	106,029	30,000	76,029	50,179	28	6.85	25,090
13	150,000	206,430	356,430	1,425,720	114,058	30,000	84,058	55,478	27	7.04	27,739

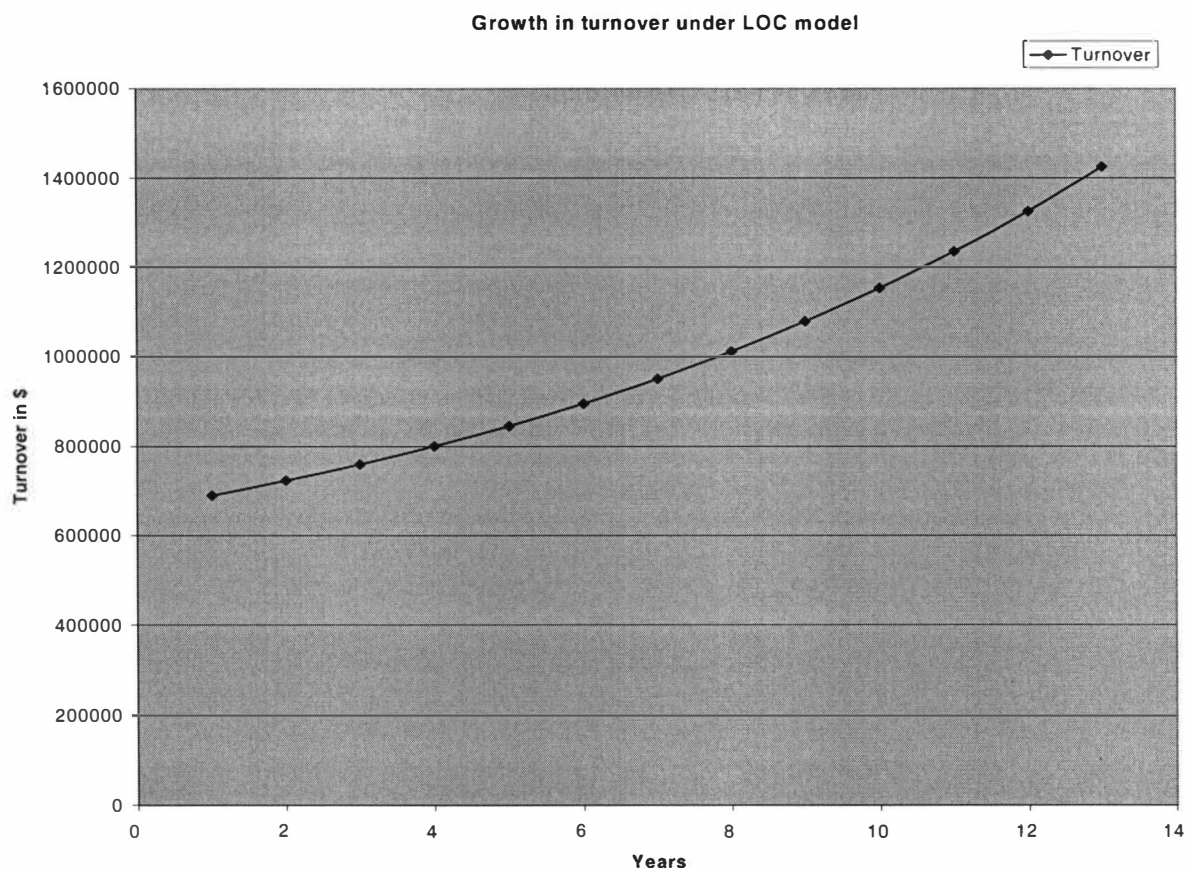
Table 6- Company funded by the project finance method

1	2	3	4	5	5A	5B	5C	6	7	8	9	10	11	12
Year	Working lined credit	Personal capital	Total Investment Working capital	Turnover @ 4 times the working capital	Project Finance funds	Turnover using PF funds	Total turnover	Profit @ 8% of Turnover	Interest Payment @20% on borrowing	Total Earnings before tax	Earnings after tax @ 34%	% returns on personal capital invested	%age growth in turnover	Investment in Assets at 50% of net earnings
1	150,000	22,500	172,500	690,000	0	0	690,000	55,200	30,000	25,200	16,632	74		8,316
2	150,000	30,816	180,816	723,264	0	0	723,264	57,861	30,000	27,861	18,338	60	460	9,194
3	150,000	40,010	190,010	760,041	0	0	760,041	60,803	30,000	30,803	20,330	51	484	10,165
4	150,000	50,175	200,175	800,701	0	0	800,701	64,056	30,000	34,056	22,477	45	508	11,239
5	150,000	61,414	211,414	845,655	0	0	845,655	67,652	30,000	37,652	24,851	40	532	12,425
6	150,000	73,839	223,839	895,356	150,000	600,000	1,495,356	119,628	60,000	59,628	39,355	53	4345	19,677
7	150,000	93,516	243,516	974,056	150,000	600,000	1,544,056	125,925	60,000	65,925	43,511	47	500	21,755
8	150,000	115,272	265,272	1,061,087	150,000	600,000	1,661,087	132,887	60,000	72,887	48,105	42	524	24,053
9	150,000	139,324	289,324	1,157,298	250,000	1,000,000	2,157,298	172,584	80,000	92,584	61,105	44	2300	30,553
10	150,000	169,877	319,877	1,279,519	250,000	1,000,000	2,279,519	182,361	80,000	102,361	67,538	40	536	33,779
11	150,000	208,655	358,655	1,444,625	400,000	1,600,000	3,044,625	241,170	110,000	131,170	86,52	43	2438	43,286
12	150,000	269,92	369,92	1,587,79	400,000	1,600,000	3,187,79	255,02	110,000	145,02	95,74	39	543	47,857
13	150,000	294,799	444,799	1,779,197	500,000	2,000,000	3,779,197	302,335	130,000	172,335	113,742	39	1565	56,871

**Table 7 – Company funded by the project finance method with insurance costs  
reflecting on average growth.**

1	2	300	4	5	5A	5B	5C	6	7	8	9	10	11	12
Year	Revolving line of credit	Personal capital	Total Investment Working capital	Turnover @ 4 times the working capital	Project Finance funds	Turnover using PF funds	Total turnover	Profit @ 7% of Turnover	Interest Payment @20% of borrowing	Total Earnings before tax	Earnings after tax @34%	Personal capital invested	%age growth in turnover	Investment in Assets at 50% of net earnings
1	150,000	22,500	172,500	690,000	0	0	690,000	48,300	30,000	18,300	12,078	54		6,039
2	150,000	28,539	178,539	714,156	0	0	714,156	49,991	30,000	19,991	13,194	46	3.38	6,597
3	150,000	35,136	185,136	740,544	0	0	740,544	51,838	30,000	21,838	14,413	41	3.56	7,207
4	150,000	42,343	192,343	769,370	0	0	769,370	53,856	30,000	23,856	15,745	37	3.75	7,872
5	150,000	50,215	200,215	800,860	0	0	800,860	56,060	30,000	26,060	17,200	34	3.93	8,600
6	150,000	58,815	208,815	835,260	150,000	600,000	1,435,260	100,468	60,000	40,468	26,709	45	44.20	13,354
7	150,000	72,169	222,169	888,678	150,000	600,000	1,488,678	104,207	60,000	44,207	29,177	40	3.59	14,588
8	150,000	86,758	236,758	947,031	150,000	600,000	1,547,031	108,292	60,000	48,292	31,873	37	3.77	15,936
9	150,000	102,694	252,694	1,010,777	250,000	1,000,000	2,010,777	140,754	80,000	60,754	40,088	39	23.06	20,049
10	150,000	122,743	272,743	1,090,973	250,000	1,000,000	2,090,973	146,368	80,000	66,368	43,803	36	3.84	21,901
11	150,000	144,645	294,645	1,178,579	400,000	1,600,000	2,778,579	194,501	110,000	84,501	55,770	39	24.75	27,885
12	150,000	172,530	322,530	1,290,119	400,000	1,600,000	2,890,119	202,308	110,000	92,308	60,924	35	3.86	30,462
13	150,000	202,992	352,992	1,411,966	500,000	2,000,000	3,411,966	238,838	130,000	108,838	71,833	35	15.29	35,916

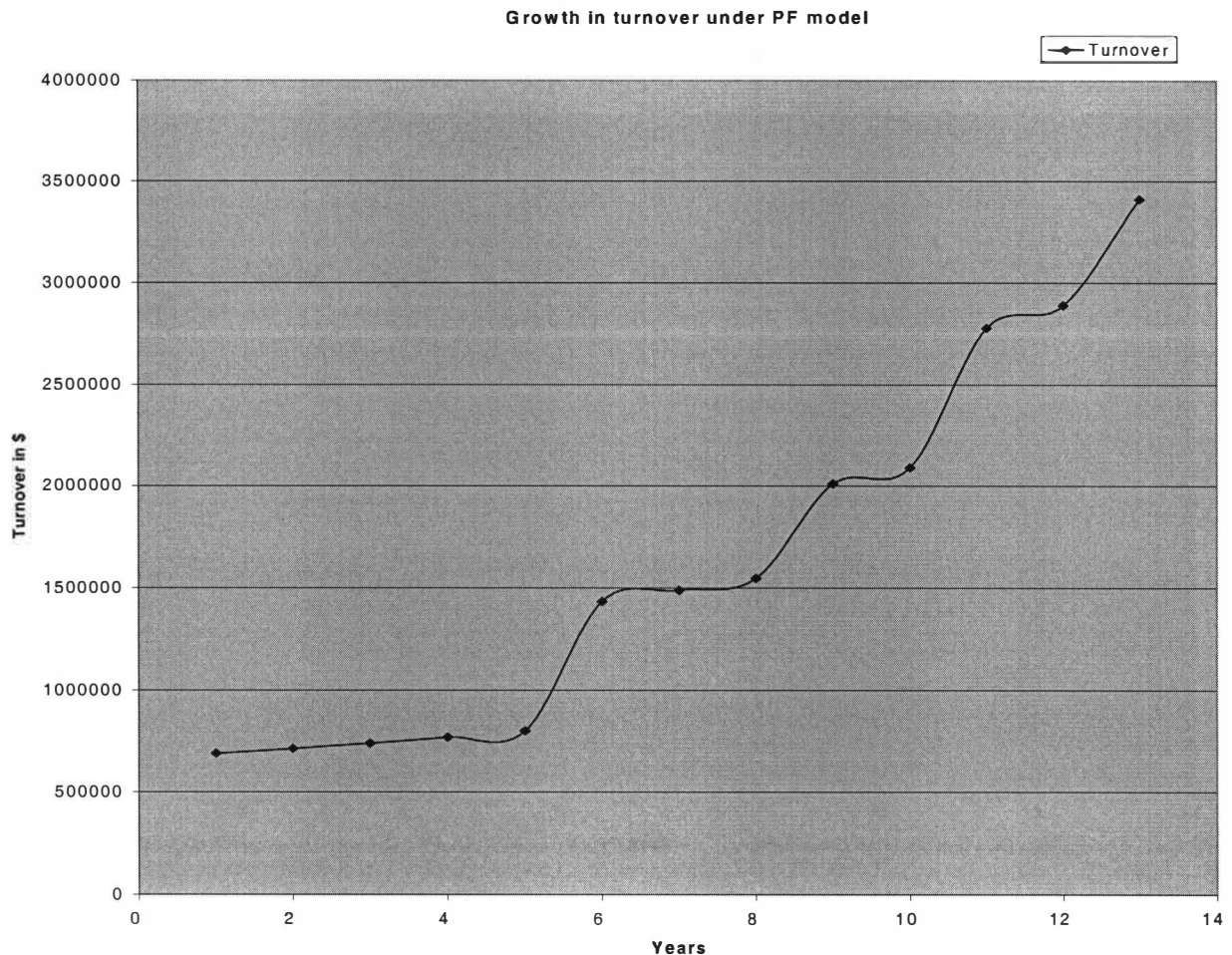
Data in Table 5 is graphically represented in figure 17. Note that growth in the contractor's turnover is linear but the average rate at which the yearly turnover grows is a mere 5.87%. Consequently, at the end of a 13-year period the contractor can anticipate to execute projects worth only USD 1,425,720/-.



**Figure 17- Growth in turnover under the 'Line of Credit' arrangement**

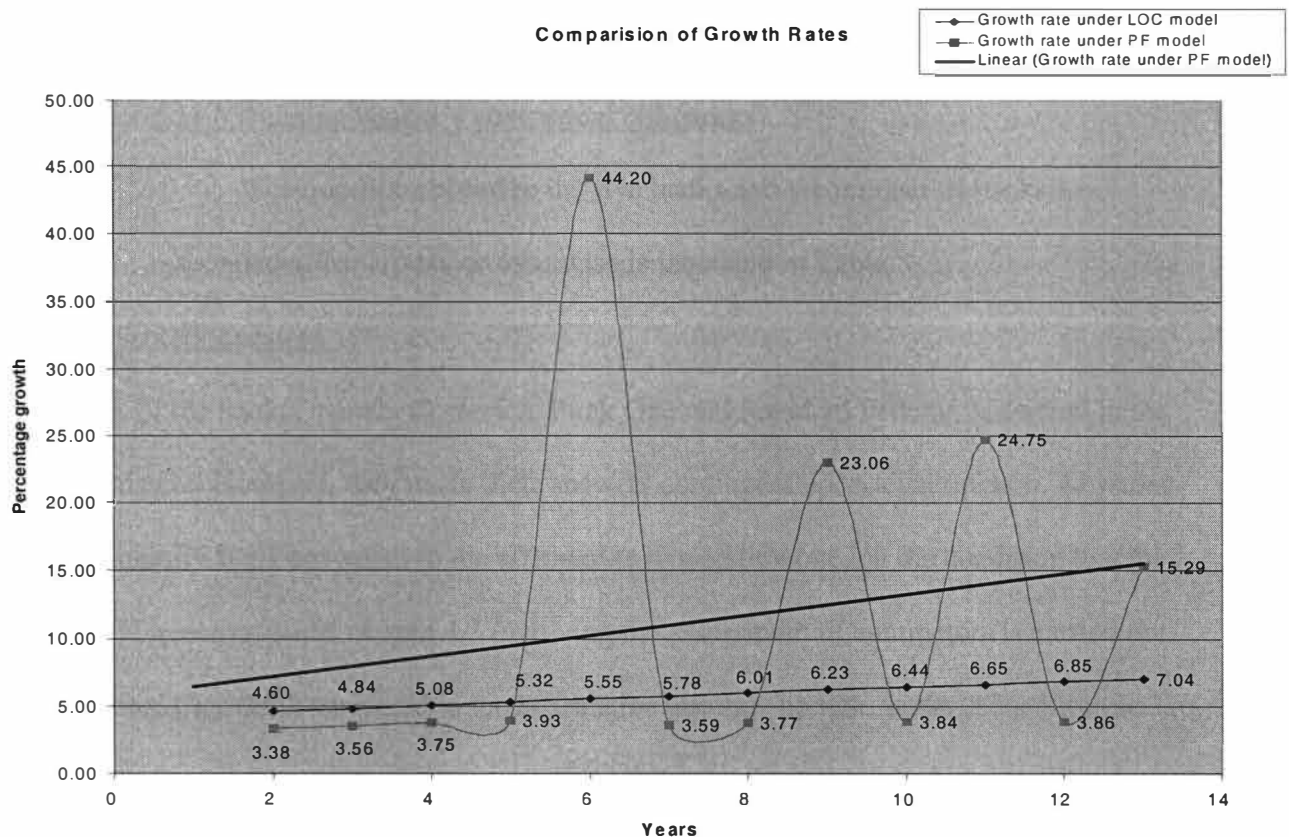


Data in Table 7 is graphically represented in figure 18. Note that the growth rate of the contractor's company is non-linear and abrupt due to the intermittent infusion of project finance capital. This is also unlike the growth rate of a similar company operating under the 'Line of credit' mechanism. While abrupt increase in growth is likely to place demands on adequate management skills and mobilization capability, this is a requirement for contractors choosing to operate under this mechanism and at times could prove to be a limiting factor for the project finance model.



**Figure 18- Growth rate under the project finance model**

A comparison of the growth rates generated by both methods of financing is graphically shown in figure 19. While the PF model is highly non-linear in comparison with the LOC model, the average linear growth rate over a period of 13 years works up to be 11.42%. Consequently, the contractor can anticipate doing a turnover of USD 3,411,966/- in the 13<sup>th</sup> year of profitable operation, which is 239% higher than that he could anticipate using the LOC model.



**Figure 19- Comparison of the growth rates under the PF model and the LOC model**

## 5.5 External validation of model

The validity of the proposed project-financing model was examined by various external parties who might be potentially involved in such a financing mechanism. The connectivity between the various elements and the responsibility arising out of the same as contractual obligations, listed in item 4.6, were structured as questions in separate questionnaires designed for each of the potential parties to the mechanism. There were 13 different samples including 5 samples in the banking industry, 5 samples among the owners and 3 samples among the contractors. The responses to each of the questions were solicited in personal interviews lasting over two hours and were voice recorded with the permission of the interviewee.

### 5.51 Validating banker's contractual obligation

The questions posed to the five banks and the number of banks who responded affirmatively or otherwise is tabulated in Table 8.

#### Analysis for question 1:

Three of the banks, namely Comerica, Bank One and Standard Federal, answered in the affirmative. However, they made their answers contingent upon legal opinion. Keystone Community Bank answered in the affirmative to question one, on the condition that the due diligence outlined in item 4.3 involving the assessment of contractors is carried out. National City Bank answered in the affirmative and saw no risk, as the money was secure in the trust fund account. Thus, we see that all five banks interviewed were willing to lend money on a limited recourse basis when assigned as third party beneficiaries for the contractor's invoices and indemnified by the contractor through payment bonds and other insurance, though the entire arrangement would be subject to legal scrutiny.

**Table 8 – Responses of Bankers to the Contractual Obligation of  
Project Finance Model**

S.No	Given the contractual arrangement	YES	NO
1.	If a contractor assigns your bank as the 'Third party beneficiary' for the payment of all of the contractor's invoices, indemnifies your bank by purchasing cost overrun insurance, payment bonds and environmental insurance, will it be possible for your bank to lend money to the project to fund all the material requirements of the projects as per estimates until the owner reimburses the same into the trust fund account on a non-recourse or limited recourse basis?	5	0
2.	Will it be acceptable for your bank to operate the jointly held trust fund account with the contractor for the disbursement of the funds?	5	0
3.	Will it be possible for your bank to issue lien waivers at each billing stage for the previous payments settled by the owner?	5	0
4.	Will the suggested model be acceptable to your bank in its current form or do you see the necessity for some changes?	5	0
5.	What is the rate of interest charged by your bank for such transactions?	Range of 5.75-7.75%	
6.	What might be your bank's management fees on a percentage basis on the amount of loan lent?	Range of ½-1½%	
7.	How many years of successful operation will the bank expect from a contractor in order to advance funds on this basis?	Range of 3-10 Years	

Analysis for question 2:

Three of the banks, namely Comerica, National City and Bank One, answered in the affirmative and did not site any legal concerns as the procedure was in practice and was a

secure arrangement. However, Comerica placed a condition that the trust fund account would have to be held at Comerica. Although the Keystone Community Bank was agreeable to the mechanism and answered in the affirmative, it declined trust fund facilities in its establishment. The Standard Federal Bank held their affirmation contingent upon legal opinion. Thus, we see that a majority of the banks (four out of five) were agreeable to jointly holding and operating a trust fund account while the fifth one was agreeable contingent upon legal opinion.

Analysis for question 3:

Four of the banks, namely Comerica, National City, Keystone Community Bank, and Bank One, all answered affirmatively to question three and qualified the same by stating that they were merely a conduit for the lien waivers and hence were agreeable to issuing the collected lien waivers to the owner for payments received. Only one bank, Standard federal was agreeable contingent upon legal opinion. Thus, we see that the majority of the banks (four out of five) were agreeable to issuing lien waivers at each billing stage.

Analysis for question 4:

Keystone Community Bank agreed that the model would work but added that a title company needs to be employed to support the bank in the disbursement of funds as the bank had no in-house competence for the same. National City Bank agreed that the model would work, but added that there must be an arrangement so that the owner and the contractor hold the bank harmless in any liabilities arising out of the trust fund account. (The hold harmless arrangement in this case, whether given by the owner or the contractor indemnifying the bank, appears to circumvent the requirement of a state statute such as trust funds, and its validity may have to be verified by a competent attorney).

Bank One agreed that the model could work, but had a concern that the bonding company might preclude the right of the bank as a third party beneficiary. (On subsequent verification with Mr. David Holzworth of CNA Surety Company, it was clear that the bank, could be assigned as the co-obligee in the bond, thus guaranteeing payment of the banks money and the consequent workability of the model). Comerica and Standard Federal stated that the model might work but made their opinion contingent upon legal advice. Thus, we see that though varied concerns were highlighted, a majority of the banks (three out of five) believed that the model could work.

#### Analysis for question 5:

The interest rate charged by banks for such transactions varied from prime plus one (4.75+1) charged by National City bank to Prime plus three (4.75+3) charged by Comerica and Bank one. Thus, total interest costs on the funds remain in the range of 5.75 to 7.75%. This is much lower than the interest rates (20%) assumed in the calculations shown in Table 5, 6 and 7 which validates the 20% interest rate as an error on the safe side. A lower interest cost in-turn implies higher profitability and higher growth for the contractor's company.

#### Analysis for question 6:

The management fees charged by banks for such transaction vary from ½% percent at the low end by Bank One to 1½% charged by National City at the high end. All the bankers have also indicated an out of pocket expense of \$500 to \$1000 per disbursement, which cannot be quantified on a percentage basis. However, considering that a small project might be a million dollars worth, with four stages of payments, the percentage of this expense at \$1000 per disbursement works up to 0.4%. Thus, adding this to the total

interest expense we have a total interest and bank management expense not greater than  $7.75+1.5+0.4=9.65\%$ . This is less than half the interest expense considered in the calculations in Table 5, 6 and 7. Thus we see that there is ample cushion for profitability and growth in the simulated calculations. This validates the growth forecast using the project finance method.

#### Analysis for question 7:

National City, Comerica and Bank One all require a minimum of three consecutive years of successful operation of the contracting firm before they could consider financing it. However, conservative banks, such as Keystone Community and standard Federal, would require the contracting company to have completed at least five consecutive years of successful operation. Thus, we see that the majority of the banks (three out of five) required at least three years of successful operation. Hence, choosing at least five consecutive successful years of operation prior to approaching the bank for project based financing considered in Tables 6 and 7, stands validated.

Overall, given that all five banks answered affirmatively to four of the questions relevant to the workability of the model, the model stands validated from the banker's perspective.

#### 5.52 Validation of owner's contractual obligations

The questions posed to the owners and the number of owners who answered affirmatively or otherwise is tabulated in Table 9.

#### Analysis for question 1:

Three of the five owners, namely Miller Davis, CSM Group, and Wolverine Pipeline Company, who were private owners or represented private owners, were agreeable to making payments into the trust fund accounts. While Wolverine qualified it by stating

that the mechanism streamlines the payment to subcontractors, Miller Davis and CSM Group believed it makes no difference to the owners. Two of the owners, who represented the government, expressed an inability to pay into trust fund accounts. This could imply a limitation in terms of the trust fund mechanism being workable in government contracts. The above data validates the workability of trust fund mechanism for private owners, but puts a question mark on its workability for governmental owners.

#### Analysis for question 2:

All five owners named above agreed to the lowering of project completion risk. While the two governmental owners qualified their statements by citing 'Prevention of diversion of cash flow' as the reason, the private owner, Wolverine, added that the question cannot be treated across the board as at times non-payment of subcontractors is due to non-performance of a subcontractor. CSM Group cited the reason for their agreement as early receipt of lien waivers from the subcontractor. Miller Davis believes that timely payment of the subcontractor due to involvement of a third party in the trust fund lowers the project completion risk. Thus, the advantage of having a lower project completion risk in the proposed model stands validated.

#### Analysis for question 3:

Four of the five owners emphasized the need for having stage wise lien waivers for the jobs and qualified their stand by stating that they were practicing mandatory stage wise lien waivers already. One private owner, CSM Group, believed that their projects were not large enough to mandate lien waivers or payment bonds and hence did not feel they were necessary. However, as the majority of the owners were already mandating stage wise lien waivers, the same stands validated for the model.



**Table 9 – Responses of Owners to the Contractual Obligation of  
Project Finance Model**

S.No	Given the contractual arrangement	YES	NO
1.	As owners, will it be acceptable for you to pay all bills raised by your contractor into a trust fund account?	3	2
2.	Do you think that the safeguarding of a subcontractor's payment by routing it through a trust fund account lowers the project completion risk?	5	0
3.	Under the suggested contractual arrangement, do you see a necessity to mandate lien waivers at each billing stage until the completion of the project?	4	1
4.	Do you think lien waivers at each billing stage could result in lowering surety premiums and thus benefit your project?	5	0
5.	Is the assignment of a bank as the Third party beneficiary for all of your contractor's invoices objectionable to you?	0	4
6.	In the suggested contractual arrangement, do you think that the contractor will be incurring costs on insurance and payment bonds higher than what he may be incurring under existing contractual arrangement?	0	5
7.	Will the suggested model be acceptable to you and do you see it as serving your interests?	4	1

Analysis for question 4:

All five owners agreed that stage wise lien waivers result in lowering of surety premiums and qualified their statements by stating that their payment bonds already have the financial implication of stage wise lien waivers factored in their prices. Thus, lowered surety premiums due to stage wise lien waivers stands validated.

#### Analysis for question 5:

Four of the owners had no objection to the assignment of the bank as a third party beneficiary to the contractor's invoices and qualified their statements by saying that it made no difference to them. Besides they will be required to do so under article 9 of the UCC. One owner abstained from answering the question stating he was not competent to respond to the same. Thus, we see that a majority (four out of five) of the owners are agreeable to assigning the bank as a third party beneficiary. Hence, the aspect of assigning the bank as a third party beneficiary in the proposed model stands validated.

#### Analysis for question 6:

All five owners believed that insurance and bonding costs under the proposed model will not increase, but on the contrary will decrease due to lower risk in the set up. However, CSM Group believed the cost overrun might be the only additional insurance to existing arrangements. Hence, this lower effect of the total cost may be lost and the insurance and bonding costs may stay unchanged. The above data invalidates the assumption of an increase in insurance and bonding costs, and consequent growth and profitability calculations in Table 7.

#### Analysis for question 7:

Four out of five owners believed that the suggested model would be of use to them and served their interests. Although Miller Davis believed that the model might serve their interests, they were skeptical of the financial benefit of the model due to its newness. They believed there might be legal and administrative costs to consider. Wolverine pipeline believed that the model would serve their interests as there would be no lien on the property on project completion and there is scope for early completion of projects,

thus saving finance costs. CSM Group believed that the improved cash flow on the project would allow better performance by the contractor. One owner representing the government believed that due to the trust fund arrangement and the complexity, it may not be of use in government contracts. Thus, we see that on the whole, the model is acceptable to a majority (four out of five) of the owners and thus the acceptability of the model to the owners stands validated.

#### 5.53 Validation of contractor's obligations

The questions posed to the contractors and their responses are tabulated in Table 10.

**Table 10 – Responses of Contractors to the Contractual Obligation of Project Finance Model**

Given the contractual arrangement	YES	NO
Is it acceptable for your firm to receive your payment for your invoices into a trust fund account?	3	0
Is it agreeable for your firm to appoint your banker as the Third party beneficiary for all your invoices?	3	0
Is it agreeable for your firm to jointly operate this trust fund account with your banker for the disbursement of the funds?	3	0
Is it agreeable for your firm to purchase cost overrun insurance, Cost Cap, and other payment bonds, etc., to indemnify the banker who lends you money for the project?	2	1
Is it agreeable to your firm, not to extract the cash flow from any one project and let it run in isolation till the end of the project?	2	1
Would your firm have objections to issuing lien waivers at each billing stage?	0	3
Would your firm have objections to payment of the subcontractors from the trust fund account, while they give lien waivers at each billing stage?	0	3

Analysis for question 1:

While all three contractors agreed to receiving payment into the trust fund account, all three gave different reasons. ANCON believed, if it is a pre-requisite of the model, then they would not mind. Pro-Services believed that if lien waivers were there, it made no difference to the payment situation. Miller Davis believed that legal costs of operating trust fund accounts would have to be considered. Notwithstanding the diverse opinion stated above, it stands validated that trust fund accounts are acceptable to contractors.

Analysis for question 2:

All three contractors believed they had no option under the proposed arrangement, but to assign the bankers as third party beneficiaries if they were to secure the financing. Thus, the assignment of the banker as the third party beneficiary stands validated for the model.

Analysis for question 3:

All three contractors believed that they had no option but to agree for the joint operation of the trust fund account, but added that it was being done already for home loans. Thus, the viability of the joint operation of the trust fund account stands validated.

Analysis for question 4:

Two of the contractors, ANCON, and Miller Davis, were agreeable to buying such insurance and bonds' indemnifying the banker, as they believed that it is being done in some cases already. One of the contractors, Pro-Services, believed that they would be unable to secure such bonding and insurance. Thus, we see that majority of the contractors (two of the three) were willing to provide insurance and bonding required by the model. This validates the willingness of contractors to provide bonding and insurance as required by the model.

Analysis for question 5:

Two of the contractors, ANCON, and Miller Davis, were agreeable to desist from diverting the cash flow from the project, but only because the model mandates the same. Both made it clear that it was not their normal method of operation. One of the contractors, Pro-Services, was not agreeable as they said it was not possible for them to operate without mingling cash flows from various projects. Though it might be undesirable for the contractors, the majority of them (two out of three) were willing to fall in line with the requirements of the model; hence the agreeability of the contractors for desisting from cash flow diversion stands validated.

Analysis for question 6:

All three contracting firms had no objections to issuing lien waivers at each billing stage. Two of them, ANCON and Miller Davis, claimed that they were already doing the same, while Pro-services had no objection to issuing stage wise lien waivers if it was mandated. Thus, the practice of issuing stage wise lien waivers for the workability of the model stands validated.

Analysis for question 7:

All three contractors had no objection to paying subcontractors from trust fund accounts. They qualified the same by saying that stage wise lien waivers were in practice and hence the account from which the subcontractors were paid made no difference. Thus, we see that the requirement of paying subcontractors from trust fund accounts stands validated.

## 5.6 Model validation by “What If? analysis”

It becomes necessary due to the complex arrangement of engineering, legal and financial principles in the proposed model, to carry out a “What if? Analysis” to validate the model under various scenarios. The multitude of questions involved herein has been segregated under various topics and has been answered as delineated below.

### 5.61 Validation of model structure

1. What if? The contractor fails to perform the job? then who will perform the job and who will pay the bank?

Failure to perform by the contractor will result in the invoking of the performance bond by the owner under A-201 and the Surety company will step up to perform the job. As the bank will hold the lien waivers for their supply to the job, they will be covered under the payment bond given by the contractor to the owner.

2. What if the owner does not pay?

Non payment of dues by the owner will result in liens on the property and the property being attached by the courts. In cases where the owner dies, the liens on the property still have to be cleared before the property can be used or sold. In most cases, however, the projects are funded by banks that will pay directly to the contractor as in the case of a construction loan.

3. What if the subcontractor does not perform?

Liens are applicable on a job only upon performance on the job. If the subcontractor does not perform, he may not have lien rights (A-401). Further, subcontractor is a responsibility of the prime, who will have to get the sub contractor's scope completed.

4. How does the contractor's bank become eligible for holding the lien on the owner's property?

In the proposed model the bank is playing the role of the contractor's supplier, as the bank makes available credit for the contractor. The bank thus becomes eligible for holding lien rights on the owner's property.

5. What if, due to the nature of the project, the progress is nonlinear and results in an abrupt increase in working capital requirement, thus rendering the start-up money arrangement with the bank futile?

The anticipated cash flow for a project is a mandated tool for controlling any project. In this model the importance of accurate anticipated cash flow is underscored (Refer Item 4.2). The anticipated cash flow would form one of the bases for the bank to lend money to the contractor. Thus, the bank would be aware of the contractor's need and the lending would be structured accordingly.

6. What if the project cost overruns?

Cost overruns in a project attributable to the Architects are borne by the owner under contingency or cost overrun insurance. However, cost overruns incurred by the contractor have to be borne by contractors personally or they must have insurance for the same. In the event that cost overruns add value to the project, the owner could negotiate with the bank to advance a larger loan and have the bank fund the higher cost (Refer Item 4.6).

7. What if the contractor's project incurs a loss for some reason? How will the bank be indemnified?

If the contractor incurs a loss on the project, then automatically the contractor's margins on the project, available in the trust fund, would cover the loss. However if the losses are greater than the contractor's margins, the contractor may have to investigate the cause of the loss and either claim appropriate insurance or cover the loss from his other personal resources. Given the tight control mandated by the model, the risks of incurring losses are minimized.

8. What if the owner's architect rejects some material that has been paid for by the bank, but has not been paid for by the owner yet?

Most material is purchased as per specifications and rejections after inspection and acceptances by contractors are rare. In such cases the material would be under warranty and the contractor could revoke the warranty and have the material replaced by the supplier. However, in case of damage to the material, the contractor will have to bear the cost personally or through insurance.

9. What if the banker is not knowledgeable enough to understand the construction process in order to oversee disbursement?

The banker may have to use the services of a title company that renders such services for a nominal fee (Refer Analysis for question 4 from table 8).

10. What if AIA –A-201, A-301, A-311 and A312 are not the norm?

Differences between AIA and other forms of contract used by the owner may have to be pursued by the attorneys in the context of the proposed project-financing model, and suitable contractual arrangements would have to be made.

11. Why should the banker be assigned as a third party beneficiary to all of the invoices if the payment bonds already indemnify him?



If the banker is to receive payment of bills into a trust fund account jointly held by the banker and the contractor, then he may have to be assigned as the third party beneficiary to the contractor's invoices.

12. Why should an owner cooperate with a contractor with such an arrangement if he can find another contractor who can operate traditionally?

The contractor is in a position to negotiate with the owner, as he might be the lowest bidder. If, however, the legal costs of the proposed model to the owner are so high that when added to the contractor's bid, the cost equals that of the next highest contractor on the bid, then the owner may choose to go with the other contractor. Again, the owner has numerous hidden benefits in the proposed model in comparison with traditional ones. Hence, the owner might factor the same prior to deciding (Refer Item 5.2).

13. Why should the bank and subcontractors give stage wise lien waivers when A-201 does not mandate it?

Stage wise lien waivers have become the current norm, as validated by the survey outlined in the foregoing pages. Besides, stage wise lien waivers secure the owner and lower his surety premium for payment bonds (Refer analysis for question 4 from table 9).

14. If a contractor has a track record of having successfully and profitably executed projects, why should he agree to retention of his profit in the trust fund account?

The retention of the contractor's profit in the trust fund account offers added security to the banker, besides retaining the contractor's interest to complete the project as quickly as possible to recover his profits.

15. What if there is a labor strike?

A labor strike is considered as a ‘Force Majeure’ event and losses if substantial can be recovered under insurance<sup>33</sup>.

#### 5.62 Validation of proposed model against external relevant issues

1. The proposed model implies that the contractor will have to follow “Completed contract method” for accounting. The government does not easily permit this, hence it may not be possible to implement the model.

As tax paid to the government is an expense on the balance sheet, it will be possible to withdraw tax expense from the trust fund account. Due to the absence of co-mingling of multiple project cash flows, it will also be easy to calculate earnings at any given stage of the project. Hence, it will be easier for tax accounting and payment. The accuracy of declared earnings at any stage also minimizes the liabilities of tax look back attracted by construction companies. (Inputs by Mr. Thomas Georgeoff of Miller Davis Co)

2. What if the contractor has exhausted his bonding capacity in other projects?

While bonding capacity does place the upper limit on the capability of the contractor to take up bonded contracts, given the proposed arrangement, risk of contractor failure is low. Thus, a bonding company could consider increasing the bonding capacity of the contracting company, using such arrangements to execute projects. However, the bonding company could only decide the extent of increase in bonding capacity (Refer analysis for question 6 under table 9).

3. In allowing such tight control by the bank, is there not a risk of losing ownership of the contractor’s company?

While the bank has the right to sell their loans, they cannot sell an ownership stake in the contractor’s company. The buyer of the loan can only look to servicing of the loan. In the

event that the buyer of the loan is a large construction company looking to consolidate, then the contractor may face difficulties in working and may either refinance the loan through other sources or be bought out by the larger company.

4. Why should a bank lend without collateral or with minimum collateral when currently they seek and get collateral for their lending?

Contractors are the 'highest risk lending' for banks traditionally, due to non-availability of collateral with contractors and due to the volatility of their earnings (Robert Gray, Comerica Bank, Interview cassette). The proposed method secures the funds lent by the bankers, and this aspect provides an opportunity to exploit the huge 'contractor financing' market.

5. What if the legal costs are so high that the venture becomes non-viable?

Normally legal costs would be in the same perspective of the project value. Prudent attorney selection may be required based upon project value. Also, legal costs could be minimized if same or similar contractual arrangements are followed and the bankers do not change frequently.

6. What if a 'Force Majeure' event occurs on site and the material or works not paid for by the owner are lost or destroyed?

Contractors normally have contractors' all risk insurance, which will cover 'Force Majeure' events such as windstorms or fire. AIA-A201 mandates such insurance.

### 5.63 Mistakes and frauds

1. At times the banks may employ 'Title companies'. What if a Title company hired by the bank makes a mistake or defrauds and authorizes release of more money from the trust fund account?

On discovery of fraud or mistake the bank can move on the Title Company's insurance and recover losses. However, this will also tarnish the contractor's image. Hence it is in the interest of the contractor to be careful.

2. What if the banker and the contractor come in league and defraud the trust fund account together?

Penalties for defrauding trust fund accounts are severe in most states. Such fraud will also turn into a full-scale criminal case. The proposed model does not offer immunity against defrauding of trust fund accounts.

## **5.7 Anticipated Limitations**

- 1) The model may not work for government contracts as under question 1, Table 9, and item 5.5.2, two of the owners who represented the government expressed an inability to pay the contractor's invoices into trust fund accounts.
- 2) The model may not work for subcontractors attempting to use the proposed model to secure finance, as there would be two levels of indemnification involved and possibly three banks. The financial and legal costs of the model may also deem the model nonviable for subcontractors with very small turnover.
- 3) The proposed model requires the bank to employ construction related competence.

## 5.8 Conclusion

The questionnaire survey summarized in Tables 8, 9 and 10 in the foregoing pages validates the workability of the contractual arrangement stipulated in item 4.6. The various elements of the contractual arrangement for each of the parties was supported either unanimously or by a majority, as reflected in Tables 8, 9 and 10. Further each of the responses has been qualified by the interviewees and the same highlighted in items 5.5.1, 5.5.2 and 5.5.3, respectively. Finally the 'What if? Analysis' under item 5.6 answers some potentially vexing scenario, which can be avoided with the proposed arrangement.

Given the agreement of the various parties as outlined above, though pending legal approval, the proposed model stands validated in all its aspects. The assumption of increased insurance cost, which prompted a sensitivity analysis in Table 7, stands invalidated under question six of Table 9 under item 5.5.2.

Thus, given the advantages of project-based financing to the banks, contractors, and owners alike, it can be concluded that there is scope for the application of project-based financing to small and medium construction contracting. However, as outlined in this study, project-based financing requires a lot of attention to details and professional handling on the part of both the lender and the borrower, and may be limited in applicability to private contracts.

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