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Anatomy of the construction industry: competition in the year 2000

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Anatomy of the construction industry:
Competition in the year 2000

by

Subhransu Mukherjee

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of the
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# TABLE OF CONTENTS

ACKNOWLEDGEMENTS ............................................ ix

CHAPTER 1. INTRODUCTION .................................. 1

Objectives ...................................................... 2
Limitations of the Study .................................... 3

CHAPTER 2. DOMESTIC ALLIANCES ......................... 5

Introduction .................................................... 5
The infrastructure dilemma ................................. 5
Role of the government ...................................... 7
History of Privatization ..................................... 8
Privatization Defined ........................................ 9
Strategic versus tactical privatization .................. 10
Theories in Privatization .................................... 10
Economic Theories in Privatization ....................... 12
Steps in the Analysis/Decision Process ................ 14
Mechanics of Privatization ................................. 16
Privatization and Finance .................................. 17
Traditional Methods of Public Financing ................ 18
Alternate Financing Techniques ......................... 20
Forms/Methods of Privatization ......................................... 22
Issues In Privatization ...................................................... 24
  The rationale for privatization ........................................ 25
Objectives of Privatization ............................................... 26
  Competition in the privatization program ............................ 27
  The limited promise of privatization ................................ 28
International Issues in Privatization ................................. 30
  Developed countries .................................................. 30
  Developing countries ................................................ 31
Perspectives on Privatization ............................................ 33
Privatization: National Competitiveness and Future Trends ...... 35
  Highways and bridges ............................................... 36
  City streets ................................................................ 37
  Municipal water programs ........................................... 38
  Waste water programs ............................................... 38
  Solid and hazardous waste disposal ................................. 39
  Air transportation ...................................................... 39
  Ports and waterways .................................................. 40
  Prisons ...................................................................... 40

CHAPTER 3. INTERNATIONAL ALLIANCES ............................. 55
  The Global Dimension .................................................. 56
    Definition ................................................................ 56
    The multinational contractor ....................................... 57
    The foundations for global strategic management ............. 57
Elements of Global Strategy ....................................... 58
Risks In International Investment ................................. 59
  Risk definition and classification ............................. 60
  Risk management .............................................. 61
  The multinational contractor in perspective ................. 63
Build Own Transfer .................................................. 65
  Procedural aspects ............................................ 65
Feasibility Conditions For BOT ................................... 67
  Characteristics of BOT projects ............................... 68
Issues in BOT ....................................................... 69
  Advantages and disadvantages ............................... 69
  Ingredients for success ...................................... 70
  Risks in BOT projects ....................................... 71
  Trends in BOT ................................................ 73
Joint Ventures and Partnerships ................................ 73
  Definition and extent ....................................... 74
  Participation policies ....................................... 75

CHAPTER 4. RESEARCH METHODOLOGY .......................... 88
  Introduction ................................................... 88
  Phase 1: Literature Review ................................... 89
  Phase 2: Development of the Interview Guide ............... 89
  Phase 3: Development of the Interview Guide Matrix ...... 91
  Phase 4: The Interview Process ............................... 92
  Phase 5: Data Compilation .................................... 93
LIST OF FIGURES

Figure 2.1: Government spending on infrastructure resources (Rebuild America Coalition, 1988) .......................... 42
Figure 2.2: Key elements of a successful public-private partnership (Gunyou, 1985) .................................................. 43
Figure 2.3: Continuum of possibilities in privatization (Ramanadham, 1989) 44
Figure 2.4: A Typical decision tree analysis sequence (Steinborn, 1985) 45
Figure 2.5: Algorithm to determine sources of infrastructure financing (Rau, 1985) .................................................. 46
Figure 2.6: Public investment and national investment 1960-86 (Constructor, 1989) .......................................................... 47
Figure 2.7: Infrastructure spending by level of government (Rebuild America Coalition, 1988) ................................. 48

Figure 3.1: Declining trend of the U.S. construction market (OTA, 1988) 77
Figure 3.2: Extent of global influences on domestic business (Kolde, 1982, p. 15) .............................................................. 78
Figure 3.3: Criteria for global strategies (Davidson, 1982) .................. 79
Figure 3.4: A typical total risk management program (Ashley and Bonner, 1987; CII, 1989) .................................................. 80
| Figure 3.5: | Factors in the capital budgeting process (Davidson, 1982) | 81 |
| Figure 3.6: | Association tree for a typical BOT project (Renault, 1989) | 82 |
| Figure 3.7: | Influence diagram for risk allocation in BOT projects (Renault, 1989) | 83 |
| Figure 3.8: | Four major dimensions of a typical joint venture (Davidson, 1982) | 84 |
| Figure 5.1: | Predicted state of the economy | 107 |
| Figure 5.2: | Major concerns in international construction | 108 |
| Figure 5.3: | Chances of an energy crisis | 109 |
| Figure 5.4: | The emergence of global centers | 110 |
| Figure 5.5: | Trends in U.S. technological advantage | 111 |
| Figure 5.6: | Predicted labor situation | 112 |
| Figure 5.7: | Views on government regulation and control | 113 |
| Figure 5.8: | Global political stability | 114 |
| Figure 5.9: | Factors likely to influence competitiveness | 115 |
| Figure 5.10: | Factors leading to the loss of U.S. competitive advantage | 116 |
| Figure 5.11: | Industrial trends and project financing | 117 |
| Figure 5.12: | The anticipated role of trade unions | 118 |
| Figure 5.13: | Facing the future labor situation | 119 |
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table 2.1:</th>
<th>The privatization decision matrix (Scully and Cole, 1985)</th>
<th>49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 2.2:</td>
<td>An outline of the tendering process (Ascher, 1987)</td>
<td>50</td>
</tr>
<tr>
<td>Table 2.3:</td>
<td>Traditional methods to finance infrastructure (Government Finance Research Center, 1983)</td>
<td>51</td>
</tr>
<tr>
<td>Table 2.4:</td>
<td>Methods of privatization (Pirie, 1988)</td>
<td>52</td>
</tr>
<tr>
<td>Table 2.5:</td>
<td>Effects of privatization and competition (Swann, 1988)</td>
<td>53</td>
</tr>
<tr>
<td>Table 2.6:</td>
<td>Estimates of total infrastructural needs - 1987 (Rebuild America Coalition, 1988)</td>
<td>54</td>
</tr>
<tr>
<td>Table 3.1:</td>
<td>Key elements of a global strategy (Kolde, 1982)</td>
<td>85</td>
</tr>
<tr>
<td>Table 3.2:</td>
<td>Factors in foreign government negotiations (Davidson, 1982)</td>
<td>86</td>
</tr>
<tr>
<td>Table 3.3:</td>
<td>Major motives for joint ventures (OECD, 1986)</td>
<td>87</td>
</tr>
<tr>
<td>Table 4.1:</td>
<td>The interview trip matrix</td>
<td>94</td>
</tr>
</tbody>
</table>
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CHAPTER 1. INTRODUCTION

Ever since the beginning of this century, unrivaled domination of the world construction market has been the hallmark of the U.S. construction industry. The Marshall Plan for the rebuilding of Europe after World War II provided the impetus and scope for the U.S. construction industry to make significant and lasting inroads into the international construction arena. Through the mid-1970s, U.S. engineering and construction firms clinched far more international contracts than any other competitor. The capabilities and competence of the U.S. contractor were far superior than any other competitor in the international construction arena, having earned a reputation for supplying top quality construction methods, management and engineering technology, irrespective of the size of the project undertaken.

The 1980s ushered in a new era into the global construction scenario. In a predicament shared by numerous other firms in the manufacturing industry, the U.S. construction industry found the unprecedented entry of equally competitive new entrants in the global construction arena slowly but steadily eroding its ubiquitous and forceful presence. This precipitous decline in its share of the world market was aggravated by declining growth rates in developing countries, falling oil prices and the fiercely competitive nature of the construction companies of less developed and newly industrialized countries that have since come of age.
Over the past two decades, the U.S. construction industry has literally been struggling to maintain its status as the world leader in engineering and construction services. There is an urgent need to take stock of the situation at hand and devise competitive strategies to arrest and possibly reverse the slide. In this regard, an awareness of the forces that are likely to shape and influence future competitiveness in the global construction marketplace could not have been more imperative.

Objectives

The entry of construction firms from less developed and newly industrialized countries (LDCs and NICs) into the international construction marketplace generated considerable literature on competitiveness of foreign firms. However, a very limited amount of useful information is currently available on the nature and structure of international competitiveness in the construction industry. There is a dire need to generate information on the salient factors that affect international competitiveness: strategies, costs, financing, technology and management skills. The purpose of this research is to provide a broad-based insight into the future state of competitiveness, both domestic and global, by developing scenarios for the state of competition in the construction industry in the year 2000 and beyond. Historical and current trends are systematically analyzed to identify the driving forces that will shape the future of the construction industry. Specific research objectives include an in-depth study of:

- The shaping of corporate capabilities: vertical integration and horizontal expansion, to increase corporate capabilities and market share, including acquisition and mergers by offshore conglomerates and the acquisition of foreign firms by U.S. companies. This area would also include project teaming and partnering.
to develop and undertake future projects, and an enumeration of the requirements necessary to perform in the global marketplace.

- The role of privatization, build-own-transfer projects and the nature of project financing in markets of the future.

- Management, organization and structure: future management and organizational approaches/structures and techniques to attract personnel to act in a global environment.

This study is aimed at providing the construction industry with a predictive scenario encompassing the strategies that are likely to shape both domestic and global competition in the year 2000 and beyond, from a U.S. standpoint. The scenarios were developed based on an extensive literature review on pertinent subjects and a series of personal interviews with over fifty executives from contractor firms, engineering firms, owner firms, developers and government agencies. Within the limitations of the study, considerable attention was given to keeping the geographical, industry and sectoral extents as broad based and representative as possible. The interviews were intended to be “blue sky” or subjective in nature.

Limitations of the Study

The very foundation of the research project is based on the subjective opinions of a select group of top management personnel within the industry. The limitations of representation, personal bias and company policies on information exchange are clearly inherent under such circumstances. The constraint of time was an inhibiting factor for this research project, but as with most other research projects, this was a
constraint that had to be dealt with in the best possible manner. In addition, the end result of such a research project that is directed towards developing a predictive scenario is always subject to speculation and susceptible to a host of externalities that can radically alter the results. However, the authors believe that the problems, ideas and strategies presented in the study will be an insightful tool for members of the construction industry in helping them shape their corporate strategies for the future.
CHAPTER 2. DOMESTIC ALLIANCES

Introduction

Two political legacies of the 1980s are destined to have an overriding influence on the economic policies of the last decade of this century. One is a renewed enthusiasm for private enterprise and the other is a persistent deficit induced ceiling on government spending. The consequences of these two factors have led to enhanced claims for privatization - the provision of public services by the private sector (Donahue, 1989).

Over the last fifty years, privatization has attracted much attention, reflecting a global interest in decreasing the role of the state. This trend was essentially driven by severe financial constraints in the face of mounting debt and the social compulsion to provide public services (Kirkpatrick 1989; Swann, 1988).

The infrastructure dilemma

The U.S. infrastructure is in a critical stage of decay (Ibbs and Echeverry, 1988; Government Finance Research Center, 1983). The last 25 years have seen a dramatic reversal in the relationship between infrastructure investment and economic growth. Net public investment, as a percentage of gross national product, has in fact declined from a maximum of 2.3% in 1965-69 to 0.4% in 1980-84, as shown in Figure 2.1 (Re-
build America Coalition, 1988). Cohate and Walter (1983) estimate that government spending will have to amount to approximately $3 trillion, by 1995, to maintain levels of service comparable to conditions in 1983. However, only a third of the required allocation is being committed today (Ibbs and Echeverry, 1988). Despite substantial public investments during the 1960s, capital assets are suffering from years of neglect, overuse, deferred maintenance and delayed repairs. This predicament has come about primarily due to widespread policies of “divestment” at all levels of government (Government Finance Research Center, 1983).

The Keynesian principles, on which the U.S. economy is still being operated, where consumption is encouraged over saving and the global dimension is not adequately accounted for, has contributed to the debilitating condition of the economy. This is clearly reflected by the fact that prior to 1971, the U.S. never had a trade deficit, while the trade deficit today is over $750 billion (Burton, 1989). This dramatic build-up of external debt and collapse of the trade balance, are a result of massive federal budget deficits - consuming and investing more than what is being produced or saved. Figure 2.1 clearly shows the direct relationship between saving and investment rates and productivity. As shown, countries with the highest investment rates, as a percentage of gross domestic product are those with the highest growth rates - over the last 20 years, the 1.2% annual growth rate of the U.S. compares rather adversely with the 5.5% growth rate of Japan (Rebuild America Coalition, 1988). There is an urgent need to mitigate this situation, through a combination of reduced federal spending, selective increases in revenue, enhancing financial market regulations and promoting systematic international coordination. Evidently, the importance of “privatization” as a national imperative is clearly pronounced under such
Role of the government

According to Finley (1989) it is the duty of the government to decide what services citizens want and then provide them at prices that citizens are willing to pay. Of the services desired, some are best "produced" by the government, while others are better "arranged". Over the last two decades, and particularly in the last ten years, the responsibility for public services has been shifting away from the federal level to local government levels and from public to private sectors (Gunyou, 1985). Such partnerships between governments and the private sector have proven to be beneficial to both the private corporation as well as the community at large, resulting in a "win-win" situation for both parties. The key elements of such a partnership are (Gunyou, 1985):

- Mutual Interests:

  The existence and subsequent identification of the areas of mutual interest between the government and private sector is of paramount importance in such relationships. Both parties must understand and appreciate the objectives, capacities and constraints of the other sector and be fully cognizant of the advantages and disadvantages the partnership may entail.

- Roles and Responsibilities:

  A clear definition and demarcation of the roles and responsibilities of each party, with particular reference to organization, accountability and leadership.

- Feasibility Evaluation:
This component forms the most critical aspect of such relationships and typically encompasses three issues relating to risk-return analyses, namely: technical analyses, development potential and financial feasibility.

• Plan Development and Implementation:

After the initial stages of objective and feasibility considerations, it is important to develop a conceptual organizational approach, with detailed management, financial, and regulatory plans to effectively complete the project. The key elements of such partnerships and the interactions therein are shown in Figure 2.2.

**History of Privatization**

Privatization is not a phenomenon of the 1980s or a consequence of the financial panic thereof. Documented usage of the word dates back to the late 1960s (Drucker, 1978). In fact, Donahue (1989) reports that as far back as the mid-1950s, the Bureau of Budget issued directives dissuading federal agencies from producing any product or service that was already available from private enterprises. The policy was expanded and promulgated as “Circular A-76” in the late 1960s and became the forerunner of the present day trend. However, the financially and ideologically arbitrary theory gained considerable popularity, after an extensive and successful drive by the British towards privatization, under the Thatcher government in the 1980s. Johnson and Bennett (1981) and Savas (1982) influenced and introduced the practice to the federal government through their celebrated publications on the subject. It became a top federal government priority, in the years to follow, but fell short of the expectations
in terms of popularity and delivery throughout the 1980s. A presidential commission was set up to promote the concept of privatization. Three notable impacts of this movement, with significant bearings on the construction industry were in the areas of urban transportation, military support services and environmental cleanup, as detailed in the Superfund promulgations of 1981 and its subsequent enactments.

**Privatization Defined**

According to Kent (1987), Swann (1988) and Finley (1989), “privatization” refers to the transfer of functions, previously performed exclusively by the government, to the private sector, under conditions that typify the private sector. It encompasses two different functions, either or both of which could be privatized. This includes “provision” or authorizing, empowering and administering certain public demand service and “production” or the administrative action required to physically create or produce the service in demand. This, according to Kolde (1982), leads to four possibilities as follows:

1. Both functions are public.
2. Private production, public provision.
3. Private provision, public production.
4. Private production and provision.

The level of private participation increases, from both functions being public to both being private. Such public/private partnerships are aimed at being mutually beneficial to the enterprise, the government and the population at large, resulting in a “win-win” situation for all the parties concerned.
Strategic versus tactical privatization

The role of privatization can also be interpreted in two other ways, namely "strategic" privatization, or the process of shrinking the "collective realm" and "tactical" privatization, aimed at cutting costs through competitive pricing, using policies of the private sector. According to Donahue (1989), public managers look primarily for lower costs from privatization, realizing and accepting the fact that the risks often stay with the government while quality is not substantially improved.

Theories in Privatization

The concept of privatization is not limited to denationalization or liberalization and deregulation. According to Ramanadham (1989), it encompasses a deeper continuum of possibilities, as summarized in Figure 2.3.

Ownership measures represent sale of the government enterprise in part or full, with liquidation being the most extreme step towards privatization.

Organizational measures could typically include:

- Revamping the structure of a government where the intervention of the government is limited to top level management.

- Fragmenting a large monolithic government organization into smaller units or converting them into smaller, independent companies, without loss of economies of scale.

- Leasing out parts of the assets, while retaining overall ownership and absorbing the profits as arranged.
• By promoting competition within and without a large government undertaking through fragmentation, deregulation and promoting competitiveness on an incentive basis.

• Restructuring financially, by writing off accumulated losses or by limiting the extent of the enterprise to a homogenous segment of the commercial market.

Operational measures are most relevant to centrally planned economies. The measures to be adopted could be one of the following:

• Contracting out or acquiring a product or service from external sources, rather than producing it in-house.

• Adopting the incentive system for quality and quantity of work done, by all levels of employees, thus incorporating a traditional feature of the private sector into the public sector.

• Outlining specific investment criteria, with strict qualification standards, aimed at obtaining greater rewards for the same amount of money spent.

• Setting specific pricing principles, since privatization necessarily implies loss of monopoly.

• Setting specific targets for accomplishment in a given time frame, to be agreed upon by the private enterprise as well as the government.

• Requiring that capital funds be obtained from capital markets. This urges the functions of the privatized venture to be productive and attractive for investment by the public.
• Removing unproductive controls by the government in the operations of the privatized venture.

Economic Theories in Privatization

Any change in the type and level of ownership of an enterprise will foreseeably result in a change in the nature and extent of the relationship between the people responsible the decisions and those that benefit from the profits. This reality is an important issue during the process of privatization, where the potential and nature of change in the relationships between the agents, or managers of a privatized enterprise and the principals need to be appropriately analyzed. Difficulties generally arise due to conflicting objectives and dissimilar levels of information available to the two parties. In the privatization scenario, the private firm assumes the role of the agent or manager while the government is the principal, or stockholder. In such an arrangement, strong performance by the enterprise would be linked to enhanced share prices and poor performance to the threat of takeover. Under such circumstances, the following four theories need to be considered, prior to opting for privatization (Vickers and Yarrow, 1989).

In the operation of a typical private firm, the primary objective is maximization of profit. This function is performed by the agents on behalf of the principals, who are presumed to share the same objectives as that of the principals. Typically, the principals want the agent to act in a fashion that can be completely monitored. However, the agents being better informed, in terms of quality, quantity and timing of the information, or for reasons other than entirely noble, may act contrary to the expectations of the principals (Aharoni, 1988). As a consequence of this predicament,
the principals resort to post-facto monitoring by controlling the marketability of the common stock and initiating bankruptcy proceedings in the event of dismal financial performance.

In case of a publicly owned firm, the monitoring function rests with the government. The primary differences in a government-agent relationship in a privatization scenario, contrary to that of a private firm, are as follows (Giantris, 1989):

- The principals do not seek to necessarily maximize profits.
- There are no marketable common stock and therefore no market for corporate control.
- There is no direct equivalent of the bankruptcy constraint on performance.

The objectives of the government are usually guided by the "greater good for the majority" principle. This results in associating differential weights to the interests of the consumers, the agents and the principals. The actions of the government are particularly complicated by the fact that in obtaining a subsidy of $1, for the privatized enterprise, an amount, usually greater than $1 needs to be raised from other sources due to the transaction costs involved (Ascher, 1987). This affects the majority, as a result of increased taxes. Thus the managerial or agency incentive structure needs to be determined by taking into account the interactions between the degree of competition, the type of ownership, and the effectiveness of regulations. The interactions involved are far too complicated, involving a number of contributory factors. Consequently, an empirical optimum is determined, through a subjective trial and error process (Vickers and Yarrow, 1988).
Steps in the Analysis/Decision Process

Due to the increasing incidents of budget cuts, from state and federal allocations, local authorities are turning to innovative techniques for financing the construction and maintenance of the infrastructure and services (Scully and Cole, 1985). The implications of such trends to the construction industry, in view of its potential as a continuous source of opportunity, need hardly be emphasized. Privatization provides a cost effective alternative in the drive towards innovative financing. In selecting the type and degree of privatization, it is important to compare alternatives on the basis of risk and costs involved (Mitchell, 1990).

Steps towards privatization:

A typical privatization decision consists of five different options (Scully and Cole, 1985):

- Definition of Project Scope.
- Developing Options.
- Defining Engineering and Financing Assumptions.
- Estimating Costs.
- Analyzing Management and Risk Factors.

An overview of a typical decision matrix is shown in Table 2.1. Typically, each component of the decision matrix consists of a number of sub-parts that need to be analyzed on a case by case basis. Steinborn (1985) identifies six classes of decisions when planning and operating infrastructure systems. A characteristic “decision tree”
algorithm explaining the various interrelationships between the factors involved is shown in Figure 2.4. These include:

- At home decisions:

  Constitute the funding levels and sources that have to be obtained by a local government. With the present levels of deficit financing, federal funds would only become more scarce, forcing local governments to fund and finance local capital improvement projects. Historically, this arrangement has worked in the past, before the concept of revenue sharing existed and is likely to work in the future when needs arise.

- Introspection:

  In the uneasy scenario of deficit federal financing, the credibility of the local government in being able to raise funds through bond issues relies heavily on the trust and support of the taxpayers. In such a case, it would only be prudent to perform a self-evaluation by the local government, before issuing such bonds. An objective information transfer mechanism, together with an appropriate level of public relations promotion is clearly warranted.

- Finance:

  In the event of a lack of, or limited financial strength, financial decisions become extremely important. Typically these would include the level of taxes to be levied and the purpose for which the money would be used.

- Going Public:
Public participation programs are fairly routine in most infrastructure decision-making processes. These can be achieved by ad hoc meetings, conducted preferably by an engineer or planner, with involvement of all the agencies that are likely to be involved, namely, the government, the developer, the contractor, legal entities, representatives of the public, etc.

- **Legislation:**

  Depending on the size and nature of the local government, it may be difficult to recover appropriate levels of funding through legislative enactments. This agreement, where a legally elected public agency is empowered to raise funds, is an important decision on part of the local government.

- **Extent of Operations:**

  At this stage, a decision regarding the continued management of the constructed facility needs to be determined. Usually this is a political decision, based on the terms and conditions of the privatization proposal. Liability and maintenance costs are the two important factors in this decision, that need to be thoroughly evaluated.

### Mechanics of Privatization

Setting a price, to arrive at a “win-win” situation for all parties concerned in the privatization arrangement is a difficult task (De Escobar, 1988). This is particularly true in the case of developing countries where limits on transfer of public ownership is hindered by the lack of capital markets. In fact, the tendering process is often looked upon as an extension of the public sector procurement function and it remains the
responsibility of the government officials to effect the sale at an acceptable level (Ascher, 1987). However, as opposed to equipment or material procurement, the procurement of services is complicated by the fact that the outputs are not easily quantifiable, making both specification and monitoring difficult. A brief outline of the tendering process, including the key issues involved therein, is shown in Table 2.2.

Privatization and Finance

The provision of public facilities, for the benefit of all citizens, is usually the primary function of most state and central governments. Public capital projects are identified, analyzed and selected by the local government, through a procedure involving the following decisions (Government Finance Research Center, 1983):

- Capital Outlay or Capital Expenditure: Refers to the purchase of those physical assets that are expected to provide services over a period of time, usually exceeding one year.

- Capital Projects or Capital Improvement: Includes costs associated with the construction or major renovation programs of physical structures.

- Capital Budgeting: Is an annual process in which decisions regarding funding of specific projects, based on budgetary implications, urgency of need and sources of financing are made.

- Comprehensive Planning: Is concerned with development of long range plans of future land use. This is used primarily by local governments.
• Strategic Planning: Refers to the development of basic long term strategies that are aimed at making the best use of existing resources.

A number of alternatives are available to finance infrastructure development. These include both traditional as well as 'creative' financing methods. The municipal bond market is just one source of such funds. A number of creative financing techniques and combinations thereof, including lease financing, tax increment financing and pension fund financing can be adopted, to overcome the deficit financing situation (Ascher, 1987).

**Traditional Methods of Public Financing**

Issue of long-term bonds with 20 to 30 years maturity has been the traditional method used to finance capital improvement projects. The maturity period is generally selected to reflect the life of the project being financed. Generally two types of bonds are issued (Government Finance Research Center, 1983):

• General Obligation Bonds (G.O. Bonds): where the investors have the right to force the issuing authority to levy additional taxes to meet debt service payments, in case of default. Thus only governments with the authority to levy and alter the tax base may issue G.O. bonds.

• Revenue Bonds: which are secured by the revenues of a particular service, like sewerage charges, toll highways, rental income, etc. The revenue from the facilities are pledged to the investor. Since the source of funds to retire such bonds are riskier, the interest rate on such bonds are correspondingly higher. However, such bonds are particularly common, where due to lack of capital
funding or governmental guarantees, a developer or a construction company may opt for a revenue based return on their investment, particularly if the investment is attractive.

Short-term financing needs for capital projects may be met by issuing bonds, levying taxes or revenue anticipation notes. Although such financing techniques may reflect perceptive financial planning due to reduced interest rates, the threat of becoming overburdened with debt is always overbearing (Government Finance Research Center, 1983). Table 2.3 shows a brief outline of the issues concerning traditional financing methods.

Another approach to raising capital is a full range of fee systems. These include (National Water Symposium, 1983):

- **User Fees**: Include utility sales revenues that provide partial financing for new projects while providing an enhanced access to capital markets, since investors are more apt to invest in projects with assured revenues. Unlike user 'fees', user charges could also be levied, which represent payments for services directly related to use by the beneficiary, e.g., park admission charges (Toft, 1985).

- **Impact Fees**: These fees are mechanisms that make growth pay for itself, by forcing participation in the cost of new public facilities at the front end of the project. Most states require that these fees be directly related to the effects of a specific construction project, earmarked to remedy the impacts of the particular project.

- **Systems Development Charges**: Also known as improvement charges, these are levied on new development projects after they have been constructed.
• General Facilities Charges: Similar to system development charges, but used for overall maintenance and repair. These are used particularly in cases where the benefits will accrue to the entire service area.

• In lieu of Construction Charges: These charges allow the construction of the most desirable option, while ensuring private financial development, in a process where developers pay charges instead of building the system. Thus, the facility is publicly financed, without losing the private investment component.

• Latecomer Fees: Useful in areas requiring major reconstruction and upgrading, in the absence of substantial funding levels. Through an extension agreement, a locality can allow the developer to construct an oversized facility, that would be paid for by late comers' fees - those who develop in the area at a later date. Rau (1985) suggests an algorithmic approach to determine the beneficiaries and thereby the debtors of public service use, shown in Figure 2.5. This six-step approach includes identification of the impacts of the infrastructure, measurement of the impacts, determining costs and debtors of the impact, selection of funding mechanisms and finally implementation of a payment system.

Alternate Financing Techniques

Public and private pension funds represent around 16.6% of all capital market investments and form the single largest source of capital in the U.S. The estimated half million private, 6600 state and local government plans and 38 special federal worker retirement plans are expected to be worth around $4 trillion by 1995 (Government Finance Research Center, 1983). As a result of such size, pension funds exert a
major influence on the flow of investment capital. Historically these funds have been diverted to investments in the stocks and bonds of large corporations. Such funds are estimated to own enough stock to control the 1,000 largest industrial firms and the 50 largest non-industrial firms in the U.S.

A number of different techniques have been utilized in attracting this vast pool of pension funds. The methods employed to tap such resources constitutes the bulk of the “innovative” financing techniques, including compound coupon bonds, zero coupon bonds, industrial development bonds and tax exempt commercial papers (Yates, 1990, Government Finance Research Center, 1983). These methods are applicable for both international and domestic project financing.

Lease financing is an important technique for creative financing, used to meet local capital needs. Leases usually have low front-end costs wherein costs such as legal fees, printing charges, rating costs, advisory fees, etc., that are inherent in a bond issue, are eliminated. Such leases can be of the following types (National Water Symposium, 1983):

- **Straight Operating Lease**: The government acts as the lessee, with little room for negotiations.

- **Lease Purchase Agreements**: Aimed towards equity accumulation, such agreements, if properly structured, could be more efficient and less expensive than traditional bond issues.

- **Leveraged Lease Financing**: The owner-lessee provides some fraction of the equity, while paying the rest through borrowed sums. It would then be released, while the original lessee could still take advantage of tax benefits.
Certificate of Participation: Under such an agreement, the title and interest of the lessor is assigned to an escrow agent, with duties similar to that of a bond issue trustee.

**Forms/Methods of Privatization**

An inherent flexibility in its ability to manipulate worker incentives and reduce or stop an unwanted or unprofitable service, together with a superior understanding of economies of scale, enables a private enterprise to provide better services at less costs (National Water Symposium, 1983). Actual performance and delivery by private firms in providing public services has led to a rejuvenated interest in the concept of privatization, especially in light of the huge national deficit. Privatization may be achieved through complete transfer of ownership, including all subsidiaries, through a process often referred to as “hiving off”. It could also be effected without actual transfer of ownership of existing assets (Swann, 1988). Generally three basic forms of privatization are employed (Savas, 1990):

- **Divestment:**

  Refers to discarding an activity by the government. An ongoing activity is either sold or liquidated. Divestment can be either by sale, donation or liquidation (Pirie, 1988). Direct sale can be arranged in a number of ways, as shown in Table 2.4. Divestment may also be effected through donation of the enterprise to employees, users, customers or the public at large. Liquidating or selling off assets of a poorly performing activity is the last resort in the process, when chances of turning it around look bleak, since costs of continuation of the service will most likely increase the burden on the federal budget.
• Delegation:

Under such an agreement, the government delegates part, or all of, an activity to the private sector, while retaining the right to oversee the result (Manchester, 1989). Delegation can be carried out through contract, franchise, voucher or grant. Delegation by contract reflects the most common form of privatization in the U.S. and are typically used for waste management programs, street repair and maintenance, building maintenance, transportation, etc. Delegation by franchise requires the government to award exclusive rights to an organization to sell services to the public. Utilities, privatized urban mass transit systems and leasing of government properties are typical examples. Vouchers may be issued to eligible consumers, for services previously run by the state, like food, housing, health, transportation, etc. for purchase in the local marketplace. Lastly, the government may arrange a private entity to provide a necessary service, at subsidized rates.

• Displacement:

Displacement refers to a passive process in which the government is displaced gradually by the private sector, by default, accommodation or deregulation. Default refers to the entry of the private sector in the provision of a service when it recognizes obvious inadequacies in the services provided by the government. Poorly maintained public recreational areas are common examples of this form of privatization. Informal cooperation by the government and a private sector in providing a service that the government is unwilling or unable to provide refers to displacement by accommodation. The emergence of demand driven,
market-based arrangements that challenge the monopoly of the government as a result of deregulation leads to this form of privatization by displacement. In such an arrangement, the services provided by the private sector compete with those provided by the government in a competitive environment.

**Issues In Privatization**

Privatization, as a strategy to improve economic performance, is being embraced by both the East and West (Savas, 1990). In spite of differing political beliefs among nations, the fact that the government is expected to provide certain services remains a universal phenomenon. However, there is an increasing global trend towards reduced government involvement in the provision of even the most basic services. Among the reasons attributed towards such a move is the natural consequence of a monopoly system that leads to inefficiencies in government provision. A number of pressures drive this move towards privatization, including (Savas, 1990; Fitzgerald, 1988):

- **Pragmatic Pressures:** The compulsion the government faces as a result of poor performance. In such an event, the service provided by the government typically needs to be made more productive and privatization is an effective means of achieving this.

- **Ideological Pressures:** The pressures exerted by ideologists to prevent the government from becoming all powerful. Such pressures usually aim towards smaller, more efficient governments, requiring that governments spend more time governing and less time providing (Fitzgerald, 1988).
• Commercial Pressures: Routinely exercised by private tax paying businesses that support the opportunity for growth by providing services that a hard-pressed government may not be able to provide.

• Populist Pressures: Two elements of the populist belief that people should have a greater choice in public services and that they should be empowered to decide their common needs, without relying inordinately on distant bureaucracies has fostered an enhanced drive towards privatization. The proponents rationalize that privatization decentralizes power, strengthens traditional institutions and reinforces a local sense of community.

The rationale for privatization

Kent (1987) proposes four notable ideas for privatization, as follows:

• Full Cost Pricing: Those who want goods provided by the government should pay the full cost of having public goods and services provided for them. Usually in government accounting systems, the costs of depreciation, interests on borrowed finances, overhead costs are not accounted for, when charging consumers. Consumers are typically undercharged for the services rendered, which means that it is being financed through a different source. This violates the very fundamental economic theory that prices should be set equal to costs and consequently puts a drain on the exchequer.

• Competition: Production in the private sector that results from competition is likely to be more efficient and therefore less expensive. In the bureaucratic setup, prestige and power are related to size, not efficiency or competition. This
clearly violates the very essence of the concept of efficiency.

- Consumer Satisfaction: The consumer is likely to be more satisfied when given an opportunity to choose from a number of alternatives. The market is structured to accommodate a dissatisfied consumer by having alternative sources available. The political process, in its inherent disposition of being a monopoly, is not.

- Entrepreneurship: Under government monopoly, the entrepreneur is denied the opportunity to innovate and better meet the demands of the consumer of better service at a lower price. Privatization helps unlock the innovative genius of the entrepreneur.

Objectives of Privatization

According to Ramanadham (1989) and Van Oudenhoven (1989), the primary objectives of privatization include:

- Reduction of collective expenditure to reduce budgetary strains on the government that occur due to losses incurred by public enterprises, or their investment requirements, thereby making funds available for other uses.

- Enhancement of efficiency of the government apparatus through market discipline, reinforcement of competition by stimulating innovation and elimination of governmental intervention.

- Improving the allocational efficiency of investments by improving rates of growth and developing money markets.
A need to withdraw from activities most suited to private enterprise, thereby relieving administrative burdens on the government.

Widening indigenous ownership by encouraging equity distribution, enhancing productivity and commitment through incentive measures and employee stock ownership plans.

**Competition in the privatization program**

A decision regarding reshaping of competitive strategies and the need and extent for regulation of the privatized industry are two important issues that have to be addressed before the proximate issues pertaining to privatization are dealt with (Thompson, 1989). In case of a preexisting market, the market forces will determine and regulate competition, thereby requiring no specific public policy on regulation. Existence of competitive markets improve both productive and allocative efficiencies, as shown in Table 2.5 (Swann, 1988). Four possible combinations of public/private ownership and monopoly/competition are discussed.

- **Scenario A:** Corresponds to public ownership under conditions of monopoly. Lack of stimulus under such circumstances would lead to inefficiencies.

- **Scenario B:** Represents the operation of public enterprises under competition. In this case productive inefficiency is reduced due to product market competition, but still exists due to the absence of the threat of bankruptcy and the restraining effects of governmental interference.

- **Scenario C:** Monopoly under private ownership. Productive inefficiencies will exist due to lack of product market stimulus. However, the threat of going
bankrupt will exercise a moderating influence.

- Scenario D: Private ownership, with competition. Complete productive efficiency can be expected, since market competition is reinforced with tight market controls. In addition, the threat of bankruptcy and absence of governmental interference will cause the price being related to cost, i.e., allocative efficiency.

Three possible tracks leading to privatization are shown as I, II and III. Track I and track III involve changes in ownership, without change of product market conditions. Track III incorporates factors that improve efficiency, without any corresponding loss. Empirical evidence and intuitive reasoning suggest that track I would not achieve the objectives of the privatization program completely. Track II, privatization together with opening of the market to competition is, clearly the best line of action.

The limited promise of privatization

According to Hastings and Levie (1983), “privatization covers a multitude of sins” including:

- Selling off state holdings.
- Sales of physical assets of the government.
- Public issue of majority shares of a nationalized concern.
- Placement of shares with institutional investors.
- Joint public/private ventures.
• Introducing competition in an area where a public corporation had a monopoly market.

• Permitting private contractors provide services previously provided by the government.

• Arranging for private financing of large government project, with consequent loss of government equity.

Although privatization is aimed at improving efficiency, expanding the equity base and reducing the burden on the exchequer, the objectives are not always completely achieved. Hastings and Levie (1983), Carroll (1987) and Donahue (1989) report that the objectives of a privatization program are seldom achieved successfully. Inefficiency is often a stigma attached to a government-run organization, more due to the very nature of it being a government-run organization (Donahue, 1989). It is important to realize that public enterprises also have a social function to perform. Equity distribution, as a consequence of privatization is often misinterpreted, since overall control remains with the majority shareholder, no matter how small the percentage of holdings (Hastings and Levie, 1983). Usually only successful public enterprises are privatized. Thus, apart from losing revenues from successful enterprises, the government is usually stuck with unprofitable organizations. Finally, most privatized ventures will tend to operate only in certain profitable sectors, thus completely obviating the social responsibility of the government (Donahue, 1989).
International Issues in Privatization

Macroeconomic planning and management, with increasing levels of government involvement had been the mainstay of world-wide economic reform over the last fifty years (Hanke, 1985). This is particularly true of developing countries that attempted to achieve growth either through nationalized industries or through operation of private markets and firms. However, present trends indicate that government involvement in national economies are steadily decreasing, through deregulation, sale of government owned assets and privatization. This trend appears to hold true for both developed as well as developing countries (Hanke, 1985).

Developed countries

In most developed countries, privatization of a public sector enterprise is often a political decision, determined by those controlling and formulating government policies. By providing superior quality of service at less cost to the taxpayer, privatization allows a legislator to satisfy the service needs of a local constituency, without having to raise taxes (Butler, 1985). In such economies, the underlying issue in a privatization program is between competition (private) and monopoly (public production) (Waters, 1987). Often, the size of the government and its involvement in innumerable projects is quoted as a reason for privatization (Poole, 1985).

However, even among developed countries, the approach to privatization is looked upon differently. As opposed to the philosophy of "selling off the state" in the U.S., privatization in the U.K. is thought of as a comprehensive proposal, with four identifiable areas of government activity (Pirie, 1985):
• State industries.

• State services.

• State utilities.

• Regulatory procedures.

However, certain denominators common to almost all developed countries have given rise to the trend towards privatization. While financial inadequacies in meeting social responsibilities in the role of government as a "provider" is the most important cause, certain additional factors play an important part, including (Pirie, 1985):

• The fact that work done by a public enterprise costs around 40% more than if it were done privately

• Public enterprises have been found to be less efficient than the private sector

• The public sector is usually severely undercapitalized, since most funding decisions are based on electoral, rather than economic considerations

• The public sector is habitually lethargic in responding to changing times and needs

Developing countries

The tendency towards privatization in developing countries is primarily a result of two factors:

• Poor performance by public sector enterprises.
• A severe shortage of capital.

However, privatization does not necessarily ameliorate the financial enigma of the government. In most cases, losses incurred by such an organization are usually written off and continue as public debt, with minimal chances of being serviced. On the other hand, sale of the enterprise will derive a price that only reflects the loss in net worth of the enterprise and will not recover the government’s investment (Heath, 1989). As such the burden of servicing the debt remains the onus of the public exchequer (Ramanadham, 1989). In addition, enterprises with certain “social” obligations and those that the governments have to retain majority share holding for policy reasons cannot be privatized, even in the event of staggering losses.

Under such circumstances, decisions that influence privatization have been found to vary for each country (Ramanadham, 1989). Decisions based on categorization of public enterprises as “to be retained”, “objectives satisfied and therefore should be discontinued” and “will function better as a private firm” are common in some of the African countries (Stren, 1988, p. 122). Sectoral demarcations, involving decisions based on importance of the industry to the economy and its possible effects if privatized, are routine in most small economies. Ramanadham (1989), Hanke (1985), and Commander and Killick (1988) identify certain issues affecting the decision to go private. A summarized compilation of their observations are detailed below:

• Country Issues:
  
  Socio-economic condition of the country and its effects on national policies.

  Unique regional features.

  The role and extent of foreign assistance.
• Macro Issues:

  Distributional impacts of privatization to identify potential losers and beneficiaries.
  Preference in ownership of capital and techniques of share allotment.
  Attitudes of the labor force, managers and civil servants who would be affected by the decision to go private.
  Policies on liberalization, foreign ownership, level of dependence on private capital and national development and planning.

• Financial Matters:

  Impacts of debt servicing by the public exchequer, including sale of profitable enterprises, maximizing sale proceeds, restructuring costs, tax waivers, etc.
  Valuation and underwriting costs.
  Legal provisions, including liability, royalties, conversion of equity holding, etc.
  Procedures for utilization of income from the sale of the enterprise, with debt servicing and tax subsidy plans.

• Strategies:

  Level and methods of privatization.
  Defining roles and affixing levels of responsibility, including deregulation procedures, time frame decisions and procedures for monitoring efficiencies.

Perspectives on Privatization

Deregulation and tax rebates seem to have had limited effects in the drive towards the privatization movement in the U.S. (Linowes, 1988). An emerging global economy
with signs of intense competition and the need for shrinking the size and influence of the government by certain interest groups seem to be the primary driving force towards privatization (Linowes, 1988; Burton 1989). The forces of world economic competition have forced a rethinking of national strategies, to reduce the burden of the federal government, directing all efforts towards reducing the burden on taxpayers, without denying any service (Babai, 1988). Extensive privatization programs are to be found in almost all Western European countries that set out to emulate the British experience. However, the actual implementation of such plans in other European countries has been somewhat sluggish. Burink (1987) identifies four global incentives for privatization in developing countries:

- Development of stabilization programs by the International Monetary Fund (IMF), for countries with balance of payment problems, that tend to favor the export sector and push resources in the direction of the private sector.

- The bias of the World Bank towards private enterprise.

- Changing emphasis on developmental policies, priority being given to export expansion, diversification and growth of private enterprises.

- A more positive view on the role of multinational enterprises.

The process of privatization requires skills that are normally not found in either a private or a public enterprise. Large scale restructuring of the enterprise becomes necessary, with the objectives and principles of the enterprise being somewhat nebulous. In both, developed as well as developing economies, privatization is fast becoming a vital necessity (Waters, 1987). According to a recent study conducted by the Reason
Foundation, at least 65 countries in six continents were reported to have initiated privatization programs of some sort and this trend is rapidly increasing.

**Privatization: National Competitiveness and Future Trends**

The fact that many U.S. industries are losing their competitive edge to international competitors is an appalling reality. Once far ahead of major competitors like Japan, West Germany and other industrialized countries of the Group of Seven (G-7), U.S. productivity and annual growth rate output has declined sharply (Aschauer, 1989).

Many new and innovative remedies have been proposed to mitigate this dilemma, including management techniques, flexible manufacturing, education, research and development (Rebuild America Coalition, 1990). The underplaying of the role of basic infrastructure facilities in providing support for economic development has led to the economic downturn. Figure 2.6 shows the proportional relationship between public investment and private investment among the G-7 countries. Evidently, Japan with the highest rate of public investment also enjoys the highest levels of private investment (Aschauer, 1989). According to a report in Constructor (1989, p. 25), America now ranks 55th in the world in capital investment in infrastructure. In addition, as shown in Figure 2.7, infrastructure spending is becoming increasingly localized, with decreasing levels of state and federal government support (Rebuild America Coalition, 1988). As a result, many communities contract out public services to the private sector. Recent trends indicate that the annual dollar volume of public/private ventures has nearly quadrupled since the mid-seventies (Warren, 1985). Nearly every type of public works related to construction is affected by this
trend. Table 2.6 shows estimated dollar needs for public services, for the next 20 years. With decreasing levels of federal and state spending, the importance and the potential role of privatization in financing the rebuilding of the infrastructure and the inevitable role of the construction industry need hardly be emphasized. Aggressive strategies towards more flexible state and federal government mandates in allowing cost effective methods of compliance, accelerated by financing through private trust funds and other privatization measures, to augment federal financing, are clearly stated, in a recent report by the National Council on Public Works Improvement (Rebuild America Coalition, 1988). Infrastructure project financing, generation of public finance vehicles, new legislations affecting grants, loans and taxes, both in the domestic arena as well as in the international marketplace will undoubtedly be the issues facing the construction industry in the future. According to various government reports, the estimated 1.1 trillion to 3 trillion requirement in infrastructure funding would translate to between $11,000 and $30,000 in new taxes or debt to every taxpayer (Fitzgerald, 1988). Relevant aspects of each of the areas detailed in Table 2.6 are discussed in further detail.

**Highways and bridges**

The extensive network of roads and bridges constitutes the basic investment underpinning of the national economy. The nation's mass transit systems, owned and operated wholly by the government qualify for wholesale bankruptcy, with deficits exceeding over $6 billion per year (Fitzgerald, 1988). The highways and bridges continue to deteriorate at an alarming rate, requiring extensive maintenance procedures, that have been stalled due to unavailability of funds. According to a survey conducted
by the Federal Highway Administration of the U.S. Department of Transportation, nearly 130,000 highway miles and 135,600 bridges are considered structurally deficient, with nearly 103,000 bridges being functionally obsolete. In spite of increases in federal and state gas taxes to finance highway construction, operation and maintenance, the spending has fallen short of the need, particularly in high-growth urban and suburban areas (Constructor, 1989, pp. 34, 38).

City streets

The idea of eliminating underutilized roads and bridges from the city maintenance inventories and using the funds generated to refurbish the more used thoroughfares was first pioneered in the state of Texas (Fitzgerald 1988). In 1984, the Texas Transportation Corporation Act was passed that provided attractive incentives for private participation in highway development. Road construction was financed using tax exempt bonds. Ever since the introduction of the incentive system, a number of association of developers and financiers were formed who contributed to the construction of major thoroughfares and assumed responsibility for their maintenance. In fact, as reported by Fitzgerald (1988), every new facility built in the last five years in the Dallas area has had some extent of private participation. The importance of such programs is further pronounced, since owners are willing to contribute to the expansion and improvement of roadways, given the tradeoff involved in terms of enhanced property values.
Municipal water programs

Many public water supply systems are plagued by underpricing, inability to meet federal health standards, with deteriorating storage and distribution systems. The growing concern for public health led to additional federal requirements for filtration, disinfection and lead removal from public drinking water facilities. This would entail an estimated annual expenditure of over $7 billion over the next 20 years in regulating replacing and repairing water distribution systems (Rebuild America Coalition, 1988). Mandatory cost-sharing procedures as mandated by the Water Resources Act of 1986 (Wentz, 1989) and an inevitable increase in water rates are looked upon as potential sources of funding such municipal water programs.

Waste water programs

Despite a $44 billion investment in sewage treatment, by the federal government, since 1972, water quality has not improved to acceptable standards. The need to clean up the nation’s rivers, bays and streams continues to be a top priority national demand. These needs include facility requirements for secondary treatment, advanced treatment, infiltration/inflow correction, replacement/rehabilitation services, new collector sewers, new interceptor sewers and combined sewer overflows (Constructor, 1989). A 1987 study by the Associated General Contractors of America estimates an average annual expenditure of nearly $30 billion for such facilities. State revolving loans, coupled with increased regulations against pollution and groundwater contamination are being considered as viable means to fund waste water management (Rebuild America Coalition, 1990).
Solid and hazardous waste disposal

In spite of a five-fold increase in funding for site clean-up and remediation since 1986, only a small fraction of the two tons of hazardous waste generated every day is being safely disposed. Ninety-five percent of the 450,000 tons of solid waste generated every day are disposed off in landfills, that are being consumed at an alarming rate. The Environmental Protection Agency (E.P.A.) estimates that annual solid waste production would increase to around 193 million tons by the year 2000. Around a third of the approximately 6000 solid waste disposal facilities are expected to be exhausted by 1993.

More than 1200 of the 30,000 hazardous waste sites have been identified as possible Superfund sites, with estimated costs of remediation in the range of $30 billion. Even at the current pace it would take around 13 years to start construction on the already identified National Priorities List Sites. This list is expected to grow to around 2,100 sites by the year 2000, with an average cost of construction in the range of $25 million. Contractors will undoubtedly have to play a major role in the clean-up process and are likely to view the hazardous waste industry as a major growth market of the 1990s (Deery, 1989). The introduction of innovative technologies, together with more stringent disposal regulations aimed at waste elimination, rather then “end-of-pipe” need to be initiated. Minimization and recycling should be considered as possible solutions to the problem only in the event that waste generation is inevitable.

Air transportation

At an estimated annual growth rate of between 5 to 9%, in passenger miles traveled, rapidly increasing congestion in the air-traffic system is a major concern that
the federal government is faced with. The Federal Aviation Administration estimates that that 58 airports will be classified as being “seriously congested”, by the year 2000, affecting nearly 76% of the traveling population. Not a single major airport has been constructed for the last 15 years. There is an urgent need to improve the situation starting immediately, since complete construction of an airport facility typically takes approximately 10 years to complete. The Federal Aviation Administration estimates $11 billion in capacity expansion needs between 1991 and 1995.

**Ports and waterways**

Ports and waterways constitute the major medium for transportation for U.S. agricultural, industrial and consumer goods. Over the three-year period extending from 1985 to 1988, there has been a 50% increase in exports and a 28% increase in imports, in terms of dollar volume. An increase in vessel sizes involved in water borne commerce over the last 15 years has led to a need for deeper ports and waterways. Currently only a few ports on the west coast are deep enough to handle fully loaded commercial vessels. An estimated $40 billion investment is required within the next 10 to 15 years to dredge and rebuild the ports and waterways system (Constructor, 1989).

**Prisons**

Almost all the nation’s prisons are overcrowded, at an average rate of approximately thirty-three percent. The incarceration rate has nearly doubled since 1980, requiring estimated expenditures to the tune of nearly $28 billion in construction and operating expenses. States are estimated to have spent $5.5 billion and the local
counties, $3.5 billion for prison-related construction in 1988-89. State spending is expected to rise to around $7 billion in 1990-91 (Constructor, 1989; Rebuild America Coalition, 1988).

Given the state of the infrastructure and the investment requirements, the role of privatization and the construction industry need hardly be emphasized. Among potential solutions being considered for the rebuilding process, those that are likely to have a direct bearing on the construction industry include (Constructor, 1989, p. 73):

• Increased taxes.
• A less restrictive monetary policy.
• Better management, scheduling and planning at the federal and local government level.
• Increased user fees.
• Improved access of smaller communities to national money markets.
• Innovative financing tools, like pooled loans, development banks and earmarked taxes.

Rep. Lee Hamilton’s quote in the Constructor (1989), “You cannot have economic development in America unless you have sound infrastructure”, best summarizes the need and urgency for an increased contribution to the U.S. infrastructure. Under the present circumstances, it appears that almost all of the above options will need to be adopted to rebuild the U.S. infrastructure. Privatization clearly offers a potentially viable if not the only practical solution in this endeavor.
Figure 2.1: Government spending on infrastructure resources (Rebuild America Coalition, 1990)
Figure 2.2: Key elements of a successful public-private partnership (Gunyou, 1985)
Figure 2.3: Continuum of possibilities in privatization (Ramanadham, 1989)
Figure 2.4: A typical decision tree analysis (Steinborn, 1985)
Figure 2.5: Algorithm to determine sources of infrastructure financing (Rau, 1985)
Figure 2.6: Public investment and national investment 1960-86 (Construct...
Figure 2.7: Infrastructure spending by level of government (Rebuild America Coalition, 1988)
Table 2.1: The privatization decision matrix (Scully and Cole, 1985)

<table>
<thead>
<tr>
<th>Ownership Options</th>
<th>Public #1</th>
<th>Public #2</th>
<th>Private (Full Service Contract)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing Options</td>
<td>General Obligation Bonds</td>
<td>General Obligation Bonds</td>
<td>Industrial Development Bonds</td>
</tr>
<tr>
<td></td>
<td>Revenue Bonds</td>
<td>Revenue Bonds</td>
<td>Commercial Financing</td>
</tr>
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<td></td>
<td>Tax Exempt Lease</td>
<td>Tax Exempt Lease</td>
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</tr>
<tr>
<td>Design Construction And Operation Options</td>
<td>Conventional 3 Step Approach Municipality Responsible For Design, Construction and Operation</td>
<td>Private Firm or Joint Venture Responsible for Design, Construction and Operation</td>
<td>Private Firm or Joint Venture Responsible for Design, Construction and Operation</td>
</tr>
</tbody>
</table>
| Financial, Engineering Assumptions | * Size of facility  
* Construction Costs  
* Operating Costs  
* Interest Rates  
* Term of Finance  
* Buy Out Provision | * Total Annual Costs  
* Cost Per Unit | |
| Cost to City                |                                               |                                               |                                 |
| Management And Risk Analysis |                                               |                                               |                                 |
|                            | * Use of Debt Capacity  
* Total time For Project  
* Performance Risk  
* Legal Complexity  
* Labor Compatability | |

19
Table 2.2: An outline of the tendering process (Ascher, 1987)

<table>
<thead>
<tr>
<th>NO.</th>
<th>STAGE</th>
<th>KEY ISSUES/ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-tender</td>
<td>Organizational Responsibility</td>
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<td></td>
<td></td>
<td>Tendering Policies</td>
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<td></td>
<td></td>
<td>Staff Consultation Procedures</td>
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<td></td>
<td></td>
<td>Type of Contract</td>
</tr>
<tr>
<td>2</td>
<td>Contract Preparation</td>
<td>Conditions of Tender</td>
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<td></td>
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<td>Contract Document</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specification</td>
</tr>
<tr>
<td>3</td>
<td>Invitation to Tender</td>
<td>Type of Invitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Site Visits</td>
</tr>
<tr>
<td>4</td>
<td>In-house Tender Preparation</td>
<td>Staff Involvement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Avoidable Costs</td>
</tr>
<tr>
<td>5</td>
<td>Adjudication</td>
<td>Capability Assessment</td>
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<td></td>
<td></td>
<td>Technical Assessment</td>
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<td></td>
<td></td>
<td>Financial Appraisal</td>
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<tr>
<td>6</td>
<td>Contract Implementation</td>
<td>Terminating In-house Provision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contract Commencement</td>
</tr>
<tr>
<td>7</td>
<td>Monitoring</td>
<td>Responsibility and Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type of Monitoring System</td>
</tr>
</tbody>
</table>
Table 2.3: Traditional methods to finance infrastructure (Government Finance Research Center, 1983)

<table>
<thead>
<tr>
<th>Description</th>
<th>General Obligation Bonds</th>
<th>Revenue Bonds</th>
<th>Short Term Borrowing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Backed by the full faith of the issuing government, against a pledge of levying additional taxes to retire the bonds.</td>
<td>Principal and Interest payments are made from earmarked earnings of a utility. No tax pledges are made.</td>
<td>Instruments with less than one year of maturity, pledged by bonds, tax or revenue anticipation notes.</td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>Used to finance capital projects to be paid for by present and future residents who benefit from the facility.</td>
<td>Used to provide front-end financing for projects that pay back over their useful life.</td>
<td>To take advantage of lower short-term rates at the start of a project. Also used cash flow emergencies.</td>
</tr>
<tr>
<td><strong>Market</strong></td>
<td>Traditional, tax-exempt borrowing.</td>
<td>Project dependent, risky.</td>
<td>Short term investment instrument.</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Complex credit analysis. Requires voter approval. May result in increased taxes. Subject to debt ceiling.</td>
<td>Higher interest costs. Contain restrictive covenants, which may restrict operations. Lesser marketability than GO bonds.</td>
<td>Possibility of becoming overburdened with short term debt. Increases issuer's risk for the use of bond anticipation notes.</td>
</tr>
</tbody>
</table>
Table 2.4: Methods of privatization (Pirie. 1988)

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Selling the whole by public share.</td>
</tr>
<tr>
<td>Two</td>
<td>Selling a portion of the whole operation.</td>
</tr>
<tr>
<td>Three</td>
<td>Selling parts to private buyers.</td>
</tr>
<tr>
<td>Four</td>
<td>Selling to workforce or management.</td>
</tr>
<tr>
<td>Five</td>
<td>Giving to the workforce.</td>
</tr>
<tr>
<td>Six</td>
<td>Contracting out to a private business.</td>
</tr>
<tr>
<td>Seven</td>
<td>Diluting the private sector.</td>
</tr>
<tr>
<td>Eight</td>
<td>Buying out existing business groups.</td>
</tr>
<tr>
<td>Nine</td>
<td>Charging for the service.</td>
</tr>
<tr>
<td>Ten</td>
<td>Setting up counter groups.</td>
</tr>
<tr>
<td>Eleven</td>
<td>Deregulation via private associations.</td>
</tr>
<tr>
<td>Twelve</td>
<td>Encouraging alternative institutions.</td>
</tr>
<tr>
<td>Thirteen</td>
<td>Making small scale trials.</td>
</tr>
<tr>
<td>Fourteen</td>
<td>Repealing monopolies to let competition grow.</td>
</tr>
<tr>
<td>Fifteen</td>
<td>Encouraging exit from state provision.</td>
</tr>
<tr>
<td>Sixteen</td>
<td>Using vouchers.</td>
</tr>
<tr>
<td>Seventeen</td>
<td>Admitting demand pressures.</td>
</tr>
<tr>
<td>Eighteen</td>
<td>Curbing state powers.</td>
</tr>
<tr>
<td>Nineteen</td>
<td>Applying closure proceedings.</td>
</tr>
<tr>
<td>Twenty</td>
<td>Withdrawal from activity.</td>
</tr>
<tr>
<td>Twentyone</td>
<td>Right to private substitution.</td>
</tr>
</tbody>
</table>
Table 2.5: Effects of privatization and competition (Swann, 1988)

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Public Ownership Scenario A</th>
<th>Private Ownership Scenario C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monopoly</td>
<td>1. Productive inefficiency due to lack of product market competition allied to</td>
<td>1. Productive inefficiency due to lack of product market competition.</td>
</tr>
<tr>
<td></td>
<td>2. Absence of bankruptcy incentive and to</td>
<td>2. Is reduced (in varying degrees) by market for corporate control and by</td>
</tr>
<tr>
<td></td>
<td>3. Inhibiting effect of government interference.</td>
<td>3. Presence of bankruptcy incentive and by</td>
</tr>
<tr>
<td></td>
<td>4. Project related to cost (an allocative efficiency objective) but AC** &gt; minimum attainable due to 1-3 above</td>
<td>4. Absence of government interference.</td>
</tr>
<tr>
<td>Competition</td>
<td>Scenario B</td>
<td>Scenario D</td>
</tr>
<tr>
<td>Competition</td>
<td>1. Productive inefficiency reduced due to presence of product market competition but</td>
<td>1. Production efficiency due to:</td>
</tr>
<tr>
<td></td>
<td>2. Productive efficiency may not be maximized due to lack of bankruptcy incentive allied to</td>
<td>2. Presence of product market competition</td>
</tr>
<tr>
<td></td>
<td>3. Inhibiting effect of government interference.</td>
<td>3. Market for corporate control (variable in effect) and</td>
</tr>
<tr>
<td></td>
<td>4. Price related to cost but AC &gt; minimum attainable due to 2 and 3 above.</td>
<td>4. Presence of bankruptcy incentive and</td>
</tr>
<tr>
<td></td>
<td>** Actual Cost</td>
<td>5. Absence of government interference.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Price related to cost and AC at a minimum - i.e. both allocative and production efficiency.</td>
</tr>
</tbody>
</table>
Table 2.6: Estimates of total infrastructural needs: 1987 (Rebuild America Coalition, 1990)

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Investment $ Billion</th>
<th>Investment Time Frame Years</th>
<th>Annual Investment $ Billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potable Water</td>
<td>142.60</td>
<td>20</td>
<td>7.13</td>
</tr>
<tr>
<td>Wastewater</td>
<td>552.80</td>
<td>20</td>
<td>27.60</td>
</tr>
<tr>
<td>Drainage</td>
<td>120.00</td>
<td>20</td>
<td>6.00</td>
</tr>
<tr>
<td>Housing</td>
<td>312.00</td>
<td>15</td>
<td>20.80</td>
</tr>
<tr>
<td>Hospitals</td>
<td>146.90</td>
<td>10</td>
<td>14.70</td>
</tr>
<tr>
<td>Ed. Facilities</td>
<td>55.30</td>
<td>11</td>
<td>5.03</td>
</tr>
<tr>
<td>Prisons</td>
<td>7.90</td>
<td>7</td>
<td>1.13</td>
</tr>
<tr>
<td>Post Offices</td>
<td>7.00</td>
<td>5</td>
<td>1.40</td>
</tr>
<tr>
<td>Locks</td>
<td>17.00</td>
<td>22</td>
<td>0.77</td>
</tr>
<tr>
<td>Ports</td>
<td>4.50</td>
<td>10</td>
<td>0.45</td>
</tr>
<tr>
<td>Waterways</td>
<td>34.00</td>
<td>20</td>
<td>1.70</td>
</tr>
<tr>
<td>Dams/Reservoirs</td>
<td>94.40</td>
<td>10</td>
<td>9.40</td>
</tr>
<tr>
<td>Railroads</td>
<td>36.00</td>
<td>10</td>
<td>3.60</td>
</tr>
<tr>
<td>Mass Transit</td>
<td>31.40</td>
<td>5</td>
<td>6.30</td>
</tr>
<tr>
<td>Highways</td>
<td>1639.00</td>
<td>25</td>
<td>65.50</td>
</tr>
<tr>
<td>Airports</td>
<td>34.00</td>
<td>6</td>
<td>5.70</td>
</tr>
<tr>
<td>Bridges</td>
<td>52.90</td>
<td>20</td>
<td>2.65</td>
</tr>
<tr>
<td>** Totals</td>
<td>3287.70</td>
<td>22**</td>
<td>179.86</td>
</tr>
</tbody>
</table>

** Weighted Average
CHAPTER 3. INTERNATIONAL ALLIANCES

Ever since the end of World War II and up until the mid-1970s unquestioned dominance of the world construction market was an enviable disposition that U.S. engineering and construction (E & C) firms enjoyed. U.S. firms won far more international contracts than competitors from all other countries combined. Of most large contractors operating in the international marketplace, more than half the revenues came from international projects (OTA, 1988).

However, the 1980s ushered in a new era in the world construction scenario - a rapidly declining international market share of U.S. engineering and construction firms. This predicament has been brought about due to a number of related factors, including (Committee For Economic Development, 1984; OTA, 1988):

- Lagging U.S. productivity.
- Rising international competitiveness.
- Deteriorating global economic conditions.
- Falling oil prices.
- Lack of U.S. government subsidies in acquiring international contracts.
- Absence of innovativeness in technology/R&D.
• Limited financial resources of U.S. E&C firms.

Figure 3.1 shows the declining trend of the U.S. construction market. Between 1966 and 1971, U.S. firms captured nearly 70% of the international construction market. Traditionally most U.S. firms have acquired international work from Asia and the Middle East. This market has severely dropped off, although it continues to be of particular importance to the U.S. construction industry. Africa has been the mainstay of European firms, as a result of continuing ties with former colonies (OTA, 1988). A complete revamping of the U.S. outlook to the international construction industry and the infusion of innovative methods to win contracts is urgently required. This chapter aims to enunciate some aspects of international business strategies, as they apply to the construction industry.

The Global Dimension

The vanishing of corporate geographic boundaries and the consequent cross-migration of business globally is a factor that the world has to reckon with. The U.S. is no exception in this environment. Figure 3.2 shows the nature and extent of international influences on domestic business. As a result of this scenario, "global strategic management" is becoming increasingly important.

Definition

Davidson (1982) defines global strategic management as the process of defining, developing and administering a corporate strategy for a world-wide business. This definition stresses global, as opposed to international management, suggesting a comprehensive approach to both domestic and international operations. Strategic,
as opposed to operating management, emphasizes an analysis of the environmental and internal factors that determine the position and profile of the organization in a dynamic environment.

**The multinational contractor**

The multinational contractor is an omnipresent and continuously growing force (Ashley and Bonner, 1987). For a contractor involved in international construction work, the inevitability of risk is an important and significant consideration that has to be effectively dealt with. Most international contractors are cognizant of the situation and usually adopt preemptive measures to overcome and/or cater to uncertainties.

However, with the emerging global dimension and due to the increasing influence of “globalization” in the construction arena, firms hitherto classified as domestic are being forced to deal with some of the issues involved in international construction. This predicament has been catalyzed by the entry and impending entry of foreign firms into the domestic U.S. market, as a result of declining overseas work. Currently, the U.S. construction market constitutes approximately 25% of the world construction market (Building For Tomorrow, 1988).

**The foundations for global strategic management**

Multinational contractors look to foreign markets for two basic reasons (Ashley and Bonner, 1987):

- When opportunities for growth in domestic markets seem bleak.

- To capitalize on expertise and experience gained through specialization in a particular type of construction.
Usually firms involved in international constructions are those that are well entrenched in their respective domestic markets. In the event that a firm decides to internationalize its operations, it must be prepared to deal with foreign competition and chart out specific global strategies. In order to determine the chances of success in a global environment, Davidson (1982) lists certain criteria that form the foundations for a global strategy, as shown in Figure 3.3. An examination of the foundations of global strategy helps determine a preferred course of action as follows (Davidson, 1982):

- Defensive strategy, monitoring for competitive threats in domestic markets and preparing contingency plans for that prospect.

- Reactive strategy, imitating strategies used by other firms before adopting a course of action.

- Proactive strategy, initiating and following a contrived course of action, based on an assessment of the factors mentioned earlier.

Firms pursuing defensive strategies are usually vulnerable in not being able to use foreign cash flows in the event of a recession. Established global firms on the other hand are able to increase their market share by cutting prices, offering favorable terms, providing better services and financial support, if and when necessary.

**Elements of Global Strategy**

Once a decision to enter foreign markets has been made, management is faced with certain critical issues, including (Davidson, 1982):
- Participation Policies.
- Market Selection.
- Marketing Mix Management.
- Sourcing Strategy.
- Financial Policies.
- Organizational Structure.

Key elements in each of the above mentioned factors are listed in Table 3.1.

**Risks In International Investment**

The nature of business in which a multinational contractor operates is traditionally fraught with a multitude of uncertainties requiring constant circumspection and adjustment to the volatile work environment (Ashley and Bonner, 1987). Any lapse in understanding or sensitivity to the environment and its potential dynamics can seriously jeopardize profitability, market share, stability and consequently, preconceived returns on investment. It therefore becomes an imperative for any contractor operating in the international arena to adopt a system of evaluating risks as it applies to international construction. Due to certain inherent characteristics, enunciated later in this text, risks applicable to multinational contractors are unlike those experienced by a typical multinational corporation (MNC).
Risk definition and classification

Risk refers to those potential outcomes of uncertainty that are unfavorable to a given condition or situation. The probability, frequency and severity of the outcome(s) are the prime motives for aversion and need for preemptive action.

In defining risk, as it pertains to the construction industry, the Construction Industry Institute (Management of Project Risk and Uncertainties, October, 1989, p. 2), classifies uncertainties into “knowns”, “known unknowns” and “unknown unknowns”. Currency rate fluctuations represent the “knowns”, the possibility of war in a politically volatile region represents a “known unknown” while the occurrence of natural calamities represent the “unknown unknowns”. In addition to technical or the risk of using new technology, contractual or the possibility of breach and misrepresentation and financial risks, that typically plague the domestic construction industry, the multinational contractor has to confront and deal with political risks.

The Construction Industry Institute postulates certain factors to determine the importance or threat of risk (CII, 1989, p. 3):

- The frequency of occurrence.
- The amount of information available.
- The ability to measure the consequences of loss.
- The potential severity of loss.
- The manageability of the risk.
- The variability of the consequences.
• The potential effects and of publicity in the event of loss.

Despite being based on the above factors, a typical decision making process is often embroiled by intuitive rationalization, with greater aversion for the more catastrophic and less likely natural calamities as against the more recurrent but less serious losses.

**Risk management**

According to CII (1989, p. 4), a typical risk management program would include the following stages:

- Risk Identification.
- Risk Measurement.
- Risk Control.

Figure 3.4 shows a typical “total risk management program” applicable to construction firms (CII, 1989; Boehm, 1965). Risk identification refers to the function of identifying various sources of information and enumerating a “check list” of the factors that could be consequential to a risk management program.

Traditionally, in the construction industry, a contingency allowance to the tune of 5% of the total project cost is made to circumvent the incidence of risk in project estimation. Statistical simulation methods like the Monte Carlo technique may be used to measure risk of the “knowns” and “known unknowns”, while, analytic and discrete event analyses offer mathematical models for risk measurement. An exhaustive description of the various items under the risk management program are covered in the two references cited.

Risk can be controlled in number of ways including (CII, 1989):
• Risk Avoidance: Or dropping out of the competition, when the potential for profitability appears borderline, given the expected rate of return.

• Risk Sharing: Through joint ventures and partnerships or cost per work hour contract.

• Risk Reduction: By reducing the effects of risk through a study of the factors that contribute to its potency.

• Risk Transfer: By transferring certain portions of the contract to subcontractors, who would thus share portions of the risks involved.

• Insurance: Insurance against risk is the traditional method to safeguard against risk, and carries a recurring premium with every project. In the international arena, it becomes increasingly difficult to resort to this form of risk protection, due to the limited numbers of insurance agents willing and able to offer such protection. Often larger companies with sufficient financial leverage are self insured with the insurance costs being added on as “uninsured losses” - a luxury most contractors are unable to afford (CII, 1989; Interviews, 1990).

• Risk Acceptance with or without Contingency: Often, a certain percentage of project costs are added on as contingency funds. However, this liberty may be precluded in the event of stiff competition. Under such circumstances risk reduction or avoidance measures need to be adopted.

These interviews were conducted as a part of the Construction 2000 Competition research project, for the Construction Industry Industry: January to April, 1990.
The multinational contractor in perspective

The multinational contractor has certain unique features different from that of a multinational corporation. Multinational contractors typically provide management and expertise for construction projects in return for a fee (Ashley and Bonner, 1987). Such contractors are characterized by short term involvement and presence in a country, usually on a project-specific basis (Moavenzadeh, 1974). An opportunity for corporate expansion and the possibility of capitalizing on a particular expertise are the main reasons such contractors venture in foreign countries (Ashley and Bonner, 1987; Interviews, 1990). Certain typical characteristics differentiate multinational contractors from multinational corporations. These include Ashley and Bonner, 1987):

- Lack of permanent involvement in direct capital investment. Thus the risks of expropriation and nationalization are precluded.

- Since multinational contracting involves the export of goods and services only, conflicts arising due to a perceived depletion or misuse of natural resources are excluded.

- Multinational contractors usually recover their returns in a much shorter period of time, ranging typically from two to five years.

- Most multinational contracts are project specific in character, without any permanence in terms of paraphernalia such as offices, public relations offices and market.
However, the multinational contractor is exposed to certain political risks that a domestic contractor avoids. These include an extreme sensitivity to environmental factors such as currency regulations, labor restrictions and interim and/or ad hoc host government policies. The inability to insure against such risks makes the multinational contractor highly susceptible to these "microenvironmental risks", that can severely hamper project cash flows, labor, material, overhead costs and revenues (Ashley and Bonner, 1987). With the changing political situation world wide and a performed imperative to go in for long term financial commitments and presence in foreign countries (Build-Own-Transfer and Privatization projects), the multinational contractor is increasingly exposed to the same risks that a multinational corporation faces, in addition to the risks specific to the multinational contractor (Interviews, 1990). To this end, multinational contractors with substantial business overseas need to integrate foreign and domestic operations, establish suitable control over foreign affiliates, understand and adapt to local conditions and develop an international management strategy (Duerr, 1984, Interviews, 1990). A suitable local partner, congenial relations with the host government, local business groups, labor unions and local power groups and an appreciation of local business, culture, ethics and operations, is extremely important to circumvent such risks (Interviews, 1990; Ghadar, 1984). Most firms keep the foreign subsidiary dependent on the home country parent and install an ongoing system of monitoring to control the foreign subsidiary (Ghadar, 1984).

In dealing with foreign governments, certain factors relating to the country are of paramount importance. A country "environment analysis" is usually a prudent course of action. Typically, in any negotiation with foreign countries, certain legal,
social, political and economic conditions need to be analyzed. These are enumerated in Table 3.2 (Davidson, 1982). A characteristic view of a country analysis that could be adopted include an evaluation of national economic performance, economic policies, position in the the international scenario and local politics.

**Build Own Transfer**

Build-own-transfer or BOT refers to a process wherein, private organizations undertake to build and operate a facility that would normally be undertaken by the government. The ownership of the facility is then returned to the government after a fixed concession period (Tiong, 1990). Revenues generated from operating the facility are used to repay the lenders.

This form of financing model was first pioneered in Turkey in 1984 and has since gained currency throughout the world as the most innovative international project financing technique. In a global economic scenario with limited budgetary resources, an urgent need for new infrastructures, a trend towards privatization and a lack of external currencies, BOT pervades as an eminently viable proposal for a community to recover a substantial, unused productivity source (Renault, 1989).

**Procedural aspects**

Figure 3.6 shows a characteristic association tree for a typical BOT project. Contractors, in association with industrial partners, bankers, investors and operators create a multi functional group with varied duties. These include (Renault, 1989; Tiong, 1990):
• The BOT Organization, a concession holding company or sponsor with specific duties that include studies of the market, study, integration of the project into the environment, social and economic effects. This organization also has the responsibility of collecting receipts, maintaining an economic balance, financing legal and taxation problems and provide related communication to the ultimate owner (usually the government).

• The Construction Group: with the responsibility of overseeing production, installation, construction, training programs, operation and maintenance. The construction activity is usually carried out as a fixed cost, turnkey contract.

• The Lending Group: This group deals with all the financial matters pertaining to the BOT project, including evaluating the economic stability of the project, arranging loans, acquiring capital and dealing with the related legal and taxation issues. Repayments are made from project resources.

• The Operator: The function of the operator group is to prepare a joint concession proposal for the infrastructure project under consideration. This includes drawing up and signing the concession contract with the agency authorized to award the contract (usually the government) and then putting the operation into effect. The operator usually bears all the associated operating cost risks.

Typically, a BOT project for new infrastructure develops in four stages:

• Proposal Preparation: This includes preparation, submission and negotiation of a BOT proposal to the awarding party. The ad-hoc association that is created in case of award becomes the concession holder and final arrangements are made for the operation and signature of the concession contract.
• Construction and Start Up:

This involves the actual construction of the project after all the contractual formalities are established.

• Operation and Maintenance:

After the construction is complete, depending on the level of BOT decided upon by the contract, the holding company maintains and operates the facility, charging the users a fee, for repayment of costs. The holding company is completely responsible for the operation of the facility and is responsible for performing financial balances periodically.

• Facility Transfer:

This procedure heralds the ultimate step in the BOT program, where the facility is transferred to the agency awarding the concession. The time period for such a transfer is usually predetermined, based on conditions of the contract.

A thorough economic analysis of the BOT project is extremely important to such projects, entailing a risk investment in the range of 1 to 2% of investment cost. A success rate of 33% or greater is considered reasonable for investment. This includes investigating factors like user price, competition from similar facilities and acceptability of contract conditions for all parties concerned.

Feasibility Conditions For BOT

For a successful BOT project, the simultaneous occurrence of several factors becomes imperative. The involvement of each additional entity introduces the possibility of a host of potential differences that need to be ironed out. This is particularly
complicated with the involvement of international agencies and the consequent currency and trade regulation issues. In general, for a BOT project to be feasible, the following factors need to be considered (Renault, 1989):

- A strong government will to realize the importance and arrange to cater to public facility demand.

- A realistic and achievable economic equilibrium to reach the objectives that may entail provision of government subsidies.

- Technical realism, to incorporate state of the art technology.

- Legal and administrative realism to arrive at a negotiated contract conditions.

- Financial realism, with due consideration being given to the duties of the government, the profit motive of the private enterprises and level of uncertainties involved.

- Limiting competition to a reasonable level, for a fair chance of success.

**Characteristics of BOT projects**

BOT projects have two major characteristics that differentiate them from limited resource projects. These include (Crawford, 1989):

- Government Involvement:

  BOT projects usually entail enhanced roles for government participation. The creation of a concession company, ownership of the fixed asset and control of revenues form the bulk of avenues for government involvement. In addition,
BOT projects aim to diminish in size over time (from the perspective of the contractor), as opposed to a typical company that seeks to expand its operations.

- Risk/Return Relationships:

Risk return characteristics of BOT projects differ considerably from typical construction projects. The main features of the differences are:

- Significantly longer construction periods.
- Longer life of the asset being constructed.
- Low costs of operating and maintaining the constructed facility.
- Usually these projects stand alone, not within a project portfolio.
- Non-availability of funds during construction may increase project costs due to accrued interests.

**Issues in BOT**

**Advantages and disadvantages**

In a situation similar to the privatization process, private sponsorship brings in the following benefits (Renault, 1989, Crawford, 1989):

- Reduces the pressure on state budgetary resources and may even bring in sources of foreign funding.
- Decreases investment costs by 10 to 30% due to increased efficiencies of the private sector.
• Helps transfer and distribute the risks involved in the construction of a facility.

• Introduces competition and commercial management techniques in government operations.

• Helps in the application of new technologies and practices, through a more efficient technology transfer procedure.

• Only the commercially viable (and thereby the urgently needed ones) are undertaken, suggesting reduction or elimination of unnecessary expenditure.

Ingredients for success

BOT projects give rise to significant challenges to both the private sector as well as the government. These include conflicting interests and motives, the possibility of hostility from a competing public utility and exposure to greater risk for the contractor, over a greater period of time. Under such circumstances, the goals of both the government as well as the promoter have to be understood clearly. In this regard, the government should (Crawford, 1989):

• Set clear objectives.

• Select appropriate procedures for award of projects.

• Bestow sufficient decision making authority on the negotiating team(s).

• Have sufficient resources to expedite the process and exhibit a will to champion the project.

• Initiate a BOT program with a small scale project.
The involvement of the promoter is endowed in:

- Arranging sufficient funds from resource consortia.
- Have requisite and appropriate staff to analyze the BOT project.

**Risks in BOT projects**

BOT projects are exposed to three major kinds of commercial risks, including (Beharrell, 1989):

- **Project Commercial Risks:**
  
  These are inherent in the execution of a project and typically include: development risks or the risk of losing the tender to a competitor, realization risks, or the risks involved in failure to complete the project as scheduled and operating risks that result due to variations in costs of operations, material supply and other related operating issues. Lending institutions usually require guarantees against non-completion, delays and cost overruns, before extending a line of credit.

- **Country Commercial Risk:**

  Risks involved in the conversion of project revenues into hard currencies, including foreign exchange and interests, are included in this category of risks.

- **Political Risks:**

  Any BOT project, by nature requires political stability and certainty in its duration and involves the transfer of commercial and economic risk from the public to the private sector. Political risks generally relate to the stability of the
government, the area of operation, the government's policies on repatriation of revenues, fluctuation in regulations and overall integrity of the government.

- Operational Risks:

Risks due to default/insolvency and situations requiring legal recourse are classified under this kind of risk. These risks are perpetrated by underinsured catastrophes, poor project economics and incompetent management. The far reaching effects of such risks, with the potential to affect a large number of the involved parties makes this type of risk a matter of significant concern. The risk of infringement of contractual obligations during the life of the project, with its equally far reaching implications, is another factor that must be considered in any risk analysis procedure.

Typically, the risks involved need to be allocated efficiently to ensure the success of the BOT project. Figure 3.7 shows an influence diagram for risk allocation in BOT projects. Each individual entity will agree to at best take on its share of the risk. Neither the contractor nor the government nor the operator will agree to underwrite the financial risk of the concession company. While the concession company relies on revenue payments for its return on construction costs, the risk for level of attainment of revenues usually rests with the government and consumer. Most of the risks enumerated above can be obviated through certain safeguards, such as completion guarantees, equipment and material warranties, operating guarantees and periodic inspections (Renault, 1989).
Trends in BOT

Although BOT projects represent an innovative and potentially limitless source of both international as well as domestic construction work, the number of such projects seem to be on the decline (ENR, June 29, 1989, p. 38).

However, the incidence of BOT projects are expected to rise, if the new effort initiated by the World Bank in that direction is successful. The World Bank has put together an innovative financing package whereby developing countries would have to cover 30% of their loan requirements for BOT power projects. Such packages are currently being used successfully in a number of developing countries involving a partnership between various leading international construction firms, international financial organizations and host country government. BOT strategies have been introduced in developed countries too, to finance infrastructure reconstruction as an alternative or complement to privatization. The viability of this option was clearly demonstrated in the construction of a 15 mile toll road in Virginia that was completed at less than half the state estimate (ENR, June 22, 1989, p. 15).

Joint Ventures and Partnerships

Joint ventures represent an innovative and increasingly important part of business strategy, given the enhanced imperatives to internationalize corporate operations to remain competitive. Most countries have been endeavoring to introduce the concept of joint ventures into their legal and corporate framework to develop solutions with potential economic and anticompetitive effects (OECD, 1986). Almost all the firms involved in international construction interviewed as a part of this study, were either planning to or are already participating in joint ventures with foreign partners.
(Interviews, 1990). Joint venturing, with project-specific limitations of partnering and termination schedules, were considered to be the most viable means of entering foreign markets. This policy was considered particularly poignant in keeping with the opening up of the potentially limitless Eastern European construction market, as a result of the recent political upheavals. A brief description of the legacies in typical joint venture programs is therefore considered appropriate and pertinent in this text.

**Definition and extent**

Brodley (Joint Ventures and Antitrust Policy, 1982) defines joint ventures as “an integration of operations between two or more separate firms, in which the following conditions are present:

1. The enterprise is under the joint control of the parent firms, which are not under related control.
2. Each parent makes a substantial contribution to the joint enterprise.
3. The enterprise exists as a business entity separate from parents.
4. The joint venture creates significant new enterprise capability in terms of new productive capacity, new technology, a new product or entry into a new market.”

From a competitive stand point, the complex nature of joint ventures places it some where between a contract and a merger, sharing some features of both (OECD, 1986).
According to unofficial reports cited by the Organization for Economic Co-operation and Development (OECD, 1986), joint ventures have been increasing rapidly in most developed countries, primarily in the following areas:

- Research and Development.
- Natural Resource Exploration and Exploitation.
- Engineering, Construction and other Services.
- Product Manufacturing (to enter new markets).

Figure 3.8 shows the four major dimensions of joint venture participation.

**Participation policies**

Certain strategic choices determine the profile of a firm's global strategies. Local partners offer a lot to offer to global firms, including general local knowledge, managerial personnel, market potential and an access to distribution systems (Davidson, 1982). At the same time, there are potential avenues for conflicts, that include policies on pricing, dividends, export, sourcing and royalty. As a result, a formal participation policy is necessary to iron out differences at the inception of the partnership itself.

Participation within core businesses of global firms is unlikely unless the local firm is also equally committed to the business. Global participation increases for products outside the core interests of the global firm. Six major motives for joint ventures are usually cited. A brief complement of each method is shown in Table 3.3.

Financing and finance related issues form an important part of any joint venture program. To this end, most global firms incorporate financing of foreign affiliates
within the capital budgeting structure of the firm's operations. Irregular funding requirements, cost optimization and decisions on liquidity, political risk, tax and repatriation, exchange risk, capital structure and institutional relationships are considered as factors in the capital budgeting process (Davidson, 1982). In most cases, the choice between debt and equity, internal and external sources and local or foreign currency determine the key dimensions of a funding package. Due to the complexities involved in a rigorous analytical procedure, most firms rely on set guidelines and decision rules, with adequate provision for contingencies, to simplify funding decisions.
Figure 3.1: Declining trend of the U.S. construction market (OTA, 1988)
National Control of International Business

- Foreign Policy (including defense)
- Trade Policies
- Monetary Relations
- Foreign Exchange Regulations
- Foreign Investment Controls: Taxation, Antitrust Laws, Immigration Laws
- Sectoral Policies: laws and regulations: agriculture, defense, aerospace, etc.

Government and Economic Systems Abroad

- Formation and Dissolution of Alliances and Blocs
- International Tensions and Rivalries
- Business Trends: Cyclical Changes: Economic growth, Inflation Rates
- Monetary Stability
- Consumption needs and Preferences
- Laws and Regulations

Domestic Business Firms

International Practices of Business

- Export and Import channels
- Foreign Licensing
- Foreign Investments
- Multinational Production and Marketing Organizations
- Joint Ventures
- Turnkey Projects
- Production Sharing Arrangements
- Management Contracts
- Financial and Insurance Syndicates
- International Business Objectives: Strategies and Organization

Figure 3.2: Extent of global influences on domestic business (Kolde. 1982, p. 15)
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation Policies</td>
<td>Preferences for Licensing and Joint Venture Agreements</td>
</tr>
<tr>
<td>Market Selection</td>
<td>Covering the areas of Market Characteristics, Competition, Service Costs and Uncertainty</td>
</tr>
<tr>
<td>Marketing Mix Management</td>
<td>Product, Pricing, Promotion and Distribution Policies</td>
</tr>
<tr>
<td>Sourcing Strategy</td>
<td>Use of imports, choice of technology, source of supplies and decisions regarding management of sourcing: market market or a centralized system perspective.</td>
</tr>
<tr>
<td>Financial Policies</td>
<td>Formulation of effective structures, methodologies and decision rules to deal with international financial transactions and functions. Capital budgeting, funding, cash management, intracompany transactions, repatriation, exposure management, tax and financial reporting are the main areas of activity.</td>
</tr>
<tr>
<td>Organizational Structures</td>
<td>Deals with the choice of management method to be adopted in organizing the global enterprise: area, matrix or mixed.</td>
</tr>
</tbody>
</table>

Figure 3.3: Criteria for global strategies (Davidson, 1982)
Figure 3.1: A typical total risk management program (Ashley and Bonner, 1987).

(total risk management)

- Control
  - Containment
    - Contingency Planning
      - Training Programs
  - Pre-planning
    - Avoidance
    - Sharing
    - Reduction
    - Insurance
    - Acceptance With Contingency
    - Acceptance Without Contingency

(total risk management)

- Measurement
  - Traditional
    - Simulation
    - Analytic
    - Discrete Event

(total risk management)

- Identification
  - Sources
    - Site Visits
    - Foreign Offices
    - Public Relations
    - Finance Contacts
    - Government Sources
    - Industrial Contacts
    - International Banks
    - Private Organizations
    - International Agencies

(total risk management)
Figure 3.5: Factors in the capital budgeting process (Davidson, 1982)
Figure 3.6: Association tree for a typical BOT project (Renault, 1989)
Figure 3.7: Influence diagram for risk allocation in BOT projects (Renault, 1989)
### DIMENSION

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>Ownership</th>
<th>Managerial</th>
<th>Marketing</th>
<th>Manufacturing</th>
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<td>Wholly Owned</td>
<td>Complete Responsibility by Parent</td>
<td>Internal Staff and sales Force</td>
<td>Full Production</td>
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<tr>
<td></td>
<td>Majority</td>
<td>Strategic Operating Financial</td>
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<td></td>
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<tr>
<td></td>
<td>Co-owned</td>
<td>Specialized Limited Responsibility by Parent</td>
<td>Distributors</td>
<td>Component Production</td>
</tr>
<tr>
<td>LOW</td>
<td>Minority Licensee</td>
<td>Passive Parent Role</td>
<td>Agents Brokers</td>
<td>Assembly</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Import From Parent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Indigenous Procurement</td>
</tr>
</tbody>
</table>

Figure 3.8: Four major dimensions of a typical joint venture (Davidson, 1982)
Table 3.1: Key elements of a global strategy (Kolde, 1982)

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<tr>
<th>Legal Conditions</th>
<th>Social Conditions</th>
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<tbody>
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<td>Property Rights</td>
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<td>Patent and Copyright</td>
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<td>Literacy</td>
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<td>Foreign Investment Restrictions</td>
<td>Predominant Religion</td>
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<td>Court System</td>
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<tr>
<td>Commercial Codes</td>
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</table>

<table>
<thead>
<tr>
<th>Political Conditions</th>
<th>Economic Conditions</th>
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<tbody>
<tr>
<td>Type of Government</td>
<td>Rate of Growth</td>
</tr>
<tr>
<td>Age of System</td>
<td>Manufacturing/GNP</td>
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<tr>
<td>Number of Political Parties</td>
<td>Inflation</td>
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<tr>
<td>International Relations</td>
<td>Unemployment</td>
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<tr>
<td>Nature of Internal Opposition</td>
<td>Balance of Payments</td>
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<tr>
<td>Industrial Policy</td>
<td>Industry Structure</td>
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<td>Trade Policy</td>
<td>Disposable Income</td>
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<td>Monetary and Fiscal Policy</td>
<td></td>
</tr>
<tr>
<td>Government Role in the Economy</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.2: Factors in foreign government negotiations (Davidson, 1982)

<table>
<thead>
<tr>
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<th>Politics</th>
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<td>Demographics</td>
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<td>Social Objectives</td>
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<td></td>
<td>Social</td>
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</table>
Table 3.3: Major motives for joint ventures (OECD, 1986)

<table>
<thead>
<tr>
<th>Motive</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complementary Technology</td>
<td>Research and development joint ventures. Usually, firms from different industries or different segments of the same industry are involved. Important vehicle for technology transfer.</td>
</tr>
<tr>
<td>Raise Capital</td>
<td>Firms unable to raise enough capital to take on a large project on its own, may get into joint ventures, to raise capital and repay loans. Resource exploration and development ventures.</td>
</tr>
<tr>
<td>Risk Sharing</td>
<td>Applies particularly to smaller firms, depending on the levels of risk and capital expenditures involved. Resource exploration, R &amp; D and large construction and engineering projects are types of joint ventures where even large firms cooperate to reduce risks.</td>
</tr>
<tr>
<td>Economies of Scale</td>
<td>Used in industries where economies of scale a joint venture, particularly a vertical joint venture may produce substantial distributional and transactional savings. Part or limited integration may be preferred, with the option of foreclosure, in the event of potential areas of disagreement.</td>
</tr>
<tr>
<td>Market Penetration</td>
<td>To overcome entry into highly concentrated or protected markets, firms may associate with domestic firms to circumvent entry barriers.</td>
</tr>
<tr>
<td>Market Power</td>
<td>To increase market share or to avoid competition, both actual and potential, from a buyers or a sellers side of the market. This issue is a subject of a major legal concern.</td>
</tr>
</tbody>
</table>
CHAPTER 4. RESEARCH METHODOLOGY

Introduction

This study was conducted by a research team at Iowa State University in Ames, Iowa, under the guidance of the Construction Industry Institute's Construction 2000 Competition Task Force sub-committee. The findings of the study include data collected from a wide spectrum of firms that are affected either directly or indirectly by the construction industry. The results are expected to be useful to a wide audience, to those that provide construction services, as well as to those that are clients of the industry. The information pertaining to this study was collected in five phases as follows:

- Phase 1: Literature Review.
- Phase 2: Development of the Interview Guide.
- Phase 4: The Interview Process.
- Phase 5: Compilation of Data.

The first phase began in September 1989, with a review of literature and preliminary development of the interview guide. The scope and methodology of each of
the phases is detailed below:

**Phase 1: Literature Review**

Due to the nature and extent of the study, the literature search was identified as a critical component in this research project. This included reviewing of pertinent literature under three broad headings, as follows:

- **Competition**: covering the areas of competitive forces, corporate capabilities, entry of foreign firms, mergers and acquisitions, U.S. market share in international construction and trends in the sectors and regions of possible expansion.

- **Privatization and Build-Own-Transfer**: covering the areas of project financing, the nature and state of the economy and its implications on the construction industry, procedures for risk evaluations and concerns in international construction competition.

- **Management, Organization and Structure**: covering approaches and techniques for corporate and personnel preparedness, to operate in the global dimension.

Under each of the above classifications, historical trends, theoretical concepts and future trends were determined. In particular the peculiarities of certain eras and the resulting relevance in shaping the construction industry during those eras were considered important in the study.

**Phase 2: Development of the Interview Guide**

After a major portion of the literature review was complete, a preliminary design of the interview guide was undertaken. This involved development of a series of
questions under each of the sub-headings, as indicated in phase 1 above. Draft copies of the interview guide were sent to each member of the task force, for comments and corrections. After four iterations, and a plenary meeting of the task force members in Birmingham, AL, three separate interview guides were developed, one each for:

- Contractors, engineers and developers.
- Government agencies.
- Owner firms.

While the number and contents of the questions for each of the three editions of the interview guides were identical, the questions were categorized as being of primary or secondary importance, depending on the type of firm. The sequencing of the questions was slightly different in each edition of the interview guide. While the same interview guide was used for contractors, engineers and developers, the interview guides for the government agencies and the owners were slightly different.

The interview guide was split up into three parts, as follows:

- **Section 1:**
  Contained questions that were pertinent to the company in general, including size, location, extent of operations and personal data of the people interviewed. These data were considered necessary to compare and contrast trends among and within firms in different sectors.

- **Section 2:**
  Section 2 was split up into parts (a) and (b) and contained certain designated scenario questions dealing with certain designated scenarios about the economy.
Sections 1 and 2 were identical for all the editions of the interview guide. This section was included to solicit "gut-feelings" about the nature of the present and future state of the economy and its implications on the construction industry thereof.

- Section 3:

Section 3 contained certain structured questions, relevant to the three major divisional classifications. A total of around fifty questions, were enumerated, and approximately equally divided among the three divisions. However, due to anticipated time constraints, a compilation of around fifteen questions from the list were prioritized separately for owner, contractor, engineering, developer and government agencies, based on suggestions from the task force members. Time permitting, the additional questions in Section 3 (b) were discussed. The nature of the questions in this section were directed to implore strategies that firms are currently adopting and would consider adopting, to remain competitive in the future.

**Phase 3: Development of the Interview Guide Matrix**

Once the interview guide was developed, a number of sectors were identified and certain companies within those sectors were targeted as potential interview candidates. The factors considered in choosing prospective firms were as follows:

- A balanced mix of firms in various sectors, including commercial buildings, institutional buildings, industrial buildings, infrastructure construction, light industrial construction, heavy industrial construction, process, power and space.
• A mix of firms classified as contractors, engineers, government agencies, owners and developers, within the sectors enumerated above.

• Geographical diversification, within the U.S., covering the midwest, the southeast, the northwest, the West Coast, the Washington D.C. area, the northeast and Texas.

• Limitations of the travel budget.

Phase 4: The Interview Process

A total of six interview trips were made, covering an average of six firms in each trip. This included 12 owners, 10 contractors, 7 engineering firms, 5 government agencies and one developer, for a total of 35 firms. The interviews were set up with the help of the members of the task force and was conducted over a four-month period starting January, 1990. Preliminary calls were made to the prospective interviewee firms, explaining the contents and nature of the research project. Depending on the response received, an interview was scheduled and a copy of the relevant interview guide was sent approximately two weeks prior to the scheduled interview. During the interview, Section 1, requesting certain pertinent details of the firm and the individual(s) being interviewed was collected. The rest of the interview, covering Sections 2(a), 2(b), 3(a) and possibly 3(b) was taped, with the permission of the interviewee for future analysis. In some cases, follow-up calls had to be made to expedite the return of Section 1 of the interview guide, if it was not collected during the interview. A complete listing of the firms interviewed is shown in Table 4.1. The actual names and addresses of the firms have not been revealed, due to CII directives.
regarding the level of confidentiality to be maintained. Copies of the three interview
guides are enclosed in the appendices. During each of the interviews, a conscious
effort was made, to encourage the “blue sky” approach, and the interviewees were
asked to be as prescient as possible. No attempt was made to steer the interviews
in any particular direction. This approach was adopted to solicit intuitive opinions
from the interviewees - a factor that was considered to be inherently pertinent to the
blue sky approach.

Phase 5: Data Compilation

After all the interviews were conducted, the data were analyzed using dBASE
IV. Four different database structures were created, one each for the three editions
of the interview guide and one for the personal and general company information. Data
obtained from the interviews were incorporated almost verbatim in “memo” fields,
within the database structure. After entering all the data in the memo fields, certain
repetitious key words were identified and the data were sorted on the basis of the
key words, with the option of including important and interesting quotes, wherever
applicable. However, due to limitation of the sample size and in keeping with the
“blue sky” approach to the project, rigorous statistical analyses were considered un-
necessary and as such, avoided. Trend analyses were then performed on the compiled
data.
### Table 4.1: The interview trip matrix

<table>
<thead>
<tr>
<th>NO</th>
<th>CODE</th>
<th>LOCATION</th>
<th>TYPE</th>
<th>SECTOR</th>
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<td>O</td>
<td>SP</td>
<td>Apr 19, 1990</td>
<td>6</td>
</tr>
</tbody>
</table>

**TYPE:**
- E: Engineering
- C: Contractor
- O: Owner
- G: Government
- M: Miscellaneous

**SECTOR:**
- BC: Buildings, Commercial
- BI: Buildings, Institutional
- BN: Buildings, Industrial
- IN: Infrastructure
- IH: Industrial, Heavy
- IL: Industrial, Light
- MI: Miscellaneous
- PW: Power
- SP: Aerospace

**Code Used:** Type, Sector, Trip, Order of Interview
CHAPTER 5. RESULTS AND DISCUSSION

The scope of study incorporated within this thesis is an abridged version of the study conducted for the Construction Industry Institute’s Construction 2000 task force. The aim of the study was to identify certain “driving forces” that are likely to influence the functioning of the construction industry over the next decade and beyond. The study was primarily divided into three sections, covering the broad areas of competition, finance and management. The financial and related aspects and their connotations thereof, on the construction industry is the major thrust of the portion included within this thesis.

Fourteen questions from the Construction Industry Institute’s Study were targeted as key questions to determine likely trends within the construction industry that are likely to be affected by fiscal policies. A listing of the fourteen questions used is shown in Appendix A. Responses to these questions were obtained from each of the thirty five firms interviewed in the study, that included 18 engineering/construction firms, 12 owner firms and 5 government agencies. These firms were selected, based on industry-wide, geographical and size classifications, to get a fair mix of the across and within industries. Results and observations of the various people interviewed are presented. This includes reflections encountered and trend analyses, based on these reflections.
Disclaimer

The material presented in this chapter reflects the views and opinions of the interviewees interviewed as a part of the research project. Due to budgetary and time constraints, the scope of the interviews had to be kept within feasible limits. As such these views do not necessarily represent the entire cross section of the industry, or those that are directly affected by it. However, the trends discovered and presented are accurate reflections of the views of the interviewees. It was not the purpose of the research project to carry out extensive statistical analyses of data, since the “blue sky” approach was one of the prime objectives. The results presented are intended to be a medium of exchange of the thoughts, aspirations, opinions and ideas within the construction industry and without, in so far as it is affected by the externalities in question - such as the clients of the construction industry and its regulators.

Future of the Economy

Almost 90% of the respondents were optimistic about the future of the economy and predicted an increase or at least a continuation of the present trend, namely slow but steady growth. Exponential growth rates were predicted for certain areas of the world, including Asia, the newly industrialized countries and Eastern Europe. Domestic U.S. economy is expected to experience a flat growth rate and be largely guided by the situational demands. However, exploitation of the global market is expected to have a positive and invigorating effect on the U.S. economy in general and the construction industry in particular. However, this would involve radical changes in the way the construction industry functions at present, with greater emphasis on
adjustment and adaptation to the international market conditions and competition. The only negative effects of the predicted scenario is the anticipated shortage of workers, which would mean higher salaries and competitive retention programs, thus increasing overall operation costs. Figure 5.1 shows the results of the response to the question on the expected condition of the economy.

Major Changes

The possibility and need for change within the construction industry was an unanimous observation. Certain definitive changes affecting the industry were identified. These primarily related to increasing competition in the international marketplace and the need for U.S. firms to adjust to the changing times. Primary factors identified as common among the three types of firms included:

- A need to understand and appreciate the ethics and cultures of other countries, discarding the "American Way".

- Expecting and adjusting to differing levels of education and training.

The need for a clear understanding and appreciation of the political dynamics of the host country, before entering into any business ventures.

Adjusting and/or developing alternate avenues of having a constant source of labor and material supply. Material supplies were identified as being particularly susceptible to minor provocations in the geo-political situation. Figure 5.2 shows the trends observed for each of the above issues. In addition to the above concerns, most engineering, contractor and owner firms identified increasing incidences of partnerships, joint ventures and internationalization as the other major factors likely to
affect the industry. Diversification of markets, both functional and geographic were considered vital, with particular attention on environmental issues, infrastructure and Eastern Europe. The government agencies identified defense cutbacks, increasing private investment in infrastructure, a severe shortage of labor and a reduction in federal funding as the major changes likely to affect the construction industry.

**An Energy Crisis**

Close to 85% of the respondents feared that there was a possibility of another energy crisis. However, the likely effects and response of such an energy or oil crisis was found to be clearly different between engineering/contractor firms and owner/government firms. Most construction and engineering firms looked upon an energy crisis as a potential source of work, in exploration, development of plants and facilities for alternative energy sources. A contrived rather than an actual oil crisis was an apprehension expressed by some owner firms and government agencies. The detrimental effects identified by the owner firms and government agencies included impacts on production, rising costs, lower profits, research funding and a general tendency to retard economic growth. The results of this section are presented in Figure 5.3.

**The Emergence of Global Centers**

A mixed response was observed in pinpointing predicted global centers of power. While half the respondents predicted a continued domination of the three centers, namely Japan, the U.S. and the European Community, a fairly significant trend towards a global homogenization of power was also evident. The opening up of
the Eastern block countries, the rapidly developing Pacific rim, a united Germany and the emergence of the "newly industrialized countries" were believed to be likely contributors to the phenomenon of global power equilibrium. Figure 5.4 shows the statistics relevant to these data.

**U.S Technological Strength**

Less than 10% of the respondents expressed optimism regarding the possibility of the U.S. maintaining its technical edge in the international marketplace. Eighty percent of the respondents felt that the U.S. advantage will either erode or stagnate to a point where it will be caught up by other countries, thus losing an important "selling point". Another characteristic of this technological decay is the fact that the U.S. still leads in overall quantum of innovative technologies, but is being overtaken by countries that specialize only in particular fields. Most firms identified Japan, automation technology and a shortage of labor as being the factors in this issue. The predicted trends in U.S. technological advantage are shown in Figure 5.5

**Shortage of Workers**

The impending shortage of workers was a striking unanimous prediction of all the respondents. A number of possible solutions were forwarded to circumvent the predicted labor shortage, including:

Improving and enhancing the prestige associated with the industry, in order to attract more people to the profession. A common and genuine complaint of the contractors was that the industry was not glamorous enough to induce parents to seek a career as a construction professional for their children. An urgent need to
promote the industry very positively was expressed.

Widespread recruitment of women, minorities and even qualified foreigners was propounded as a possible measure against the predicted labor shortage. Round the clock design activity, involving engineers from all over the world, through electronic communication systems was another alternative put forward, with the caveat that this option carried the danger a potential decline in U.S. standards of living.

Innovative employee attraction and retention packages was an alternative being seriously considered by almost all owner and contractor/engineer firms. These included special considerations for women employees, dual income families, daycare and elderly care facilities.

Automation and adoption of innovative technologies were identified as the two most effective and viable means of overcoming the predicted labor shortage. Hiring of recent college graduates, as opposed to limiting the hiring process to experienced individuals and constant re-training programs in house were considered two important and related issues with a direct bearing on the labor situation. Contracting out work to specialist consultants as opposed to hiring more people in the competitive job market appeared to be the choice of most government agencies in overcoming the predicted labor shortage. Details of the responses to the predicted labor shortage are shown in Figure 5.6.

**Government Regulations and Control**

Almost all the respondents predicted an increase in the levels of government regulations likely to affect the construction industry. The likely areas of increased regulations were in worker safety and environment related issues. The environment
was identified as a definite area of increased government control and regulation. While the government agencies interviewed expressed an inability to reduce regulations, in view of an enhanced concern for the environment, streamlining the regulatory process was a factor they were willing to consider. The reactions of the owner and contractor/engineer firms was markedly dissimilar with regards to the effects of increased regulations.

An increase in business was an unanimous opinion of all the contractors interviewed. Contractors viewed increased government regulations as an important windfall in terms of new and continuing work. However, increased monitoring in the Occupational Safety and Health Act (OSHA) regulations was considered to be a likely hindrance to productivity. This factor was identified as a possible reason to promote internationalization of company interests, in areas where the laws are less rigorous.

Most owner firms regarded increasing government regulations as a significant factor likely to impede performance and productivity, leading to a loss in U.S. competitive advantage. At the same time, increased regulations were also looked upon as being beneficial in the long run, when familiarity and compliance with stringent U.S. regulations would make it easier to enter foreign markets, where the regulations are likely to increase. Figure 5.7 shows details of the predictions on government regulations.

Global Political Stability

A mixed reaction was observed in relation to global political stability. While nearly half the interviewees felt that the geo-political situation is likely to stabilize
and tend towards congeniality, an equal number of respondents found it a situation as difficult to predict or irrelevant to U.S. commercial interests. A majority of the contractors predicted an increase in global political stability, basing their decisions on the recent culmination of the “cold war” and the possibility of the European market opening up to hitherto unprecedented levels. Other contractors, operating primarily in the domestic market, found global political stability irrelevant to their business interests, claiming that even in the event of enforced internationalization of their operations, entry into unstable markets was a foregone preclusion.

Most owner firms viewed an effort towards global cooperation as an imperative in the international corporate arena, to foster partnerships and expand into global markets. The development and upliftment of South America was considered an important element in this process, since it offered the best potential market for U.S. goods, from a geographical standpoint. Military cutbacks by U.S. and other countries is predicted to have a direct bearing on the domestic construction industry, due to re-routing of defense funds in infrastructure development. The variations on the issue of global political stability are shown in Figure 5.8.

**Key Factors to Remain Competitive**

Flexibility, nimbleness, diversity and technology were cited most often as “key factors”, to remain competitive. The following factors were identified as being most likely to influence construction industry competition:

Flexibility of operations and the ability to adjust to changing client needs rapidly.

Diversification and expansion of markets, both in terms of service and geographical extent, by developing niche areas of expertise in different fields, determined by
Recognizing the importance and need for congenial people relationships, including both clients as well as employees. Management of human resources was considered top priority by almost all interviewees.

The formation of strategic alliances to further business interests. In the international construction arena, U.S. firms are seriously considering using the financial leverage and government support of foreign firms, to complement their construction management expertise, to win contracts.

Innovation and the capacity to adapt new technologies, to stay abreast of the competition. These include, in particular, extensive use of computers and a trend towards automation within the industry.

The delivery of quality products and service, with improved productivity, better management planning, pushing the decision making process down and standardization of the myriad functions of a typical construction operations, while keeping costs down.

Maintaining a strong financial disposition in order to have the ability to take risks, venture into new markets and tide over periods of recession. Figure 5.9 shows a distribution of the factors considered most likely to influence future competitiveness in the construction industry.

**Loss of U.S. Competitive Advantage**

Five major possible causes leading to a loss in U.S. competitive advantage were identified. These include:

Inability to maintain levels of education and technological advantage. A decrease
in productivity, fueled by the world's highest standard of living. Neglect of personnel
issues affecting clients as well as employees. Undue and inappropriate interference
by government agencies. An erosion of managerial and financial strengths.

The newly industrialized countries, Japan and Europe, were seen as potential
threats likely to catalyze loss of U.S. competitive advantage. The predicted labor
shortage, increase in government regulations, U.S. tax and anti-bribery laws and the
lack of governmental support in obtaining international projects were among the
reasons cited as being factors with a direct negative bearing on U.S. competitiveness.
Figure 5.10 shows the distribution of the observations encountered.

Financial Issues in Construction

Financial aspects within the construction industry were considered to have a
strong bearing on future competitiveness. In particular, certain issues critical to
project financing were determined, as follows:

Both owners as well as contractor firms felt that venturing into new and possi-
ibly risky endeavors was an inherent characteristic of the industry. These included
adoption of innovative methods of project financing, like privatization and build-own-
transfer, to obtain projects. Provision or the arrangement of finance for owners was
considered to be an increasingly important part in winning construction contracts in
the international market place. "Financial engineering" or the management and ma-
nipulation of financial leverage to acquire projects is a phenomenon rapidly gaining
currency in the international arena.

Lump sum, negotiated contracts and an increasing incidence of long-term part-
nerships between owners and engineering/construction firms appear to be the trend
of future construction contracts.

Almost all the government agencies were in favor of greater equity participation on the part of the contractor in financing a project. This was considered particularly significant in furthering the drive towards privatization, especially in the critical areas of infrastructure reconstruction, environmental clean-up, prisons and roads. The limitless opportunities presented by the privatization option, in light of the increasing trade and federal deficits seems to be an area that contractors should consider seriously, in spite of the limited precedents to the option present in the U.S. today.

Some owners maintain that competitive pricing would continue to be the norm in granting future contracts. However, it is likely that this will change in the future with increasing popularity of the "strategic partnering" concept being promoted by the contractors. Industry trends relative to project financing are presented in Figure 5.11.

The Role of Trade Unions

A majority of the owners as well as contractors were of the opinion that the role of the trade unions was definitely on the decline. Almost 60% of the contractors and 75% of the owners expressed satisfaction at the potentially declining role of the unions. The government agencies were not asked this question. The unions are expected to play the role of a "social organization" rather than be involved in the day to day management of the company. Figure 5.12 shows the distribution of the opinion regarding trade unions.
Facing the Labor Situation

Given the predicted shortage of labor, five different courses of action were proposed, in order to contain the deteriorating labor situation. These included:

- Provision of attractive incentive and benefits packages over an above the normal paycheck. In particular, these included provision for daycare centers, assistance in locating jobs for both spouses, for dual income families and even subsidizing day care charges for elderly dependents.

- Hiring of fresh college graduates and training them on the job, as opposed to the erstwhile policy of hiring only ‘experienced hands’ was another potentially viable option being considered. This was in fact considered to be an inevitable option, in view of the already existing shortages.

- Most government agencies were in favor of hiring consultants on a project specific basis, due to their apparent inability to compete against the industry, in the recruiting process.

- Automation and the introduction of new technology was considered the final option in facing up to the labor situation. Ironically enough however, in spite of the unequivocal opinion regarding an apprehension to remain competitive through technology, a very small percentage of the firms were even considering the option of automation as a possible solution.

Figure 5.13 shows the distribution of the alternatives being considered for employee retention. Certain recommendations and conclusions based on the above results are presented in the following chapter.
Percentage Response

Predicted State of the Economy

Number of Responses

Contractor/Engineer  Owner  Government

Increase  Continuation  Decline  Other  No Response

Figure 5.1: Predicted state of the economy
Major Concerns in
International Construction

Figure 5.2: Major concerns in international construction
Possibility of an Energy Crisis

Figure 5.3: Chances of an energy crisis
Predicted Global Centers

Figure 1.4: The emergence of global centers
U.S. Technological Strength

Figure 5.5: Trends in U.S. technological advantage
Shortage of Workers

Figure 5.6: Predicted labor situation
Government Regulations

Figure 5.7: Views on government regulation and control
Percentage Response

Global Political Situation

Figure 5.8: Global political stability
Key Factors to Remain Competitive

Figure 5.9: Factors likely to influence competitiveness
Factors Contributing To The Loss Of U.S. Competitive Advantage

Figure 5.10: Factors leading to the loss of U.S. competitive advantage
Financial Issues in Construction

Figure 5.11: Industrial trends and project financing
The Role of Trade Unions

Figure 5.12: The anticipated role of trade unions
Facing the Future Labor Situation

Figure 5.13: Facing the future labor situation
CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

The next decade will be a trying time for the U.S. construction industry in terms of maintaining its reputation of being the dominant force in the international construction arena. It is more than likely at this stage that the U.S. construction industry will be equalled or even overtaken by firms from other countries unless drastic measures are adopted to reverse this course of descent.

A number of unprecedented measures need to be adopted in reversing this trend. Firstly, a realization that the “American Way” is not necessarily the best way or for that matter, the only way to perform construction services. The imperative to combine and synergize the efforts and endeavors of all the ‘players’ in the construction industry, i.e., the owners, the government agencies and the engineering/contractor firms is clearly evident, if the U.S. is to maintain its dominance in the world construction market place. This may even involve cooperation and strategic partnering between entities hitherto considered corporate adversaries. The degree to which this cooperation is achieved, to circumvent the problems of decreasing labor supply, falling educational standards, decreasing productivity and loss of the all important technological edge will determine the success of the industry in the year 2000.

The good news relative to this situation is that there is a realization of the decline of U.S. competitive advantage and steps are being taken to retard the detri-
mental steps. The need to improve the state of the infrastructure, the trend towards formation of strategic alliances and partnerships, greater involvement by the government, an effort to stimulate innovation and a recognition of client and employee needs appear to be steps in the right direction. However, these steps must be catalyzed and adopted across-the-board by all members of the construction community, if any significant changes are to be gained.

Recommendaions for Further Study

It was not the intent of this study to determine of all the variables associated with competition in the construction industry at the beginning of the twenty first century. The interviews were aimed at identifying issues that are likely to affect the nature of construction industry competition, based on the extensive experience of the interviewees. Clearly, the study is not conclusive in any definitive manner, although it does shed light on certain driving forces of the future. A number of potential research areas exist that can be pursued to have a better insight into the future of the construction industry. These include:

- Analysis of trends between firms in different sectors, to determine individual driving forces affecting those sectors. Analysis of trends between firms of differing sizes.

- The study could be extended to include the opinions and reflections of firms in foreign countries, particularly those identified as potentially "most likely to succeed".
The study could be made much more extensive in terms of number of companies interviewed, to have sufficient data for statistical analyses.

Epilogue

Any prediction, no matter how well calculated, has a certain degree of probability associated with it. This study was undertaken with the objective of providing potential trends likely to influence the construction industry in the future. To the extent intended, this task was mostly achieved. However, the inherent shortcoming of any 'prediction' lies in its probability of default. This situation is probably best exemplified by the recent unprecedented geo-political upheavals that rocked the world, namely, the conclusion of the cold war, opening up of the European market and across-the-board defense cuts. The emergence of the so-called 'newly industrialized countries' is another potential source of possible global political upheavals. It is probably likely that the world will witness increasing cooperation and globalization - a situation that indeed must be welcomed by all parties concerned, for greater good.


U.K. (June, 1989).


Ramanadham, V. V. “Privatization: The UK Experience and Developing Countries.” *Privatization in Developing Countries.* V. V. Ramanadham, Ed. Billings & Sons Ltd., Worcester, Great Britain (1989).


APPENDIX A. CONTRACTOR INTERVIEW GUIDE
January 30, 1990

Mr. John Doe
Vice President Marketing
XYZ Construction Company
P.O. Box 123
Anytown, IA

Dear John:

Your help is solicited in exploring strategies and identifying certain 'driving forces' that are likely to impact future competitiveness in the U.S. construction industry. This research project, funded by the Construction Industry Institute (CII) Construction 2000 Task Force, is being conducted at Iowa State University. The scope of this study is expected to cover a wide variety of companies, including construction management firms, engineering firms, architecture firms, contractors, owners, developers and government organizations. The study will include three general categories, covering both international and domestic views on:

- Shaping of Corporate Capabilities,
- Financial, Political and Legal Considerations,
- Management, Organization and Structure.

Pertinent information obtained from industrial sources and literature reviews will be used to identify potential strategies that will allow U.S. firms to remain competitive in both domestic and international markets. The results of this research project will be available from CII, after its completion in 1991. The information generated from this project will be not only be useful to members of the construction industry, but also to members of other business sectors, to help them plan corporate strategies for the next decade and beyond.

Your firm has been identified as a leader in its field, and a potential contributor to this research project. We seek to interview key person(s) in your organization who would be able to provide us with predictions and/or opinions on the above mentioned issues. The opinions, predictions and expectations will also be used by two graduate students in Construction Engineering and Management, as a part of their final thesis requirements for the master’s degree. All the information obtained, will be kept strictly confidential. The interview will be tape recorded, and a typed copy of the interview transcript will be sent to you for your approval, prior to its incorporation in the final report.

Enclosed please find a summary of the research intent, a copy of the interview guide and a copy of the confidentiality statement, that outlines the level of confidentiality that will be maintained (Appendix A). As discussed earlier, a graduate student at Iowa State University, Mr. Steven D. Njos will be visiting with your firm for the interview on January 31, 1990, at your office
in Anytown, IA. In case you have any questions or need further clarification on any matter, please call either Mr. Steven Njos or Mr. Subhransu Mukherjee, at (515)-294-3916.

The members of the research team involved with this study would like to thank you in advance for your time and cooperation.

Sincerely,

Dr. J.K. Yates
Assistant Professor
Construction Engineering
Department of Civil and
Construction Engineering

JKY/sm
enc: As above.
Anatomy of the Construction Industry: "Competition in the Year 2000" Interview Guide

Iowa State University
Principal Investigator:
Dr. Janet K. Yates
Research Assistants:
Steven D. Njos
Subhransu Mukherjee
FOREWORD

General Information:

This interview guide is being sent to you prior to your scheduled interview, in order that you may familiarize yourself with the questions that will be discussed during the interview. When reviewing the interview guide please take note of the following particulars:

* The confidentiality statement and data confidentiality guidelines are attached in Appendix A. As indicated, this project was classified as being of 'Level 2' or medium confidentiality. Certain particulars of your company may be required, primarily to identify and analyze trends between firms of different sizes and sectors. However you or your firm will not be specifically identified in the report.

* The interview guide is divided into three sections as follows:
  Section 1: General Company Information
  Section 2: Scenario Questions
  Section 3: Structured Questions

* We request that you complete the first section (General Company Information) prior to the interview, as it will be collected at the interview.

* We do not expect complete written answers to sections 2 and 3. The spaces provided are only to facilitate taking notes prior to the interview.

* It is our sincere request that you familiarize yourself with the interview guide before the interview in order to make the best use of your time.

Particulars of Individual Sections:

The following descriptions may be helpful in understanding the questions detailed in each of the three sections:

**Section 1: General Company Information**

The information requested in this section will be used solely to compare and contrast trends between firms of differing sizes, sectors and function, without stating actual names or figures. However, we realize that some information could be withheld due to company policy restrictions.

**Section 2: Scenario Questions:**

Scenario questions are aimed at predicting the state of affairs in 10 to 15 years. The questions may appear to have a strong bias towards construction firms. However, we urge owner organizations, engineering firms and other construction related firms to express their perspectives on the construction scenarios and their expectations of construction firms in the future.

**Section 3: Structured Questions:**

This section is composed of three subsections, namely:

a. Competition
b. Financial, Political and Legal Considerations,
c. Management, Organization and Structure.

Once again, the questions may appear to be biased towards construction firms. However, we urge firms that are not directly performing construction i.e. owners, developers, government agencies etc., to express their points of view, in order to help us identify differences and compare trends.
Research Intent

The U.S. construction industry is facing increasingly intense global competition. If U.S. firms are to remain competitive, it is crucial that their managers be cognizant of the strategies that are likely to have the greatest impact on competitiveness in the immediate and distant future.

Through this research effort, we intend to generate information on the nature, driving forces and structure of competition in the year 2000. This research effort will investigate the predicament that U.S. firms are faced with, given the increasing levels of global competition. The investigation will seek to provide U.S. firms with a prediction of the nature of the competitive environment in the future.

Insights into the future state of global competitiveness will be speculated by developing alternative scenarios for the state of competition in the construction industry in the year 2000. Comparisons between existing and predicted trends will be analyzed to relate the present state of global competitiveness to the driving forces that are likely to reshape the construction industry in the global as well as domestic arenas.

A specific research objective is to study the major areas that will affect competition in the future including, but not limited to:

* The shaping of corporate capabilities: vertical integration, and horizontal expansion, to increase corporate capabilities and market share, including foreign acquisition and mergers by U.S. firms and foreign firms.

* Financial considerations, including innovative methods of financing projects, analysis and evaluation of the risks and incentives involved in foreign and domestic investments.

* Management, organization and structure: approaches and techniques to prepare people to operate in a global environment.

The scope of this research project includes primarily the non-residential construction industry encompassing, infrastructure, process, power, space, industrial and the non-residential building construction sectors. The involvement, perspectives and expectations of owners, government organizations, engineering/design firms and developers are considered to be of paramount importance, in their capacity as potential clients of the U.S. construction industry in the year 2000 and beyond.
SECTION 1: General Company Information
(Please supply written answers to the questions in Section 1 only.)

Company Name: ___________________________________________________________

Address: _________________________________________________________________

City: ___________________________ State: _________________________________

Zip: _______________ Phone: _________________________________

Person(s) Interviewed: 
Name ___________________________ Division _______________________________

1. What is the business sector, or sectors, that your firm primarily operates within:
   Rank in order of dollar volume: "1" = Largest in volume
   "2" = Second in volume, etc.
   □ Industrial
   □ Process
   □ Power
   □ Infrastructure
   □ Space
   □ Building

2. What was the approximate average annual construction dollar volume of your firm over
   the last five years?

   $ ___________________________

3. Approximately how many people are employed by your firm, and how are they distributed?
   Total Employees: ___________________________
   Management (%): ___________________________
   Technical (%): ___________________________
   Administrative (%): _________________________
   Craft (%): ___________________________
   Clerical (%): ___________________________
   Other (%): ___________________________
SECTION 1

4. How many different offices does your firm maintain:

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<th>International</th>
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<tr>
<td>Project</td>
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<tr>
<td>Sales</td>
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<tr>
<td>Regional</td>
<td>Regional</td>
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5. Do you regard your firm as a full-service company or does it specialize in specific areas? (Check O

- Full-Service (Engineering/Procurement/Construction)
- Design Only
- Construction Only
- Other Specialty

In case of specialization what are the major areas of specialty?

6. In what year was your organization founded?

________

7. What forms of ownership has it experienced?

- Private
- Public
- Both: Public and Private

8. Is your firm primarily:

- Domestic
- International
- Both domestic and international

9. If your firm operates in the international marketplace, answer the following:

(a). In which foreign countries has your firm primarily operated in the past?

(b). In which foreign countries does your firm hope to operate in the future?
SECTION 1

(Question #9 continued)

(c) Does your firm:

☐ Establish an office overseas.
☐ Create a new native corporation
☐ Joint venture with a host country company.
☐ Joint venture with other companies.
☐ All of the above.

(d) On international projects does your firm:

☐ Participate in joint venture projects with firms in foreign countries. (Only for the duration of a particular project.)
☐ Establish long-term working relationships (five to ten years) with existing host country firms.

(e) In response to Question 9(d), what criteria does your firm use in opting for joint venture or long-term relationships.

Interviwee(s) Information:

10. Your primary area of responsibility is (Check only one):

☐ Planning
☐ Engineering/Design
☐ Construction
☐ Project Management
☐ Construction Management
☐ Financial
☐ Administration
☐ Middle Management
☐ Senior (Top) Management
☐ Other: ____________________________

11. Details on current position:

Job Title: ______________________________________________________________

Years at this position: ____________________________________________________

Number of immediate subordinates (people you supervise): ________________
SECTION 1

12. Details on previous position:
Job Title: ____________________________________________________________
Years at that position: _____________________________________________
Number of immediate subordinates (people you supervise): ________________

13. Other areas of the firm you have been involved in: ____________________________

14. Background experience:

Education:

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<th>Degree</th>
<th>Major Area</th>
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Experience: Number of years in each of these areas.

- ☐ Technical:
- ☐ Supervisory:
- ☐ Managerial:
- ☐ Other:

15. Did you have any construction or construction related experience, prior to working for your present firm? If yes, please explain.
(Direct or indirectly as with sales, subcontractors, specialty firms, government, developers, etc.)

- ☐ No
- ☐ Yes

______________________________

______________________________
SECTION 2: Scenario Questions

Part A

Three potential scenarios for the future of the economy are shown in Table 1. Be prepared to
discuss how you would view each of the scenarios in relation to the following five questions.

Table 1: Scenario Set #1.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Exponential increase in demand/growth limited only by resources</td>
</tr>
<tr>
<td>B</td>
<td>Continuation of current trend (slow growth)</td>
</tr>
<tr>
<td>C</td>
<td>Flatness of demand - declining demand/growth</td>
</tr>
</tbody>
</table>

1. Which of the above scenarios do you think is the most probable in the next 10 to 15 years
   in relation to the engineering and construction industries?
   - A. Increase
   - B. Continuation
   - C. Decline
   - D. Other (See below)

   If you think it will be an entirely different scenario than the ones listed please describe
   the situation as you think it will be.

2. What do you envision as the major adjustments, or alterations your company would require
   under each of the scenarios?

3. How is your company preparing to deal with the possible effects for each of the scenarios?

4. How would each of the scenarios affect your competitive position or competitive strategies?

5. What do you envision as the primary effects and problems each of these scenarios would
   have on the engineering and construction industries?
SECTION 2

Part B

Be prepared to discuss how each of the scenarios shown in Table 2 would impact the engineering and construction industries and your firm.

Table 2: Scenario Set #2.

<table>
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<th>Scenario #</th>
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<tbody>
<tr>
<td>2a</td>
<td>Another oil crisis in the next 10 to 15 years.</td>
</tr>
<tr>
<td>2b</td>
<td>The emergence of three major global centers of economic strength.</td>
</tr>
<tr>
<td>2c</td>
<td>The technological strength of the United States begins to decline and be surpassed by other nations.</td>
</tr>
<tr>
<td>2d</td>
<td>A severe shortage of both technical and non-technical workers.</td>
</tr>
<tr>
<td>2e</td>
<td>Increase/decrease in U.S. government regulations of industries.</td>
</tr>
<tr>
<td>2f</td>
<td>World-wide political stability/instability.</td>
</tr>
</tbody>
</table>

1. How they affect the nature of your industry?

2. What strategies could be adopted to remain competitive in the environment created by the new situation?

3. The global impact on engineering and construction work and the impact on U.S and foreign firms?
SECTION 3A: Structured Questions

1. What would you consider as the "key factor" for firms to remain competitive in your industry in the year 2000?

2. What role will technological advances play in facilitating a competitive approach to the engineering and construction industries?

3. What could be the primary reason(s) that would cause U.S firms to lose their competitive edge in the global marketplace in the next 10 to 15 years?

4. What types of financial packages would your firm consider adopting to win contracts:
   - In the U.S.:
   - Internationally:

5. What would you consider to be the major incentive, other than direct financial gains, for international investment in construction in:
   - Developed Countries:
   - Developing Countries:

6. Related to global competition, what would be the major concerns with regard to:
   - Differing Cultures:
   - Business Ethics:
   - Legal Structures:
   - Political Stability:
   - Socio-Economic Status:
   - Language:
   - Customs:
   - Local Technologies:
   - Corporate Structures:

7. What will be the most important personal traits and qualifications that you would consider when hiring:
   - Non-Technical Personnel:
   - Technical Personnel:

8. What would you consider to be key personal priorities of employees you expect to hire in the future labor situation?

9. What steps are being taken to adapt company policies, company images, and corporate cultures toward the predicted expectations of employees in the year 2000?

10. Do you expect a shortage of technical manpower in the year 2000?
    - No
    - Yes

11. In the event of a shortage, what strategies would your firm consider to fill the gap?

12. How can a firm prepare itself for the future labor situation?

13. What role do you expect unions to play in the construction industry in the year 2000?
SECTION 3B: ADDITIONAL QUESTIONS (TIME PERMITTING)

A: COMPETITION

1. Which business sectors, listed below, do you or your company envision as being areas with the maximum potential for growth? Why?

□ Industrial
□ Process
□ Power
□ Infrastructure

□ Space
□ Building
□ Other

2. How is your firm currently preparing itself to take advantage of the potentially lucrative area(s) discussed in question 2 above?

3. What effect does the entry on non-U.S. based engineering and construction firms operating in the U.S. have on the competitive strategies of domestic firms?

4. What will your firm have to do to remain competitive in attracting employees at the:
   Professional level:
   Craft Level:

5. How will contracting approaches for construction projects in your line of work differ in the year 2000?

6. Who do you feel are your major competitors (i.e. types of firms, foreign countries, alternative industries, etc.):
   At present:
   In the year 2000:

7. What will be the main capabilities and strengths of your competition that your firm will have to contend with in the year 2000?

8. How is your firm positioning itself to respond to the strengths and capabilities as discussed in question 8 above?

9. What new risks will need to be evaluated in the year 2000?

10. Which social pressures do you foresee shaping, or affecting, your competition in the future?

11. How will political pressures shape or affect your competition?

12. Do you envision U.S. engineering and construction firms teaming with foreign counterparts to remain competitive, both domestically and internationally, to increase their competitive advantage?

□ No
□ Yes

If yes, how, and to what degree?

13. Which geographical locations would you consider to be the primary markets of your firm in the year 2000?
   In the U.S.:
   Internationally:

14. Which sectors would you identify as being the principal clients of engineering and construction firms in the year 2000?

15. How do you think members of your industry would react to increased foreign ownership of U.S. engineering and construction firms?
16. Would a majority of the projects in the future be split between separate engineering and construction firms or will the work be accomplished by firms that do both in-house?

☐ Separate
☐ In-House
☐ Joint Venture: Design and Construction

B: Financial, Political and Legal Considerations

1. What would be the primary methods of financing construction projects in the next 10 to 15 years?
   Public:
   Private:

2. Will the financial risks associated with engineering and construction projects, from your perspective as an owner:
   ☐ Increase
   ☐ Decrease
   ☐ Remain the same

   Why?

3. Do you envision a trend towards private construction and ownership of public facilities?
   ☐ No
   ☐ Yes

   In either case, why or why not?

4. How will an enhanced concern for environmental issues (perforce or by choice), by engineering and construction industries, affect your firm?

5. What would be the most practical method(s) to finance the rebuilding of the U.S. infrastructure?

6. How will the role and/or involvement of the U.S. government in the engineering and construction industries affect:
   Private Construction, as a purchaser and regulator of construction:
   Public Construction as a provider and financier of construction:

7. How would legal differences related to engineering and construction be dealt with in the year 2000, if a global marketplace exists?

8. How would bonding and insurance issues be affected in the event of an emerging global construction marketplace?

9. What changes in the incentives (if at all) do you envision for international investment in the next 10 to 15 years?

10. How would the involvement of international organizations such as the World Bank, International Monetary Fund, United Nations Organizations, etc., both as financiers and regulators, influence international investments in future construction projects?
SECTION 3B

11. How is your firm positioning itself to respond to risks associated with a global marketplace in relation to:
   - Sources of Information:
   - Identifying Risks Involved:
   - Evaluating the Risks:
   - Quantifying the Risks Involved:

C: Management, Organization, and Structure

1. Who would be responsible for drafting policy changes to cater to the changing employee priorities suggested in question 8 on page 7?

2. What major changes in employee goals, ideals, and aspirations do you foresee, in the future?

3. What changes do you envision in the role and responsibilities of upper management in the year 2000?

4. What changes do you envision in the role and responsibilities of middle management in the year 2000?

5. How will the training managers receive, in the year 2000, differ from the methods that are being used to train managers now?

6. What changes do you anticipate in your firm's ideologies or culture, in the next 10 to 15 years?

7. What changes, or transitions, do you foresee in the organizational structure of your company in the future? Are these changes already taking place?

8. In response to question 7 above, what are the primary causes necessitating the predicted structural changes?

9. What level within your organization do you expect to be most affected by changes in the structure of your organization?

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<td>Administrative Personnel</td>
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<tr>
<td>Field or Craft Personnel</td>
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</table>

10. How will emerging globalization influence structural changes in your organization in the next 10 to 15 years?

11. In case employee retention becomes a major issue in the year 2000 what types of programs, or incentives, would your firm consider to retain employees?
SECTION 3B

12. Is the training management personnel receive today adequate for the challenges they could face in the year 2000?
   □ No
   □ Yes
   Why or why not?

13. What changes do you anticipate in the manual and craftsmen-level labor situations?

14. What technological innovation(s), do you expect will radically reshape the industry in the next 10 to 15 years?

15. How do foresee, if at all, the advent of commercial lunar construction influencing the organizational structure or scope of work of your firm?

16. Do you expect any alterations in the existing management structures due to technological advances in the year 2000?

Concluding Question (Blue Sky):
What do you envision the engineering and construction industry will be like in the year 2000?
Appendix A

Confidentiality Statement
Data Confidentiality Guidelines
CONFIDENTIALITY STATEMENT

January 18, 1990

Recognizing that work of the Construction Industry Institute will, from time to time, rely upon proprietary data furnished by its member companies, and recognizing the criticality of protecting such information while it is in CII custody, and recognizing the tremendous damage which could result from compromise of the confidential nature of such data, I commit myself to:

a. Keeping confidential any classified data coming into my possession until the originator of the data officially allows CII to handle the material without concern for confidentiality.

b. Limiting distribution of the data to others on a strict "need-to-know basis."

c. Following prescribed administrative procedures in the identification, storage, and transmission of confidential data.

d. Reproducing the data only after receiving written approval from the originator.

I understand that my personal responsibility for safeguard of confidential data will continue beyond my term of employment with CII or period of contract involvement in task force directed research.

Signature

Dr. J.K. Yates

Name (Printed or Typed)
Introduction

The Construction Industry Institute's primary goal is to advance the state of the industry through a series of well-directed study efforts. Success of these efforts depends on ready access to reliable company and project data. CII member firms have supported this concept and have welcomed these data inquiries. Maintaining data access over a long time span requires that firms remain comfortable with the use of data provided. To this end, data confidentiality guidelines have been established for the information of the CII study task force members, their researchers, and the contributing firms. Each is expected to remain vigilant to the needs for data security.

Guidelines

There are four categories of data confidentiality. Accompanying descriptions of each category are provided to assist in the communication of options.

Categories

Level 1 - No Confidentiality

Data returned directly to researcher
Identification of company allowed
Identification of project allowed
Single data points can be published

Level 2 - Medium Confidentiality (Researcher Monitored)

Data returned directly to researcher with each copy numbered
Company identification removed
Project identification removed
Single data points can be published
Raw data will be maintained in locked files with access restricted to the researcher and/or the CII Director and minimum additional staff possessing a need to know

Level 3 - Medium Confidentiality (CII Monitored)

Data returned to CII Director with each copy numbered
CII removes company identification
CII removes project identification (as far as practical)
Single data points can be published
Raw data will be maintained in locked files with access restricted to the CII Director and staff with a need to know
Level 3 - Strict Confidentiality:

Data returned to CII Director with each copy numbered
CII removes company identification
CII removes project identification (as far as practical)
Three or more data points must be averaged for any publication
Raw data will be maintained in locked files
Future access to this data is on a severely-restricted basis
(access managed by CII under direction of CII Executive Director)
Averaging and identification of data must be double-checked
before publication (double-check mechanics will be specific
in data request)

Each study task force has the responsibility of establishing the appro¬
priate level of data confidentiality for its information/data requests.
This confidentiality level should then be communicated clearly in writing
to each firm contacted. The firms in turn will decide whether they are
satisfied with the assigned confidentiality level and respond accordingly.
Normally, only Level 1 or 2 information will be solicited. Level 3 and 4
information will require data sources to submit their data directly to the
CII Director for further action. In the rare instance where special
security measures must be taken, a special confidentiality agreement may be
entered between the data source and the researcher. It shall be understood
that CII will honor all such agreements.

If more than one copy of a given document is required, the originator
will provide the correct number of copies and will record the copy number,
e.g. 1 of 3, 2 of 3, etc. on each copy provided.

It shall be prohibited for either a researcher or the CII staff to
reproduce additional copies without prior written approval of the
originator.

The study task forces and researchers are encouraged to provide to the
firms contributing data a pre-publication draft of any reports. Firms will
then be able to challenge any inaccurate data.

A final measure to assure data security includes the attestation of the
CII study task force chairman that the research study report (source
document) has been reviewed and is in conformance with data security
guidelines and agreements. It is understood that task force and research
files are appropriately protected and maintained in accordance with these
guidelines, and they will be reviewed periodically in accordance with Data
Repository Guidelines.
APPENDIX B. dBASEIV SKELETON
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