DETERMINANTS OF JOINT VENTURE PERFORMANCE IN THE CONSTRUCTION INDUSTRY: CASES FROM THE MASS RAPID TRANSIT PROJECT IN SINGAPORE

BY

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A thesis presented to the University of London
as part of the requirement for the
of the degree of
Doctor of Philosophy

Bartlett School of Architecture and Planning

University College London

May 1995

ABSTRACT

International Construction firms have extensively used joint ventures as a vehicle to enter new construction markets in South East Asia since the early seventies. Despite its immense popularity, the failure rate of such ventures has been quite alarming. While extensive research has been carried out in the manufacturing and service industries in determining the factors that influence the performance of joint ventures, similar work has not been carried out in the construction industry.

This study seeks to fill this gap. A thorough review of the joint venture literature shows that eleven factors have influenced the performance of joint ventures in the manufacturing and services industries. These are partners' objectives in forming the joint venture, partner selection process, partner size, equity control, management control, partner need, commitment, trust, cooperation, conflict and cultural differences.

The main aim of this study is to test the relevance of these factors to joint ventures in the construction industry. In this study, a longitudinal research approach is used in order to closely examine the influence of these factors on joint venture performance. Sixteen cases of joint ventures from the Singapore Mass Rapid Transit Project which was built between 1983 and 1990 were chosen for detailed examination. Data for the study was collected through personal interviews, questionnaire and search of MRTC archives. A research model was also developed in order to organise and analyse the cases in a logical manner.

The results of the study indicate that cultural differences have a significant influence over the performance of international construction joint ventures. Equally critical are the influence of partner related variables such as trust, commitment, cooperation and conflict. Task related variables such as level of equity and resource contributions have had less impact on the performance.

Key Words: International Joint Ventures

Construction Management

Singapore

Strategic Alliances

Cultural Differences

ACKNOWLEDGEMENTS

I am indebted to many individuals who were responsible in helping me to research and write this thesis. I wish to particularly record my gratitude and appreciation to the following persons without whose support and encouragement this work would not have been possible.

I wish to record my sincere gratitude to Prof. John Andrews who constantly encouraged and guided me throughout this research. I particularly appreciate the special trips he made to Singapore to discuss and review my work. I was very fortunate to have had such a perceptive, thorough and warm hearted supervisor.

I also wish to record my sincere gratitude to my colleagues at National University of Singapore, Prof. George Ofori, Prof. Kishen Mathur, Dr. S.C. Sekhar and Dr. Low Sui Peng who provided valuable suggestions to improve the quality of my work.

This thesis would not have taken shape without the help of the management of Mass Rapid Transit Corporation, Singapore (MRTC). I wish to record my deep gratitude to Mr. T.S. Low, Executive Director of MRTC who kindly permitted access to MRTC archives and Mr. Terry Hulme, Project Manager of MRTC who agreed to provide valuable comments on the performance of the various joint venture contractors who worked for MRTC. I also wish to record my appreciation to those executives in the contracting industry in Singapore for their keen interest in the subject matter and their prompt response to my request for interviews.

My biggest debt of gratitude and thanks go to my wife Kripa and my sons Anirudh and Akilesh. Kripa was always there when I needed help and support.

I wish to dedicate this work to my parents.

Govindan Sridharan
Singapore
May 1995

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LIST OF ABBREVATIONS

ADB	-	Asian Development Bank
ASEAN	-	Association of South East Nations
CIDB	-	Construction Insustry Development Board
DBS	-	Development Bank of Singapore
GATT	-	General Agreement on Trade and Tariffs
HDB	-	Housing Development Board
HK	-	Hong Kong
HQ	-	Head Quarters
JDC	-	Japan Development Company
JEL	-	Jurong Engineering Limited
JV	-	Joint Venture
KM	-	Kilo metres
LKN	-	Lim Kah Nam
LKT	-	Lee Kim Tah
MASC	-	Masculine
MNC	-	Multinational Corporation
MRT	-	Mass Rapid Transit
MRTC	-	Mass Rapid Transit Corporation
MTS	-	Mass Transit Study
MTR	-	Mass Transit Railway
MTT	-	Technology Transfer Manager
NIC	-	Newly Industrialising Countries
OCK	-	Ong Chew Kaw
OECD	-	Organisation for Economic Corporation and Development
PD	-	Power Distance
PMS	-	Preferential Margin Scheme
RDC	-	Resources Development Corporation
RSEA	-	Retired Services Engineers Agency
SAE	-	Societee' te' d'Enterprise
SES	-	Stock Exchange of Singapore
SGE	-	Societre Generale D'Enterpose
UA	-	Uncertainty Avoidance
UK	-	United Kingdom
UNCTD	-	United Nations Conference on Trade and Development
USA	-	United States of America

CHAPTER 1

INTRODUCTION

INTRODUCTION

The late eighties saw the rise of East Asia as a force to be reckoned with in the global economic arena. The new economic buoyancy and prosperity have also brought with them severe strain on the existing infrastructure facilities (Business Times, Sept 21, 1993). Efficiency in manufacturing has not been matched by the provision of telecommunication, transport, sewerage and power generation facilities in countries like Malaysia, Indonesia and Thailand. This will require massive investments in their national infrastructural programmes to sustain the economic boom, well into the next century. The Construction Industry Development Board of Singapore (CIDB) in its annual review of Asia-Pacific construction market, reported that the countries in this region would be spending up to US$ 1.16 trillion a year on construction projects alone in the next 2 to 3 years (CIDB, 1994). Figure 1.1 shows the estimates of annual construction volume of work for countries in this region. In a closed-door seminar on attracting foreign investment to the Asia-Pacific region held in Bangkok, the former Deputy Prime Minister of Thailand, Mr. Amnuay Vairavan said that massive investments would be required over the next ten years to improve the existing infrastructure in Asia and that this cannot be achieved without foreign expertise and investment.

While the markets in these newly industrialising countries, with ever increasing population, provide exciting opportunities, entries into the market are likely to be restricted to those firms which are willing to work together with local firms as a team. In this context, joint ventures provide international construction firms with an attractive

strategic option - to enter markets where the demand for local participation offers few other alternatives.

IMPORTANCE OF JOINT VENTURES

The construction firms in east Asia are predominantly small and medium sized. Singapore has nearly 3000 construction firms registered with the Construction Industry Development Board out of which less than 50 are qualified to bid for contracts valued above S$ 50 million. Malaysia has nearly 12500 contractors registered with the Prime Minister's office but only 250 firms are qualified to bid for contracts valued above M$ 50 million. Their handicap in size and the lack of experience in handling heavy infrastructure construction projects have forced the local governments to seek the assistance of large multinational companies to accomplish their economic objectives. A study conducted by World Bank (1984) showed that nearly 80% of all formal construction projects in the developing countries were accomplished by foreign firms (Simkoko,1989). It would be politically unwise for the local governments to be seen as totally dependent on foreign contractors to stimulate economic growth in their respective countries without providing sufficient opportunities for the small and medium sized domestic construction firms to participate and learn during the nation building process.

Hence the developing countries see joint ventures as one of the best instruments for meeting the competing interests of national development and the prevention of the domination of the economy by the foreign investors (Sornarajah, 1992). Countries such as Indonesia, Malaysia, Thailand and Philippines do not allow fully owned foreign

subsidiaries to operate within their countries. They require a minimum percentage of local participation in most of business ventures operating in their territories. Malaysia's new economic policy requires a 30% ownership of local Bumiputras, 40% by other Malaysians and only 30% by foreigners. The foreigners can own only up to a maximum of 49% in Indonesia and only up to 40% in the Philippines. Thailand permits foreigners to bid for heavy construction work subject to permission from the Ministry of Commerce. But normal building construction contracts are out of bounds for foreign firms. (The existence of a treaty of amity between Thailand and United States signed in 1968 confers local status to the nationals of each other. Because of this, American firms need not apply for permission to work in Thailand) (Sornarajah,1992). Only Singapore and Hong Kong, in the Asia-Pacific region, provide free access to foreign firms, as part of their free market policies.

Studies have also shown that in developing countries joint venture investments have been more successful than foreign investments made through other means (Beamish 1988). For American based companies, cooperative arrangements such as joint ventures in developed countries outnumber wholly owned foreign subsidiaries by a margin of four to one (Contractor and Lorange,1988). Killing (1983) in his study found that Japanese and European firms preferred joint ventures as a mode of entry into developing countries than did American firms. This has changed in the second half of eighties and the Americans are equally enthusiastic about forming joint ventures in the developing countries (Awadzi, 1987).

International joint venture for a construction project is a form of direct foreign investment. Construction industry cannot use the conventional forms of market penetration such as agents, distributors and licensees, since the nature of the industry precludes their use. Construction firms must rely on direct access to foreign markets either through branch offices, subsidiaries or joint ventures. A joint venture is the most popular form of entry because of the perceived benefits it brings to the host country through technology transfer, job creation and capital inflow (Sornarajah, 1992).

JOINT VENTURE - A SEARCH FOR A DEFINITION

Over the last 30 years the term "Joint Venture" has come into increasing use. Apart from numerous books published on the subject, a great number of articles have been written on various aspects of joint ventures. These research publications have unfortunately not adopted a uniform definition to describe the term "Joint Venture". The general difficulty of searching for an comprehensive definition was confirmed by the Organisation for Economic Co-operation and Development (OECD) who in their publication on Competitive Policy and Joint Ventures (1987) said: " The specialist literature gives many definitions... although none provides a truly definitive answer. They are based on one or other of the following criteria: comparisons with mergers, common objective, decision-making procedures, legal, economic and financial structures. Each of these definitions is in fact open to criticism, because none covers all the characteristics of joint ventures, in particular all the different actors, objectives, types of organisation and contractual relationships."

In the legal literature too there is considerable confusion about a precise definition for the term. One United States federal court judge remarked that "Joint Venture" remains "one of the most fluid concepts in all of the law"(Gadsby and Hannah, 1985). Joint venture is not even treated as a separate legal entity by most of the international courts. Unincorporated joint ventures are normally treated under the laws pertaining to partnership and incorporated joint ventures are treated under the laws pertaining to limited companies (Sornarajah,1992).

It is obvious from the above discussion that it is not possible to adopt an existing definition of joint venture that would be universally acceptable. There is further confusion about the usage of the term "consortium" to describe cooperative arrangements similar to joint ventures. The first book which systematically dealt with what is now described as a Joint Venture is an English publication by Bolton called Business Consortia in 1961 (Herzfeld, 1983). He did not use the word Joint Venture, even once, in his entire book, but managed to provide an almost perfect definition for the term "Joint Venture". He defined the meaning of consortium as "the organisation which is brought into being to enable two or more companies to operate as a single entity for a **prescribed and limited purpose**". He grouped consortia into two classes, "single" purpose consortium and "continuing" consortium. He noted that there was a wide difference between the problems and practical methods of living together in a joint organisation when the alliance was expected to be limited in time by the achievement of a single project, for which the alliance was formed, and the corresponding problems and methods in an organisation which was expected and intended to be permanent. Andrews (1987) in his paper on Construction Project Management in Joint Ventures agreed with the purpose of creating

a consortium for a prescribed and limited purpose. He noted that consortium was best for those desiring no permanent continuing association, for which purpose there were better and simpler forms of organisation. He also observed that the term joint venture and consortium were used interchangeably in the literature. He felt the two terms referred to the same process of forming a single temporary organisation by two or more parties, preferably disparate, operating under joint control, for a prescribed and limited purpose.

Other researchers have also concurred with Bolton's and Andrew's views on the definition of a consortium but added a few more qualifiers. In his Ph.D thesis on Export Bidding By Consortia, Mathur (1984) defined consortium as "An ad-hoc arrangement by two or more firms to co-operate for a limited period of time with the intention of obtaining and executing a capital goods contract. The characteristic that distinguishes consortia from other relationships is that all partners agree to accept **joint and several responsibility** for providing the goods and services contracted for. Therefore, the question whether a particular relationship can be designated as a consortium is not resolved by examining the legal or management structure adopted by the "partners" but by examining the contractual relationship they together establish with the "client". Bolton (1959), in his article on Construction Consortia, was the first author to emphasise the need for "several and joint responsibility" to the client. This particular attribute of the consortia brings out the importance of the client in determining the existence of consortia. Without the award of a contract to the consortium by a client, there is no reason for a "single" purpose consortium to exist. This dependency on award of a contract also shows the ad-hoc and temporary nature of this type of organisation in the construction industry. Mathur argued the term "consortium" used in his definition significantly differed from the one that is

used to describe manufacturing, banking and marketing joint ventures that have an on-going activity not directly related to any one project and which were usually understood to exist only when they had a distinct legal or organisational personality. This distinction in definition of joint venture and consortium is supported by Kurkela (1981) in his book on International Construction and Project Export Contracts. He observed that a joint venture company must not be confused with joint venture type of cooperation based on an agreement of the parties only and usually entered into in order to maximise the use of the technical and economic resources of the parties in projects, either technically or economically, would be impossible for either of the parties to undertake on its own. Such type of temporary arrangement based on a written agreement, he argued, could be referred to as a "Consortium". The term Joint Venture, he observed, referred to a more permanent cooperation in the form of a company. He noted that this form of arrangement was likely to continue for an indefinite period.

Most of the business literature on joint ventures concern the manufacturing industry. Tomlinson (1970) in his study of international joint ventures in India and Pakistan with U.S. firms defined joint venture as " A commitment, for more than a very short duration - of funds, facilities and services by two or more legally separate interests, to an enterprise for their mutual benefit". This definition confirms the earlier discussions about the more permanent nature of the term joint venture. Beamish (1984) defined joint venture as "Shared equity undertakings between two or more parties, each of whom holds at least five percent of the equity". He is one of the earlier researchers to bring the issues of sharing and control into joint venture definition. Shenker and Zaira (1987) doubted the ability of a minimum five percent share holder to make anything but a token contribution

to the management of the joint venture. In their view, an international joint venture is: " A separate legal organisational entity representing the partial holdings of two or more parent firms, in which the headquarters of at least one is located outside the country of operation of the joint venture. The entity is subject to the joint control of its parent firms, each of which is economically and legally independent of the other." They suggested a minimum share holding of at least 25 percent for the minor shareholder to have any meaningful joint management control. In the opinion of the present researcher, it is not really important whether the minority share holder has five or twenty five percent share holding in the joint venture; what is important is to have a written provision in the joint venture agreement giving him the right to control.

Considering the wide range of definitions given to the term "Joint Venture", it is quite possible that the term is incapable of having a single definition. Perhaps joint venture can be considered as a generic term. Rather like a species of an animal, the term cannot be adequately defined and descriptions tend to mislead for want of truly uniform characteristics shared by the entire species. Experts are united in agreeing that they can recognise a sample of the species when they see one (Linklater and Paines, 1990).

The joint ventures in the construction industry are mostly "partnerships for a single transaction". But there is a growing tendency among international firms to form a long term strategic alliance with their local partners to pursue work jointly beyond a single contract. Some of the joint ventures described in the case studies of this thesis have adopted this long term strategy. Hence the usage of the definition of a consortium provided by Bolton is not adequate for the purpose of this research. Gadsby and Hannah

(1985) in their paper on international joint ventures in the construction industry identified five essential criteria that characterised a common law "joint venture". To constitute a joint venture the venturers must:

1. Agree usually in writing, to form a joint venture.
2. Contribute some resources or skills to the common undertaking.
3. Limit the venture to a single identified project or transaction or group of projects or transactions.
4. Share a right of mutual control over the enterprise.
5. Share all profits or losses.

These five key criteria encompass all the ingredients of joint ventures recommended by various researchers and will be used in this research to characterise joint ventures.

PURPOSE OF THE STUDY

An international construction joint venture (JV) is like an "economic marriage". Like a marriage itself, a joint venture offers great opportunities to exploit and share resources, skills and financial strength. This type of organisation may permit two firms acting as a unit to undertake projects which neither could have accomplished alone. Therefore the international joint venture is highly desirable. At the same time, a joint venture shares with marriage many problems and pitfalls which need to be avoided. There is an indispensable need for mutual trust, sharing of resources and information, and confidentiality (Gadsby & Hannah, 1985). Should any of these essential ingredients be

lacking, the joint venture is likely to weaken and eventually fail. Literature is full of studies on joint venture failures. Killing (1982) reported a thirty percent failure of joint ventures formed between United States firms and partners from the developing world. Beamish (1985) found a 40 to 50 percent instability rate of JVs in developing countries. Based on these studies, there is a one in three chance of failure of a newly formed joint venture. In a study of the influence of control and conflict on performance of Japanese-Thai joint ventures, Tillman (1990) found that conflicts between partners caused JVs to fail. The rate of failure reported by the past studies is a very disturbing fact, requiring a thorough examination of the various factors that affect the satisfactory functioning of the JVs in general.

The research problems examined in this study are adapted from the studies of several scholars(Tomlinson, 1970; Killing, 1983; Beamish, 1984; Awadzi,1987) who studied the performance of JVs in the manufacturing industry. An exhaustive literature search also showed that no similar study has been conducted in the construction industry. Andrews (1984) noted that JVs have a long history but a short literature. Another author commented that although JVs were growing in importance in the construction industry, very little research has been devoted to the operation and management of JVs. The purpose of this study is to fill that gap.

The study would attempt to answer the following research questions:

1. What are the motivations for foreign contractors and their local partners to form JVs?
2. To what extent do host government regulations and attitudes impact upon the decision to enter into JVs?
3. What are the relative bargaining powers of the partners and how does this influence the partner selection process?
4. What are the equity contributions of the partners and how does this influence JV performance?
5. How do structural and behavioral factors such as trust, commitment, and need influence the performance of the joint ventures?
6 Do conflicts arise between partners? How are they resolved? What influence do they have on performance?
7. Do JVs of one nationality perform better than JVs of other nationalities? What is the effect of cultural differences between partners on JV performance?

These research questions are presented in a schematic form in Figure 1.2.

NEED FOR THE STUDY

International construction joint ventures are increasingly becoming popular both with the multinational construction firms and local governments in order to achieve their individual objectives. This increased usage is likely to continue in the Asia-Pacific region for several years to come. This prediction is based on the inability of even the largest firms to "go

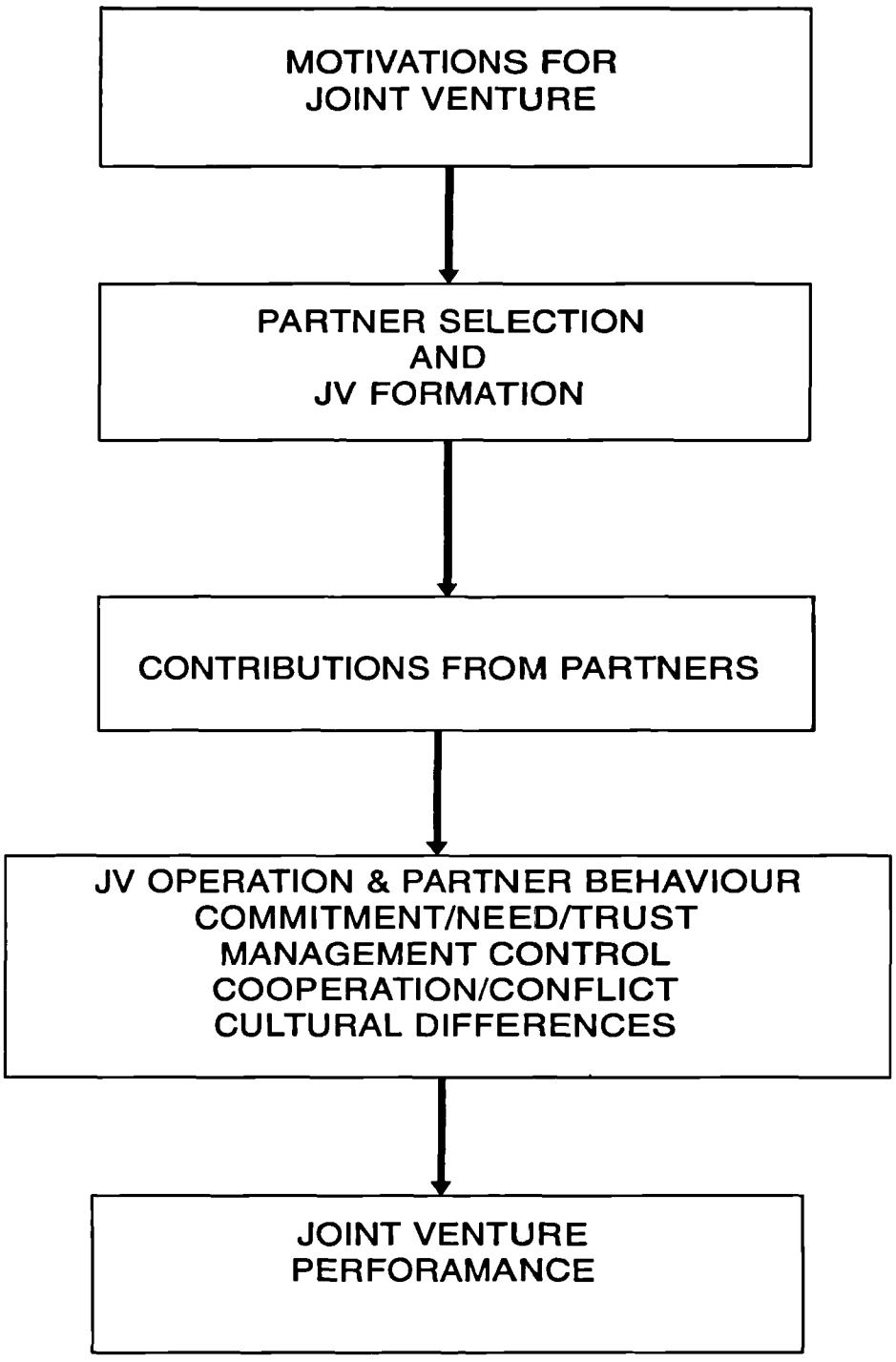

Figure 1.2 Elements of the Study

for it alone" due to the high cost of large infrastructure projects, high level of risk involved in the projects and the rapid rate of technological development among the leading contractors. If the prediction about the growth is true, then there is a need for research that would provide insight into the workings, and their ramifications, of the international JVs.

Second, a perusal of the available literature indicates that research on joint ventures is a favourite topic among researchers in the manufacturing and business fields. Even there the focus is on specific aspects of joint ventures such as partner selection, influence of parent control on the performance of joint ventures, influence of conflict on JV performance, etc. Only a handful of works deal with different facets of joint ventures simultaneously. As noted earlier, there is a dearth of comprehensive research on joint venture performance. This study expects to fill the gap in the available literature in the construction industry by providing an integrated framework for analysis of JVs. It will attempt to link the motivations for forming joint ventures, the choice of JV structure, partners' contributions to the venture, inter-partner relationships that develop during the operation of the JVs, and joint venture performance. The results of the study are expected to provide useful guidelines for the international construction industry in forming and operating effective and efficient international joint ventures.

SCOPE OF THE STUDY

This study uses a case study approach to investigate the factors affecting the performance of JVs. This approach is chosen in order to observe a large number of factors that affect

the performance of joint ventures over a period of time. The Singapore Mass Rapid Transit Project constructed between 1983 and 1990 employed sixteen JVs as contractors to construct the sixty six kilometre railway transit system.(The project is explained in detail in Chapter 4.) This huge data base lends itself adequately to study the validity of hypotheses suggested in the third chapter.

ORGANISATION OF THE THESIS

The first chapter defines the research problem and sets forth the purpose, need and scope of this study. The second chapter presents a review of the literature. The review is divided into three sections. The first section examines the various factors that have been identified by previous researchers that influence the performance of joint ventures. The second section reviews the relationship between these factors and joint venture performance. The third section examines the literature on the measurement of JV performance.

The third chapter develops the conceptual model to be used for the analysis of the cases presented in the following chapters. A set of research propositions and hypotheses are developed to study the relationship among the variables identified in the model.

Chapter four presents the description of the Singapore Mass Rapid Transit project. This chapter identifies the nature of the project, the description of the various contracts that were awarded to joint ventures and the government's influence on the project.

Chapters five to seven analyse the performance of Local, i.e., Singaporean contractors in JVs with foreign partners. In Chapter five, the performance of JVs with European contractors as partners is studied. In Chapter six, the performance of JVs with Japanese contractors as partners is examined. In Chapter seven, the performance of JVs with newly industrialising countries'(NIC) contractors as partners is reviewed.

Chapter eight (Comparison of Cases) presents a comparative analysis of the group case studies and tests the validity of the hypothesis developed in Chapter 3.

Chapter nine (Summary,Conclusions and Recommendations) presents a summary of the research findings. Areas of future research are indicated to motivate further research on international construction JVs.

CHAPTER 2

LITERATURE REVIEW

INTRODUCTION

This chapter is a review of prior literature on factors affecting the performance of international JVs. The main objective of the review is to critically examine the work of other researchers in this area. A comprehensive data base search was first done to establish the total amount of literature available on JVs. A detailed secondary search was done to determine the number of articles or books written on joint ventures in the construction industry. The results of the data base search are presented in Table 2.1.

TABLE 2.1

RESULTS OF DATA BASE SEARCH

No	Name of the Data Base	Period of Search	Total No. of articles on JVs	No. of articles on construction JVs only
1	ABI/INFORM	1987-94	6276	289
2	BRITISH THESES COLLECTION	1984-94	13	0
3	COMPENDEX	1990-93	57	7
4	DISSERTATION ABSTRACTS INT.	1861-94	277	1
5	ECONLIT	1969-94	287	0
6	ICONDA	1987-94	37	37
7	LEGAL PERIODICAL	1987-94	315	4
8	PSYCHOLOGY LIT.	1987-94	13	O
9	PAIS	1972-94	463	2
TOTAL ARTICLES			7738	340

Studies on JVs in the construction industry amount to less than five percent of total number of articles written on JVs. The more revealing statistics is that only one thesis out of 290 theses written on JVs is on construction JVs. It is this lack of research on JVs in the construction industry that prompted the present researcher to carry out the current study.

Due to the lack of literature on construction JVs, the literature review presented in this chapter is heavily biased towards work done on manufacturing and services JVs. Rashid(1991) expressed similar difficulties in finding adequate literature on global strategies pertaining to international construction industry for his doctoral research. He observed that his literature review indicated the confusion that prevailed as to whether construction was strictly a manufacturing or services sector. The World Bank included construction as part of the industrial sector along with manufacturing and mining while General Agreement on Trade and Tariffs (GATT) excluded construction from the manufacturing sector. United Nations Conference on Trade and Development (UNCTAD) argued that construction should be split into a services component and a manufacturing or goods component. The above arguments indicate that the outputs of construction retain the characteristics of manufacturing and services. The present researcher agrees with Rashid's hypothesis that since construction straddles across both the goods as well as services sectors, modifying existing scholastic work should be adequate to bring the industry before academic scrutiny. Lim and Low (1993) have identified a set of key areas in which the construction sector differs from the manufacturing sector. Their findings are summarised in the following section.

The products of construction are invariably stationary. While the final product is stationary, the labour force and materials which services the end product is highly mobile and move to the areas where they are required. On the other hand, the end products of manufacturing are highly mobile. But during the manufacturing process such as assembly of televisions, cars etc., the components of production move along the assembly line to the locations where the labourers are for final assembly as end products. Because assembly is readily mechanised, manufacturing is more amenable to the use of robotics and automation. The efforts made to improve productivity are more likely to succeed in the manufacturing environment than in construction which is subject to vagaries of weather, difficult sub-soil conditions and coordination among various trades, etc.

Standardisation of design is often not possible in construction. This means that the beneficial influence of the learning curve can not be exploited. On the other hand manufacturing efficiency and improved productivity are dependent on using standard designs.

The project organisation assembled by the client for constructing a product is temporary in nature. The architects, engineers and contractors are appointed to perform a specific task and their appointment is terminated at the end of the project. The manufacturing organisation is more permanent and the members of the project team often come from the same organisation.

Building owners are often deeply involved in the construction process whereas the buyers of manufactured products generally have no direct access to the production process, nor

have any significant influence over the product design.

The buyers of new buildings pay before the product is completed. Because new construction may involve large capital outlay, progress payment by the client to finance the construction is a critical aspect of the construction industry. In the case of manufacturing, the buyers of finished products pay for the goods only at the time of purchase.

The durations of construction projects or their individual phases are relatively short compared to the life cycle of the manufacturing process. Hence it is expensive to restructure the construction project work force or organisation once it is in place. Reorganisation in the manufacturing industry are often carried out in a methodical manner without disrupting the manufacturing process.

The above differences are by no means exhaustive. But they do highlight that unlike manufacturing, construction industry is a more complex and fragmented industry. Many authors have suggested that application of manufacturing management practices and techniques to construction would improve the overall performance of the industry

REVIEW OF EXISTING LITERATURE

The review is divided into three sections. The first section examines the various factors that have been identified by previous researchers that influence the performance of joint ventures. The second section reviews the relationship between these factors and joint

venture performance. The third section examines the literature on the measurement of JV performance.

MAJOR DETERMINANTS OF JV PERFORMANCE

Prior literature has identified twelve important determinants that can influence the performance of a JV. These determinants were chosen on the basis of their choice as a research topic by various researchers. They are motivations for forming a JV, criteria for partner selection, compatibility of objectives, equity control, management control, partner need, commitment, inter partner trust, cooperation, conflict, size compatibility of partner firms and cultural differences.

Motivations for forming an international JV

Many researchers have pointed out that Multi National Corporations (MNCs) would prefer to operate wholly owned subsidiaries in foreign countries than to share their knowledge with local partners through various forms of cooperative arrangements such as a JV, licensing arrangements etc. (Lacraw, 1984; Beamish, 1984). The very nature of these arrangements present a danger to the MNCS for dissipation of firm specific advantages through sharing of resources.

Despite this natural reluctance to form JVs, JVs are popular in both developed and developing countries (Awadzi,1987). Killing (1983) established three main reasons for forming international JVs in developed countries. They are : 1) host government

persuasion or legislation; (2) partner's needs for other partner's skills; and (3) partner's needs for other partner's assets. He observed that 17 percent of the JVs in his study were formed due to government persuasion, 64 percent due to the skills needed and 19 percent because of assets possessed by the other partner. Beamish (1984) conducted a similar study in developing countries and found that 57 percent of the JVs were formed due to host government requirements, 38 percent due to the need for other partner's skills and only 5 percent because of the need for other partner's assets. Tomlinson (1970), Janger (1980) and Gullander (1976) all noted that government persuasion or restriction was the main motive for the MNCs to forming a JV.

In the absence of host government interference, the MNCs form JVs with local firms in order to obtain resources from or pool resources with local firms (Awadzi, 1987). Dutta (1988) identified five reasons for forming a JV by the MNCs. They are: 1. entering new and potentially profitable markets; 2. sharing greater economic risks in new business ventures; 3. satisfying nationalistic demands and lessening risks of expropriation; 4. maintaining good relations with host governments; and 5. pooling organisational know-how to realise synergistic benefits.

The literature on motivation of local firms to form JVs is scattered and few. It is generally accepted that one of the primary reasons for the local firms to form JVs is to acquire technology. Reynolds (1984) in his study of Indian JVs with Americans noted that the Indian partners considered technology assistance from American partners as important. Freidman and Beguin (1971) observed that risk sharing and access to foreign capital are also important motives for local firms to consider formation of JVs with foreign partners.

They also identified five major objectives sought by host governments. They were:

1. Integration of the JV in the national economic plan;
2. Financial contribution of the foreign investor to the JV;
3. Local Manpower training, including training of managerial and non-managerial workers;
4. Development of import substitution and or export promotion industries;
5. A share in the large-scale social development projects with large MNCs.

Whatever may be the motivation for forming a JV, one has to recognise that there are additional costs involved in forming and operating a JV. It is only when the benefits accrued from forming a JV exceeds the cost, then only the JV can be stable (Beamish, 1984).

Criteria for Partner Selection

Many researchers have suggested that the choice of a partner may be an important variable influencing the performance of a JV, since it influences the mix of skills and resources which will be available to the venture and thus the JV's ability to achieve its strategic objectives (Peterson & Shimada, 1978; Tomlinson, 1970; Walmsley, 1982; Killing, 1983). These researchers have also highlighted the difficulties in choosing the right partner. Killing (1983) compares the recommendations about selecting a JV partner to that of recommending to one's daughter the kind of man she should marry. He argues," One of the greatest problems in partner selection is that many of the characteristics which one might be willing to agree are generally desirable, such as honesty, dependability and

trustworthiness, typically only become evident in times of stress, such as in the middle of the crisis three years after the venture has been formed".

Tomlinson (1970) who did the pioneering study in this aspect, examined six categories of selection criteria. These were:

1. pressure to select a specific partner due to the host government's direct or indirect directives or regulations;
2. specific facilities possessed by the local firm, such as plant, marketing or distribution facilities or a strong market position;
3. local resources of managerial and technical personnel, materials, components, or local capital;
4. status and capability of the associate in dealing with local authorities and public relations.
5. favourable past association as agent, customer, licensee or as a partner in other undertakings; and
6. ability to provide a local identity.

Tomlinson's (1970) research identified that MNCs who possessed resources that the host government considered important to its development were able to choose their partners freely. He also noted that past association was the most important for selecting a particular partner. While Tomlinson (1970) considered the categories of facilities, resources, partner status and forced choice as equally important criteria for selection, he found that MNCs did not consider local identity as an important criterion.

The most comprehensive work on partner selection was conducted by Geringer (1986). He distinguished between criteria associated with the operational skills and resources which a venture requires for its competitive success (he termed these as task-related criteria) and criteria associated with the efficiency and effectiveness of partners' cooperation (he termed these as partner-related criteria). His research study which included interviews with senior executives of 90 JVs that were operating in the U.S.A., noted that many JVs did not conduct a systematic partner selection process. He noted that several JV partners were primarily identified through a chance meeting at a trade fair, a comment noted in a newspaper, a meeting resulting from executives having adjoining seats on an aeroplane flight etc. He observed that successful JVs however employed a systematic two stage screening process. They first screened the potential partner on complementarity on task-related dimensions and only when the potential candidate satisfied these criteria, did the firm proceed to check the potential partner's ability to satisfy partner-related dimensions. Geringer (1986) noted that partner-related criteria such as compatible management, trust and commitment and cultural differences are very complex issues and can only be evaluated subjectively.

The only reason for a firm to pursue a JV is that it is the best route to achieve a particular objective. The partner selection process must be preceded by clear definition of what are critical needs that is expected to be provided by the potential partner in order to achieve the chosen objectives. One should not expect a perfect match. But an orderly selection process should be able to present the firm with a choice of potentially compatible partners to choose from.

Compatibility of Objectives

Tomlinson (1970), Simiar (1982) and Tung (1984) have all suggested that the success of a JV primarily depends on compatibility of the partners' objectives. In their opinion JVs are primarily formed to maximise the partners' joint objectives. However it is not uncommon that there will be conflict of interest between the joint objectives and partners' individual objectives often affecting the smooth operation of the JV.

Chowdury (1989) observed that the discrepancy in the primary objectives of parent firms of the JVs might arise from a) difference in partners' cultural backgrounds; b) incompatible characteristics of the parents (e.g., functions, size, resources and orientations); and c) changes in the parent firms' or JV's environment since the establishment of the JV. Wright (1979) and Simiar (1982) were of the view that differences in cultural backgrounds of partners as reflected in norms, expectations, business philosophies and policies can result in goal incongruence. Simiar (1982) observed in his study of Iranian JVs with MNCs that the global orientation of the MNCs often clashed with the local emphasis of the local partner.

Yashino (1968) and Tung (1984) who have extensively studied JVs between Japanese firms and Western MNCs viewed goal incongruence often occurred due to disparity between primary benefits expected by the parents. For example, if the primary objective of the MNC is to establish a presence in the host country and the local partner's primary objective is to generate quick profit, these two conflicting objectives are likely to cause friction between the partners. In such situations, attainment of goals by one partner would

result in the reduction of goal achievement by the other partner.

Equity Control

The level of equity ownership in a JV by each partner is often the result of a lengthy and tedious negotiation process. Many MNCs and local firms equate equity position with control over critical functions and decisions in the JV. Several researchers have established correlation between equity ownership and performance of JVs. Killing (1982) and Schaan (1983) conducted in-depth interviews with senior executives of a small number of JVs to determine the relationship between performance and equity ownership. They found that JVs in which the MNCs held a minority or majority share performed better than the JVs in which the partners held roughly equal shares.

Lacraw (1984) studied the equity ownership obtained by 153 MNCs in JVs with partners in seven ASEAN countries. He found that MNCs who possessed and contributed critical resources to the JVs demanded and obtained majority ownership in the JV. This supported the findings of Freidman and Beguin (1971) who also found that MNCs were particular in obtaining majority ownership if the JV was to deal with complex technology previously developed by the MNC. He supported Killing and Schaan's findings that JVs who had equal ownership performed poorly compared to the JVs in which MNCs had majority ownership.

But researchers (Kojima, 1973, Ozawa 1978) who extensively studied Japanese JVs in Asia noted that Japanese firms, despite taking a lower share of equity ownership,

managed to retain control over the operations of the JV. Lacraw (1984) also noted similar patterns among the Japanese firms who through control of critical resources managed to control the operation of the JVs.

The evidence from this review is that majority equity ownership is neither necessary nor sufficient for maintaining effective control. Control is not an issue as long as MNCs have a majority ownership but it becomes one when equity ownership is shared as in the case of a 50-50 joint venture or where a MNC has a minority ownership share and the local partner desires to implement decisions contrary to the interests of the MNC.

Management Control

In their pioneering research on management control of JVs, Freidman and Kolmanoff (1961) distinguished between "voting control" or de jure control, through majority voting rights, and de facto control, which is the managerial control a partner actually exercises. They found that MNCs effectively controlled the JVs of which they are partners through supplementary agreements, representation on the board of directors and veto power over critical decisions.

Schaan (1983) in his study of Mexican-Canadian JVs, found that MNCs focused on controlling specific tasks rather than trying to win overall control of the entire operations. He also found that the MNCs used both positive and negative control mechanisms to get their way. They used positive control whenever they were in a position to influence the decisions in accordance with their overall objectives and used negative control to block

decisions that would undermine their authority.

Hayashi (1978), who extensively researched into Japanese JVs found that they exercised a significant influence on the JVs through strategic placement of their personnel in key positions. He noted that even in situations where the host government restricted the number of expatriate staff, they brought their staff into the project as "Technical Advisors" to the local managers. He observed that the Japanese unlike the Westerners, were more concerned with the managerial control of the JV than with equity control.

The literature is divided regarding the influence of foreign partner's control on JV performance. Researchers such as Killing (1983) and Schaan (1984) generally concluded that foreign partner control was positively correlated with the success of the JV. However, researchers such as Tomlinson (1970), Beamish (1984) and Artisan (1985) found a negative correlation between foreign partner control and JV performance.

These apparent contradictory results may be the result of the partners failing to distinguish between controlling the direction of the venture and control of day to day operations of a particular project undertaken by the JV. Andrews (1984) suggests that this distinction is essential for JVs to succeed.

It can be concluded from this review that management control has an influence on JV performance. The final outcome of the influence is dependent on the mechanisms used to retain effective management control and complexity of the project undertaken.

Partner Need

Beamish and Lane (1983) were the first researchers to establish partner need, the long-term mutual need between the partners for each other's resources and contributions as an important determinant of JV performance. Beamish (1984, 1988) established through his extensive study of international JVs in developing countries the partners have expressed mutual need for the following types of resources: human resources, market access, government or political access, and specialised skills or knowledge. He studied the relationship between performance and partner need and concluded that partners of successful JVs showed a long-term need for each other's contributions while the unstable ones were characterised by short-term emphasis on partners' contributions. He further concluded that successful JVs were characterised by strong partner need while the unsuccessful ones showed a weak need for partners' contributions.

JV performance literature correctly points out that mutual long-term need between partners will have a positive influence on the performance of the JV. There is no need to form a JV if there is no need for a partner. JVs that are formed only to comply with host government regulations may perform poorly since in such ventures the foreign firm may not consider the contributions of the local partner as important.

Partner Commitment

Tomlinson and Thompson (1977) defined "commitment" in terms of whether the MNCs perceived the JV with a local partner as a significant part of their global strategy. They

observed on the basis of a study of 11 Canadian JVs in Mexico, that commitment is a very important determinant of a JV's success. Tomlinson and Willis (1978) extended this research to study the relationship of commitment to the JV by both local and foreign partners. They noted that commitment to provide on a long-term basis, resources and capabilities to the specific needs of the JV is an important prerequisite for its success.

Beamish and Lane(1983) and later Beamish (1984, 1988) extensively studied the relationship between commitment and JV performance. Beamish and Lane (1983) studied the relationship between commitment and JV performance in 37 Canadian and Mexican JVs and Beamish studied the same relationship in 16 international JVs in developing countries. Their study supported the major conclusions of Tomlinson's (1970) earlier studies, that there is a positive relationship between commitment and JV performance.

In order for the JV to succeed, all the partners to the JV agreement should have a total commitment to the JV as well as to each other. Without need there is no commitment and without commitment the performance of the JV will inevitably suffer.

Inter-partner Trust

Some of the studies that examined the relationship between trust and JV performance concentrated on international JVs between U.S. and Japanese firms (Peterson and Shimada, 1978; Tung, 1984). These researchers identified mutual trust as an important variable affecting the success or failure of a JV.

Peterson and Shimada (1978) who studied Japanese-American JVs found that the Japanese placed heavy emphasis on mutual trust in their relationship with their American partners. Peterson and Shimada (1978) observed that the Japanese considered contractual provisions as mere intentions than strict obligations and this, they attributed to the nature of Japanese culture. Peterson and Sullivan (1982) found that Americans on the other hand placed heavy emphasis on formal and binding contracts to conduct their business with their Japanese partners. This behaviour can also be traced to the American culture. Peterson and Sullivan (1982) confirmed through their research that perception of trust is directly related to cultural backgrounds of the partners.

It is not possible to conduct a JV business based purely on trust or on a heavy reliance on the conditions of the JV agreement. It is not possible to draw a set of clauses that would take every future contingency into account. Mutual trust is essential to overcome the limitations of the contractual agreement.

Size Compatibility of Partner Firms

Franko (1971) studied the relationship between the size of the partner firms and JV stability. He observed that larger firms who have a high risk-bearing capacity, were naturally reluctant to form a JV. In cases where they had formed JVs with local partners only to satisfy regulatory needs of host governments to facilitate market entry, such ventures he hypothesised would be very unstable and were likely to be dissolved. However, Franko (1971) could not conclusively prove his hypothesis.

A few researchers studied the relationship between partners' relative sizes and JV performance. Davidson (1982) suggests that in a large-small pairing, the larger partner may find it difficult to keep its entire focus on the activities of the JV. The relative size might also result in different attitudes toward disposition of profits. The larger partner may prefer growth compared to dividend pay out while the small partner may prefer just the opposite.

The findings of Roulac (1990) is used here to summarise the effect of inter-partner size on JV performance. He cited several reasons why a small-large pairing can result in JV instability. Indifference to the operational problems of the JV by the large partner may have serious consequences on the smaller partner whose resources and revenue expectations are closely tied to the JV project. If the project demands the contribution of additional resources to resolve the existing problem, the smaller partner may find it very difficult to contribute its share of the required additional resources. This may result in the ultimate collapse of the venture itself. (The relative importance of the JV project to partners of different sizes is shown in Figure 2.1.)

Cooperation/Conflict

The review of the effect of cooperation/conflict on JV performance has been a popular topic for many researchers. Beamish & Lane (1982) studied the effect of conflict on 31 JVs in developing countries and identified 58 different problems resulting from conflict between partners. Some of the key variables causing conflict identified by Beamish & Lane (1982) were: partner's eventual dispensability; one or both partners' use of JV as

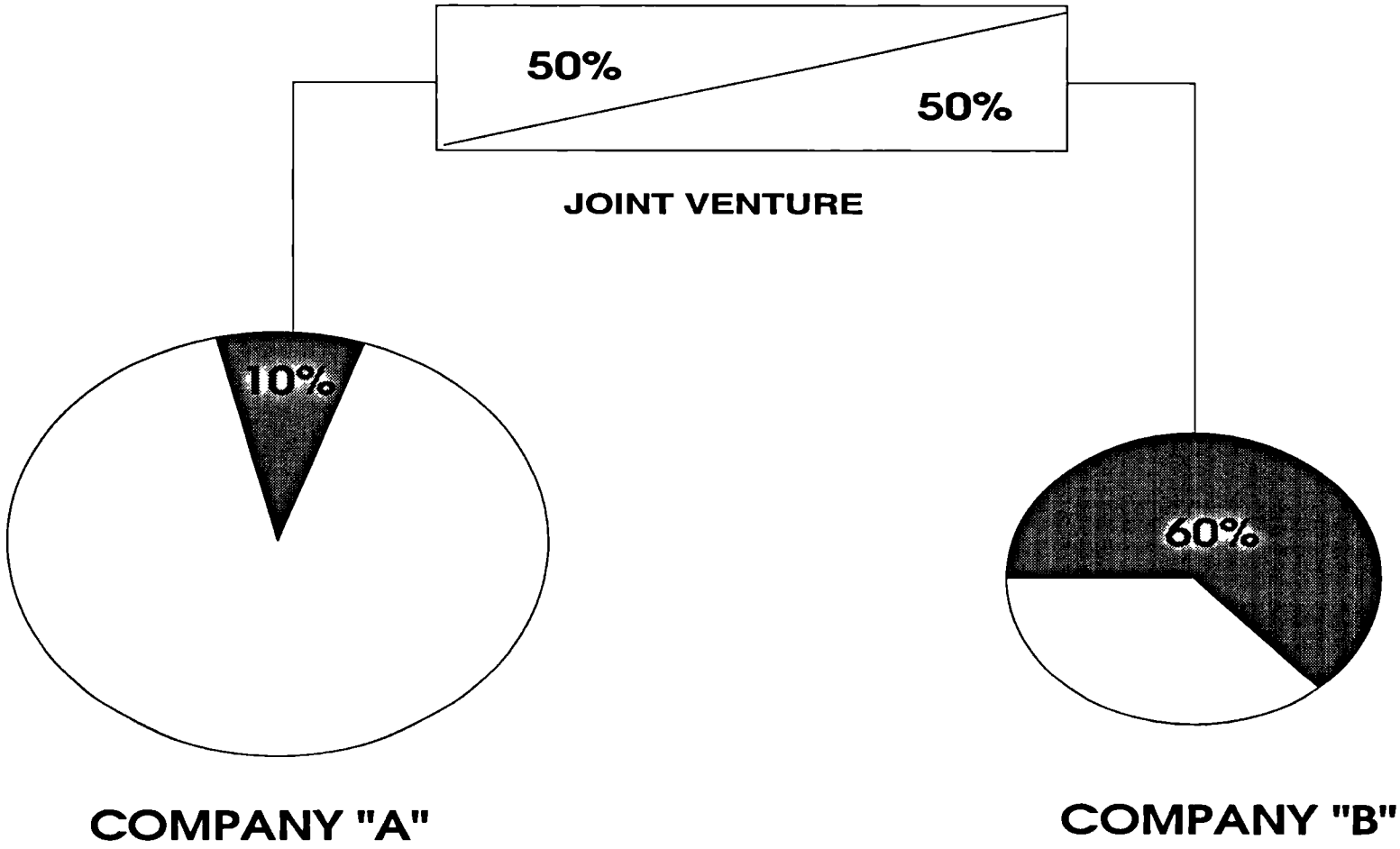

Figure 2.1: Contributions from JV to Partners' total revenue

a training ground; short-term commitment of one or both partners' to the JV; disparity of goals and long-term vs short-term performance needs. Simiar's (1983) research supported Beamish & Lane's (1982) arguments that goal incongruence caused severe conflicts.

Awadzi (1987) studied the power of one partner to interfere with the goal attainment of another partner and noted that conflict is possible only when the interfering party has some power. It follows from this argument that more resources one partner contributes relative to the other partner, the more power the partner would have to influence and/or interfere with the attainment of the other party's goals (Awadzi, 1987).

Task interdependence can also be a serious source of conflict.. The greater the task interdependence among partners, the greater the potential for conflict. Another source of potential conflict is need to share resources. The JV can run into rough weather if one of the partners does not want to share its resources for fear of losing their firm-specific advantages. Killing (1982) has observed that power sharing arrangements can also be a source of conflict. He concludes that conflict is more likely to develop when power is equally balanced. Awadzi (1987) supports this finding through his study on JV. He observes that where power is unbalanced, there is less potential for conflict.

It can be summarised that conflict can happen due to one or more of the following sources: the power of one partner to interfere with the goal attainment of another partner; task interdependence; need to share or pool resources; power sharing and most critical of them all, cultural differences. The focus of this study will be on determining the specific areas of conflict and how these conflicts can upon impact the performance of the JV.

Cultural Differences

JVs develop their own culture with contributions from the partners, but also with whatever cultural values other organisational members bring with them. It is this process of culture in action, i.e. the development of a new culture for the JV, which is a source of many conflicts, and a major contributor to the failure of many JVs (Swierczek, 1994). The influence of culture is felt in various aspects of JV formation and operation. Compatible objectives are difficult to establish between partners who come from different cultures. Culture plays a significant role in the partner selection process. Cooperation and coordination, two critical variables for the success of joint venture operations can be impossible when cultural conflicts surface.

The influence of culture on JV performance is succinctly expressed by Kilman et.al.(1985)

> Culture is the social energy that drives-or fails to drive the organisation. To ignore culture and move on to something else is to assume, once again, that formal documents, strategies, structures, and reward systems are enough to guide human behaviour in an organisation and that people believe and commit to what they read or told to do. On the contrary, most of what goes on in an organisation is guided by the cultural qualities of shared meaning, hidden assumptions and unwritten rules.

No literature review on culture is complete without reviewing the work of Hofstede's (1980). He defined culture as, "the collective programming of the human mind, obtained in the course of life, which is common to the members of one group as opposed to the

another" (Hofstede, 1980, p 61). On the basis of survey of over 116,000 employees of IBM in 50 countries and the application of an extensive method of factor analysis, Hofstede (1980) grouped the employees according to similarities on four specific dimensions of culture: Individualism-Collectivism, Power Distance, Uncertainty Avoidance and Masculinity. The four cultural dimensions are briefly discussed below:

Individualism vs Collectivism:

"Individualism describes the relationship between the individual and the community in a given society" (Hofstede, 1980, p 213). He explains that highly individualistic members of the group will take steps in weighing how much the company will allow them to fulfil their personal goals. Commitment to the company often comes from an expected personal gain that can be derived from participation. Low Individualism, in contrast, is manifested in a desire of the persons to maintain social ties and personal relations in the organisations they belong to. Hofstede (1980) describes a collective group as one which commits itself to maintain social ties to fulfil obligations imposed by group expectations.

In an individualist culture task comes before the relationship; in collective culture, the relationship has precedence over the task (Hofstede, 1983). He argues that for Project Management to succeed in organisations where personnel from both individualistic countries and collectivist countries are jointly involved, sufficient time should be provided in the project schedule for relationship-building.

Power Distance (PD):

A greater power distance indicates an accepted hierarchy in organisational relationships. One of the consequences of a high power distance society is high authoritarianism as a social norm. In high PD cultures, workers are comfortable with close supervision. Subordinates feel more comfortable with superiors who are autocrats - and may choose not to participate in the decision-making process. In low PD countries, low authoritarianism is the social norm. In these countries subordinates may even be encouraged to take the initiative.

Uncertainty Avoidance (UA):

This refers to tolerance of ambiguity. In societies with high uncertainty avoidance, people try to limit conflict and avoid situations where risk is high. To achieve this the society will try to avoid ambiguous situations by establishing greater career stability, formal rules, intolerance of deviant ideas or behaviour, and a belief in absolute truths(Basset, 1991).

Masculinity (MASC):

This dimension measures the division of roles between the sexes in society. Strong masculinity scores characterises societies that maximise the social sex role division. In a masculine society, masculine goals such as opportunities for promotions and high earnings in work are emphasised. Feminine societies value good interpersonal relationships and service to others. Although the degree of masculinity or femininity in a country is very

important for the self-concept of its citizens, differences in this dimension are less relevant to the way project management works (Hofstede, 1983).

Hoftstede's (1980, 1983) work provides a basis for understanding the general nature of the behavioral patterns of various nationalities. The impact of culture on the JV organisation is implicit and it manifests its presence through conflict whenever there is a clash of cultures. Many researchers (Reynolds, 1978; Tung, 1984; Peterson and Shimada, 1978) extensively studied the influence of culture on the success and failure of Japanese American JVs. Peterson and Shimada (1978) concluded that much of the instability of U.S.-Japanese JVs was a result of the inability of the Japanese and American managers to understand the cultural basis of each other's management perspective. These researchers observed the presence of cultural differences only through observable differences in institutional arrangements, management philosophies, managerial systems and management practices. Franko (1971) confirmed these observations when he tried and failed to establish a direct link between JV performance and cultural differences.

MEASURES OF JOINT VENTURE PERFORMANCE

Awadzi (1987) highlighted three problem areas associated with the measurement of JV performance. Firstly there is no general consensus on the definition of JV performance. Secondly, the researchers used different terms to refer to JV performance. Dang (1977), Renforth and Raveed (1980), Beamish 1984),Awadzi (1987) and Tillman (1990) used the term "performance" while Killing (1983), Schaan (1983), Lacraw(1984) and Chowdhury used the terms "success" and "failure" to refer to JV performance. Franko(1971) and

Raveed (1980) used the term "survival" to refer to JV performance. Thirdly the measures used for measuring JV performance also varied significantly among the researchers. These measures are classified into three categories. Some researchers like Dang (1977) and Renforth and Raveed (1980) used financial measures to evaluate JV performance. Some of the financial data studied included a) return on sales; b) return on assets; c) sales growth; and d) productivity improvements etc. Despite the usage of a large number of financial ratios, these researchers could not differentiate between good and bad performance. Killing (1983) also warned against using financial ratios to compare and rank various JVs, since the policies and accounting standards used in preparing the financial data by the individual firms may be significantly different.

Researchers like Lacraw (1984), Awadzi (1987) and Tillman (1990) used a combination of financial and non-financial measures to judge a JV's performance. Lacraw (1984) measured success of JV through measuring the profitability of JV and the performance of JV as rated by the foreign partner. Awadzi (1987) devised a composite performance index that included both financial and non-financial measures. He used the non-financial measures such as meeting partners' objectives to measure internal performance and used the performance index to compare the JV's performance with that of the industry in which it operates. Tillman (1990) used the same criteria applied by Lacraw and Awadzi to measure the performance of Japanese-Thai JVs.

The third category of researchers use subjective criteria to measure the performance of JVs. Franko (1971) tried to use the concept of survival to define JV performance. He associated poor performance with the change in the ratio of equity contributions of the

partners over the life of the JV. A JV is considered unstable if one of the partners a) significantly increased its share of equity; b) significantly reduced its share of equity; or c) completely exited from the JV. Killing (1983) asked the JV managers to rate the performance of the JV based on their judgements. He considered a JV to be successful even if only one partner was satisfied. Schaan (1983) imposed a much stricter criteria for measuring success and defined JV success as the ability of the JV to meet the expectations of all partners at the same time. Beamish (1984) agreed with Schaan's (1983) assessment of JV performance. He considered the JV as a failure if one partner considers the final outcome from the JV did not meet its original objectives.

The review of literature reveals the difficulties in defining and measuring JV performance. Schaan (1983) identified three problem areas related to defining and measuring JV performance. First, the partners of the JV choose specific criteria suited to their own particular JV. The criteria used by one local partner differs from another. There are also differences from one foreign partner to another. Second, there is no standard definition available or used to define the specific criteria applied. Third, the assessment criteria used by the partners changed over the life cycle of the JV.

This study uses the subjective measures for JV performance recommended by Beamish (1984), Killing (1982) and Schaan (1983). For the purpose of this study, satisfactory JV performance is recognised if one of the partners considers that he has achieved his primary objectives. The reasons for choosing this approach is explained in the next chapter on Research Method.

FINAL NOTE ON LITERATURE REVIEW

It is evident from the literature review that the factors that influence JV performance can be divided into two groups. Geringer (1987) identified the two groups as task related and partner related factors. In his study of these factors, Geringer found that JV partners focused mainly on task-related factors and largely pushed partner-related factors to the background. However, he found that partner related factors such as compatible goals, commitment and trust, cooperation or conflict, national and corporate culture had a much more significant influence on the performance of a JV than task related factors such as local government influence/persuasion, market access and the need for the other partner's resources. He observed that lack of significant research on partner related factors has made many researchers to conclude that the high rate of failure of JV is a natural phenomenon. He also concluded that only longitudinal studies of joint ventures from feasibility stage to termination stage can provide meaningful conclusions about the level of influence of various partner related factors on JV performance.

The current researcher has noted that very few studies on JV has attempted to take this approach. Majority of the research reviewed relied on various statistical techniques to establish a correlation between the factors chosen as independent variable and the JV performance, the dependent variable (Harrigan (1984, 1986), Awadzi, (1987).). None of the researchers studied the relationship between the various factors identified in this review and JV performance concurrently. Hyder (1989) was the only known researcher to have used the case study approach to study the performance of three JVs formed between three Swedish firms with partners in the Indian sub-continent.

The current research, to the best of the knowledge of the researcher, will be the first attempt to study the relationship between the various factors identified in this literature review and their influence on JV performance in the construction industry using a case-study approach. The study may also enable the researcher to establish whether the factors identified to influence the performance of JVs in the manufacturing and services industries are equally applicable to the construction industry.

CHAPTER 3

RESEARCH MODEL, HYPOTHESES AND METHODOLOGY

RESEARCH MODEL

Based on the review of the literature in the previous chapter, a research model is presented in this section (Figure 3.1). The relationships depicted in the model form the basis of the research hypotheses to be developed in the next section. The model is an attempt to explain the dynamic nature of JVs.

Outline of the Model

Partners' Objectives

From the foreign firm's perspective,a JV is not the preferred option to enter a new market as it involves dilution of its control and the potential dissipation of knowledge advantage to its competitors. A search of the literature reveals that host government regulations and attitudes often leave little choice for the foreign firm but to form a JV with a local firm if it is interested in entering the local market. The foreign firm is also motivated to form a JV even without the insistence of the host government if the size of the project is too large for the foreign firm to carry all the resultant risks all on its own or the project requires skills and technology beyond its capabilities.

The local partner, on the other hand, usually enters a JV because it provides access to technology which it would otherwise be difficult to develop on its own. Transfer of technology probably constitutes the single most important reason why local firms seek JVs with foreign firms (Dutta, 1988). Another motive is the ability to access large and

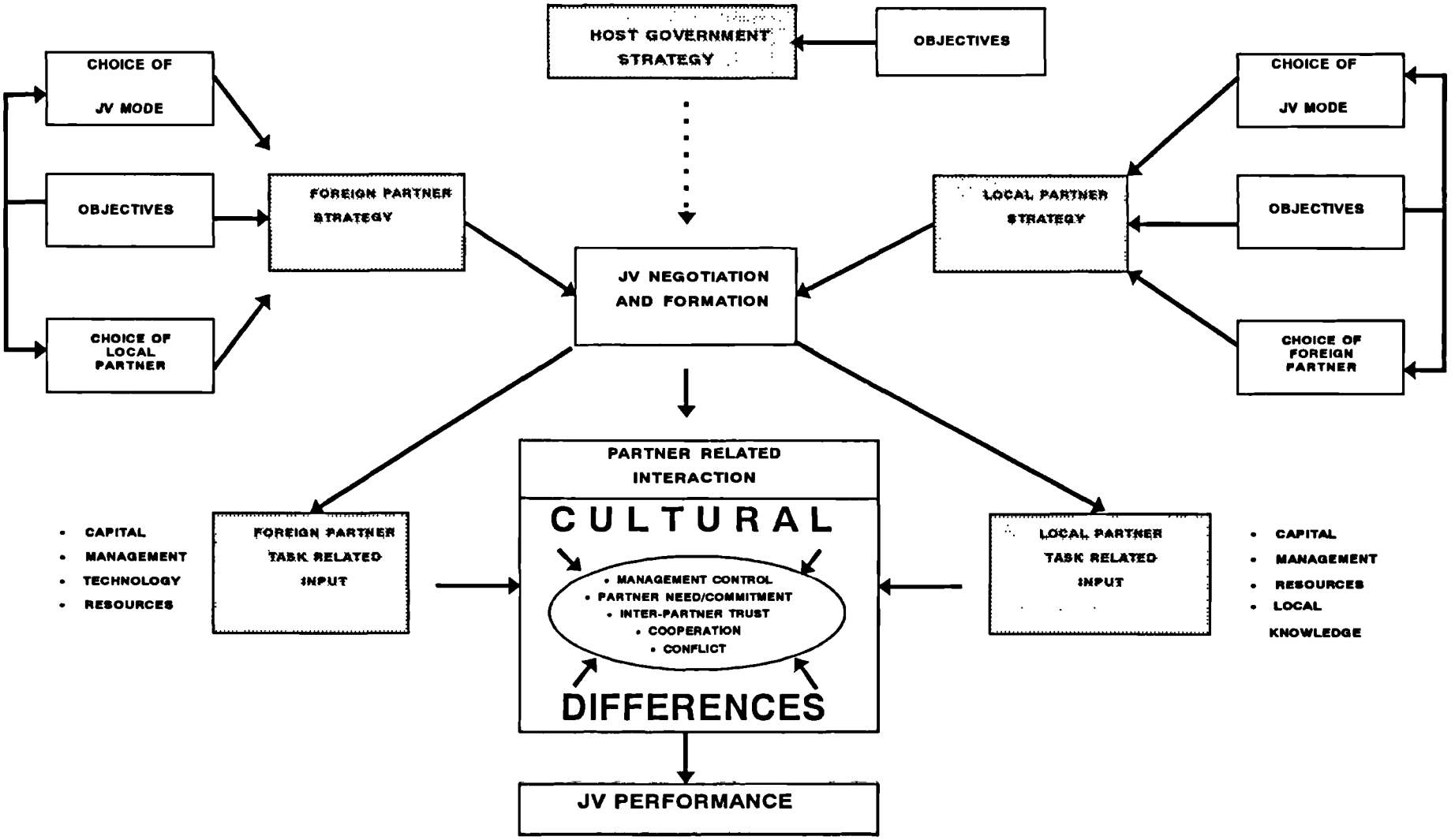

Figure 3.1 Framework for Joint Venture Analysis

sophisticated project market sector.

An analysis of the objectives for forming a JV is not complete without giving due consideration to the motives of the host government. Host governments may want JVs as a way of ensuring minimisation of foreign control of the local construction industry, enhancing the technological capabilities of local firms, increasing the level of employment of the local personnel and limiting the outflow of foreign exchange.

The three groups involved in the JV formation process (i.e. the foreign firm, local firm and the host government) often have divergent objectives. Any JV analysis will have to closely study how these divergent objectives are addressed during the JV negotiation and the formation of the conditions of the JV agreement.

Partner Selection and JV Formation

The search for a suitable partner is usually initiated by the foreign firm who is interested in entering the local market. It is also possible for the local firms to find a foreign partner to give it access to large and complex projects. The selection process adopted by the respective firms often provides clues to the potential direction the JV will take after its formation. Foreign firms that possess unique firm- specific advantages which are strongly desired by the local government and local firms, are in a position to negotiate an agreement from a position of strength. They are also presented with a wide choice of local partners. The negotiation process may involve compromises beyond what was originally intended by both partners. In a few cases, host governments may force foreign firms to

choose partners from a limited pool of local government-owned firms.

The analysis of the selection process can help to identify the selection criteria used by the partners, the bargaining power exercised by the foreign firms during negotiations and the direct or indirect influence of the host government on the partner selection process. The partner selection and JV formation processes set the basis of the relationship between the partners during the operation of the JV. This is depicted in the next stage of the model, and described in the next section.

JV Relationship

During the JV negotiation and formation stage, the potential partners spend considerable time to identify their common compatible interests in the task-related areas. Depending upon the bargaining power exercised, the level of equity and resource contributions are determined, responsibilities of each partner are allocated, and lines of formal communications between the partners and with outside parties are established.

The smooth operation of the JV after the initial honeymoon period is mainly dependent on the interaction between the partners in making strategic and operational decisions. The agreements and expectations may not develop as anticipated and this may lead to conflicts. The partner-related behaviourial and cultural factors come to the surface at this stage and over time may have a significant influence on the performance of the JV.

It is rare to find a JV that experiences minimal problems during its operational life. Many

of the problems can be traced to the cultural differences that exist at both the national and organisational level (Dutta, 1988). Cultural differences can often lead to a breakdown of communications, create mistrust, and sometimes result in eventual dismemberment of the JV (Peterson and Shimada, 1978). Cultural differences can also determine the development of mutual trust between the partners as well as determine the level of control the partners want to exercise over the operations of the JV. This critical problem inherent in any JV between different nationalities can only be overcome through cooperation and the will to resolve conflicts through patient negotiations. Such co-operative strategies in turn may require firms to give up some control over certain strategic considerations or activities (Harrigan, 1986).

Along with cultural issues, differences in management styles of the two partners can cause problems. It is common in developing countries to find JVs that have large MNCs partnering small local firms. In such combinations, the partners can have different perceptions of risk. The MNC may be quite willing to take on high risks and may even be prepared to incur short-term losses in order to gain a foothold in, and increase its share of the local market. The smaller local firm may fear that the potential losses may threaten the survival of the parent firm itself. There can be differences in management styles too. The smaller firm may prefer a participative style while the larger MNC may insist on an autocratic style of management. The outcome of such differences can result in conflict and non-resolution of such conflicts will eventually affect the performance of the JV.

Differences in perceptions regarding the strategic importance of the JV project can also cause problems. The commitment of each partner is a function of the importance that the

partner attaches to the project and, when such commitments differ significantly, management of the JV can be fraught with problems (Dutta, 1988).

Using this model, it is possible to show how the interactions between the partners in contribution of resources, exercising formal and informal control and cooperation/conflict over time affects the performance of the JV.

Measurement of Performance

The literature review on measuring JV performance shows no consensus among researchers on the methodology for assessing JV performance. The performance measures suggested can be grouped into three categories. Researchers like Dang (1977), Renforth and Raveed (1980) recommended using financial measures to examine performance. While this may be possible for manufacturing JVs, collecting such information from construction JVs is not feasible. Contractors are very reluctant to provide sensitive financial information on a project by project basis. Even if such information is available, the information provided may be misleading because of adjustments made, for tax, political and strategic reasons. Furthermore the JV may not have been formed with the primary objective of earning a profit. Hence the financial measures are found inappropriate for measuring the performance of construction JVs.

Franko (1971) recommended measuring the performance of a JV using stability as the criteria. A JV is considered successful if the equity mix remained unchanged and the partners continued their association for a number of years. This type of measurement has

its limitations. First, the JVs may continue in business despite severe difficulties because of the prohibitive cost of breakup. Second, some JVs may have been designed to terminate after certain objectives have been met. Third, one of the partners may decide to withdraw from the JV for other strategic reasons. This measure is not appropriate for measuring the performance of construction JVs as many JVs in this industry are formed to satisfy short-term objectives and designed to dissolve at the end of achieving that objectives.

Some researchers (Lacraw, 1984; Awadzi, 1987; Tilman, 1990) used multiple measures to measure JV performance. They used a combination of financial and non-financial measures. Lacraw (1944) used three measures of success: management assessment of success; financial success, and industry-correlated success rate. Artisian and Buckley (1983) used four measures of success: profitability, growth, export performance, and fulfilment of expectations. The main difficulty in using such measures for measuring the performance of construction JVs is the generally short life span of construction JVs compared to that of manufacturing JVs for which these composite measures were suggested.

Other researchers such as Killing (1982), Schaan (1983), Beamish (1984; 1988) have used subjective measures to assess the performance of JVs. They mainly considered the level of overall satisfaction of the parents with the JV as a measure of JV performance. Their arguments in support of this approach is that the JV partners, at the time of formation of the JV, have specific expectations and the realisation of those objectives or expectations can be used to measure the performance of the JV.

This study is in favour of using this method although the partners are asked to make subjective assessment of overall performance. For the purpose of this research study, JV's performance is defined in terms of realisation of primary objectives or expectations of the partners to a JV arrangement. In this study, both the partners were required to identify their key initial objectives for forming the JV. They were then asked to rate the level of achievement of those objectives on a scale of 1 to 7 (1 representing least satisfaction and 7 representing most satisfaction). Based on the scores for each objective, they were then asked to give an overall rating of JV performance. A score below 3.5 is considered as the partner's inability to achieve its objectives indicating unsatisfactory JV performance. A score above 3.5 is considered as satisfactory performance.

During the interview process, the present researcher found that only the local partners were willing to assess their respective JV's performance. Some of the former employees of the foreign firms, who provided other data for this research, were unwilling to assess the JV's performance on behalf of their former employers. This research study hence considers that the JV is successful if the local partner is generally satisfied with the overall outcome of his JV association. In order to minimise any possible bias in the assessments made by the local partner on JV performance, the researcher sought the help of the Project Manager of MRT, who supervised all the JVs' works on behalf the client, to provide his independent assessment of the JVs' performances. This method of independent verification has not been previously used in other researchers' work reviewed by this researcher.

HYPOTHESES

The hypotheses proposed in this section are based on the literature review and the research model depicted in Fig 3.1 and described in the previous section. They depict the possible relationship between JV performance and various factors that may influence the performance of the JV. The hypotheses are presented in the same order they appear in the research model. All hypotheses are considered equally important for this research.

Hypothesis 1

JV's performance is enhanced when the partners work together to achieve their mutual compatible objectives.

This hypothesis is based on the research findings of Tomlinson (1970), Reynolds (1984), Tung (1984) and Simiar (1982) who all found that success of a JV depends on the compatibility of parents' goals.

In general, goals of parents represent the benefits they expect to derive from the JV. Achievements of those goals is expected to enhance the performance of a JV.

Hypothesis 2

The performance of the JV is enhanced when partners are selected to provide complimentary resources and skills.

This hypothesis is in line with the research findings of Geringer (1986) and Beamish (1988). Their research work on JVs formed in both developed and developing countries

indicate the need for compatible objectives and complementarity of resources between partners as pre-requisites for JV success and stability.

One of the major reasons for the formation of JVs is for firms to pool resources. It is natural to expect the JVs to succeed when the partners make available resources or skills that the other partners do not have or possess.

Hypothesis 3

The performance of the JV is better when the partners forming the JV have had a favourable past association.

Tomlinson (1970) found that previous successful association between partners enabled the partners to understand each other's needs and contribute to a positive working relationship, thereby increasing the chances of the survival of the JV. Geringer (1987) confirmed this in his research on JV partner selection.

Hypothesis 4

The performance of the JV in which one partner holds dominant equity share would be better than that of a JV in which both partners equally share the ownership.

This hypothesis is derived from the research findings of Killing (1982), Schaan (1983), Lacraw (1984) and Awadzi (1987) who have all found that good JV performance is achieved when one partners holds a dominant share in the JV. They also noted that equal partnership resulted in poor performance.

Hypothesis 5

The performance of the JV is enhanced when only one partner exercises management control over the operation of the JV.

This hypothesis is based on the findings of Freidman and Kolmanoff (1961), Killing (1982) and Schaan (1983). They found positive relationship between good JV performance and one partner control of JV operations. It has to be noted here that other researchers such as Tomlinson (1970) and Beamish (1984) have a found a negative relationship between dominant management by the foreign partner and JV performance. The present researcher is keen to find out whose findings the current research will support.

Hypothesis 6

The performance of the JV increases when the JV partners trust each other, have mutual need and commitment and are willing to cooperate.

Beamish and Lane (1983) and Beamish (1988) established that inter-partner trust, mutual need and commitment and the desire to cooperate are all essential pre-requisites for successful JV operation.

Hypothesis 7

The performance of the JV is adversely affected when the level of conflict between partners increases.

Killing (1982), Simiar (1983) and Awadzi (1987) have all noted that conflict has a negative influence on JV performance. Conflict if left unresolved can lead to the dissolution of the JV itself.

Hypothesis 8

JVs formed between partners with similar cultural attributes are likely to perform better than JVs formed between partners coming from diverse cultural backgrounds.

Hofstede (1983) observed that each nationality has its own unique culture. Cultural differences are bound to surface when partners from different nationalities join together to perform a single or group of tasks. Unless serious efforts are made to overcome the differences in the interest of group harmony by both the partners, cultural differences would result in irreconcilable conflict and significantly impair the normal operations of the JV.

RESEARCH METHOD

This section describes the research method used in this research study. It is presented in three parts. The first part describes the choice of research method. The second part explains the reasons for selecting the subject matter for detailed study and analysis and the third part describes the data collection process.

Choice of Research Method

The majority of research studies on JVs reviewed by the current researcher relied on statistical techniques to derive a correlation between the dependent variable, performance of the JV and specific independent variables (Harrigan, 1986; Geringer, 1987; Awadzi, 1987; Chowdury, 1989; Tilman, 1990).

The results derived from such methods show the relationship between the two variables at a single point in time. Such methods, to a large extent, rely on quantity of information rather than quality for establishing a relationship between the dependent and independent variables. Geringer (1987) who used several univariate and multivariate statistical techniques in his research on criteria for partner selection, lists a number of potential bias that can creep into the sample data. Some of them are: sample composition; interviewer bias; recording of data; statistical conclusion validity; and interpretation of results. In his recommendation for future research on JVs, Geringer (1987) suggests:

> "A potentially interesting study would be for a researcher to use a longitudinal field study design to examine one or, better yet, several proposed joint ventures from their initial study through formation...A longitudinal study could be a particularly suitable methodology for accomplishing that end, due to its potentially greater ability for capturing the dynamic, as well as the static, element of interrelationships between partners" (p 524)

The current researcher agrees with Geringer's (1987) recommendation that a meaningful study of JV performance can only be carried out through intense study of the interactions between partners. A case study approach is most suitable to achieve this objective. Bennet (1984) defines "case study" as a fairly intensive examination of a single unit, such as a person, a small group of people or indeed a single company. Case studies involve measuring and studying what is there and how it got there. They can enable the researcher to explore, unravel and understand problems, issues and relationships (Bennett, 1984). The case study method is preferable to other methods for the reasons discussed below.

First: the case study approach is intensive in nature. It studies a unit in its entirety. It is very helpful when one is seeking help on a problem in which interrelationships of a

number of factors are involved, and in which it is difficult to understand the individual factors without considering their relationships with each other (Rao, 1993).

Second: a case study is a description of a real event or situation, unlike other studies which may involve abstraction from real situations. As a result of the longer intimate association of the researcher and respondents, it may be possible to probe deeper into the issues that are under investigation.

Third: inferences are obtained from the study of an entire situation over a period of time. As one researcher remarked, "I can hardly think of any method more suitable than case study, in the construction of historical processes."

This method, like other research methods, is not without its limitations. The conclusions reached by these methods cannot be statistically verified. As case studies involve detailed description of complex situations, it is difficult to develop formal methods of observation and recording. Informal methods tend to become subjective rather than objective. Despite the shortcomings of this method, it is the only method that can penetrate complex issues such as human relationships, the emergence and resolutions of conflict, unexpressed feelings and expectations which require intensive observation to avoid neglect of significant details (Hyder, 1988).

The present researcher has taken enough precautions to prevent individual bias creeping into the cases presented in this research. Wherever possible, separate interviews were held with all the partners involved in the JVs studied. Their responses were cross-checked to

eliminate any biased opinions of the interviewees. The researcher had access to the archives of records of the client and a thorough search of documents were made to establish independent verification of facts presented in this research. Further verifications were sought through a search of published articles in the local newspapers and regional journals.

Case Selection

The cases presented in this research are about the international JVs formed between Singapore construction firms and foreign firms, who worked together, on the construction of the Singapore Mass Rapid Transit Project. This project was built between 1983 and 1990 at a cost of S$ 5 billion involving 38 civil contracts (The project details are presented in the next chapter). Out of these 38 civil contracts, 25 were awarded to JVs. Since the main aim of the study is to analyse the factors that affect the performance of international JVs, all JVs having only local partners or JVs consisting of only foreign firms were not considered in this study. This reduced the number of JVs available for detailed analysis to 16.

All the firms involved in the case study projects worked for the same client, the Mass Rapid Transit Corporation of Singapore. They all worked to the same General Conditions of Contract and the work was carried out in the same city. Most of the construction work by these contractors took place around the same time, between 1984 and 1989. The host Government, Singapore did not impose any restrictions on the foreign contractors to work in Singapore. The foreign contractors were free to bid for the project on their own merit

and there was no direct pressure from the host government to take local firms as partners. The government of Singapore only encouraged the foreigners to form JVs with local partners through certain incentive schemes.(These are discussed in the next chapter.) Perhaps the unique feature of this project is the diversity of nationalities of the foreign firms who successfully tendered for the various contracts as JVs with local partners. This provided an unique opportunity to study the JVs in groups instead of individual cases. From the available number of JVs it was possible to divide the JVs into European-Singapore JVs, Japanese-Singapore JVs and Newly Industrialised Countries (NICs)-Singaporean JVs. Such grouping also enabled the researcher to minimise the impact of individual biases. More importantly it became possible to study the influence of culture on JV performance in a meaningful fashion. To the best of the knowledge of the researcher, no such study has been undertaken by any previous research.

Data Collection

The present researcher worked as part of the management team of the client between 1985 and 1990, on the case study project and has had direct exposure to the issues discussed in this research. The senior management staff of the contractors and the client, who have all contributed to this research, have worked with this researcher in the case study project before this research was undertaken. This made the data collection process relatively simple.

The present researcher started the data collection process by spending nearly six months at the MRT archives to build the case history of the various JVs involved in the project.

The senior management of MRT were kind enough to allow the researcher to copy documents, that were not of confidential in nature, for future use in the research. This process continued along with literature review. A further source of information available to the researcher were the articles published in the local and regional newspapers and journals. Since this was the largest project ever built in Singapore, the National University of Singapore Library separately catalogued all the articles. These sources enabled the researcher to gather sufficient background information on the project before proceeding with data collection from the participants in the various JVs involved in the project.

Data specific to the present research, was collected through face to face interviews with the senior management and board members of the local and foreign contractors where ever possible. Some of the foreign contractors had left Singapore and in such cases attempts were made to reach their head offices through telephone and fax. Because of the researcher's close association with fellow construction professionals, he was able to trace and interview a few of the former project managers and senior staff who chose to stay and work in Singapore for other firms even though their former employers left Singapore at the completion of the case study project. The interviews were semi-structured and the interviewees were encouraged to talk freely. In order not to waste time during the interview, the researcher reached every interviewee by phone and explained to them the objectives of the research before fixing the time for the interview. This was followed by mailing a questionnaire to the interviewees so they could have an idea of what was required from them. The actual interviews took place approximately two weeks later. This practice differed from the normal practice of mailing survey forms to as many potential

respondents as possible and hoping to get a reasonable percentage of replies. In this case study, questionnaires were sent out only after the candidate identified for the interview, confirmed that he would participate in the interview. The questionnaire was used as the agenda for the meeting and the discussions with the interviewees centred on the issues raised in the questionnaire. In most cases, the reply to the questionnaire was handed over to the researcher at the end of the meeting. In a few cases, a second and even third meetings were held to seek clarifications and better understanding of the issues discussed in the first meeting. A total of 38 interviews were carried out each lasting nearly two to three hours.

The questionnaire (Presented in Appendix A) used in this research consisted of seven sections. The first section sought general information about the joint venture and about the person who was interviewed. The second section tried to identify the key objectives of the firm. The third section addressed a series of issues related to partner selection. Questions raised in this section were also designed to address the issues of partner need and commitment to the JV. The fourth section dealt with questions related to JV control. This was divided into three parts. The first part was regarding equity contributions. The second part addressed the issues related to resources contribution by each partner and the third part dealt with management control. The fifth section dealt with mutual contribution of resources by the partners to the JV. The sixth section addressed the issue of conflict. Questions were raised to determine the intensity level and types of conflict. The interviewee was also asked to identify conflicts that can be attributed to cultural differences. The seventh and last section dealt with measurement of JV performance.

Presentation of Results

The results from the data collection are presented in the form of case studies in the next four chapters. Chapter 4 provides a short history of the MRT project. In Chapter 5, the interaction between European and Singaporean partners and the resultant outcome are presented. In Chapter 6, interaction between Japanese and Singaporean partners and their JVs' performance are presented. In Chapter 7, the behaviour of contractors from NIC and Singaporean contractors and the resultant outcome are presented. In Chapter 8 the reasons for the possible differences in performance of JVs formed with the European, Japanese and NIC contractors are analysed and the hypotheses presented in this chapter are tested. In Chapter 9 a list of recommendations for practitioners, academics and future researchers on JVs are presented.

CHAPTER 4

CASE STUDY PROJECT

SINGAPORE MASS RAPID TRANSIT SYSTEM

INTRODUCTION[1]

In 1967, a team of experts from the United Nations Development Program and the City Planning Department began to assess land use and transportation needs of Singapore as part of the overall development policies being formulated by the newly independent Government of Singapore. The four year study forecast the need for a rail transit system by 1992 and predicted that it would not only be environmentally unacceptable but physically impossible to build all the roads demanded by the unchecked growth of private automobiles.

The Government decided to conduct a three-phase Mass Transit Study(MTS) between 1972 and 1980 in order to further evaluate the issues raised in the previous study. The first phase (MTS Phase I) evaluated the cost and benefits of five alternate mass transit systems including an all bus system. The study team recommended that Singapore's overall objective would be best served by a rail-based system combined with a complementary bus network. MTS Phase II confirmed that a rail system operating through the most densely populated areas would be economically and technically feasible. Further investigations were carried out in MTS Phase III. This study identified the station locations and established a preliminary budget for building and operating the system. The government simultaneously engaged an independent team of academics from Harvard University to review the assumptions made in the previous study.

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[1] Many of the technical details presented in this chapter are derived from the paper written by Hulme, Chapman and Pok entitled, " Singapore Mass Transit System: Planning and Implementation." This paper was published in the Proceedings of the Institution of Civil Engineers, Part 1, August,1989, 86, pp. 627-665.

The Harvard team rejected the rail alternative and instead recommended an all-bus network. This prompted the Government to conduct a Comprehensive Traffic study of "rail versus bus" in 1981. This study confirmed that the rail system was crucial to the Republic's anticipated transportation needs and an all-bus system would impose severe restrictions on other road users.

The government gave the green light to build the project in May 1982 and established a budget of S$ 5 billion and set a deadline of 1992 for completion. A new government statutory board named Mass Transit Corporation was established with full authority to implement the approved plan.

THE ROUTE

By the time the decision to construct the MRT system was taken, the land along the route of the system was relatively well developed and the centre of the city was very heavily populated with commercial and financial centres. The idea of building an all-viaduct system through the business and commercial centres of Singapore was not acceptable due to environmental reasons and the uneconomical usage of scarce and valuable land by stations and viaduct supports. With these factors in mind, the planners of the system decided to build the railway underground throughout the central area, emerging above ground at the earliest opportunity.

Outside the central area, the line was based on the "string of pearls" philosophy, linking

the various new towns and industrial park developments. Many of the stations in the outer areas were located in the new town centres with convenient bus interchange facilities to widen the catchment area. The final shape of the system assumed that of an inverted "T" (Figure 4.1).

The system is 67 kilometres long with 20 kilometres built underground and the balance built at grade or above ground level. There are forty-two stations in the system, fifteen of them built underground. Nine of these stations are also built to serve as defence shelters in case of national emergencies. The railway is served by one main depot in the north-south line and by two sidings for overnight storage with minor repair facilities near the east and west ends of the railway.

IMPLEMENTATION

Staged Construction and Opening

The master plan divided the construction of the railway into five phases. The first phase of the system encompassed Bishan depot and joined the new town of Ang Mo Kio to the central business district. Outram Park Station, where permanent reversing facilities were required, conveniently formed the terminal station for this phase. The north-south and east-west lines were constructed between City-Hall and Raffles Place stations. The next phase, namely Phase 1A, was to quickly follow to enable the commuter flow from north to the industrial town of Jurong in the west.

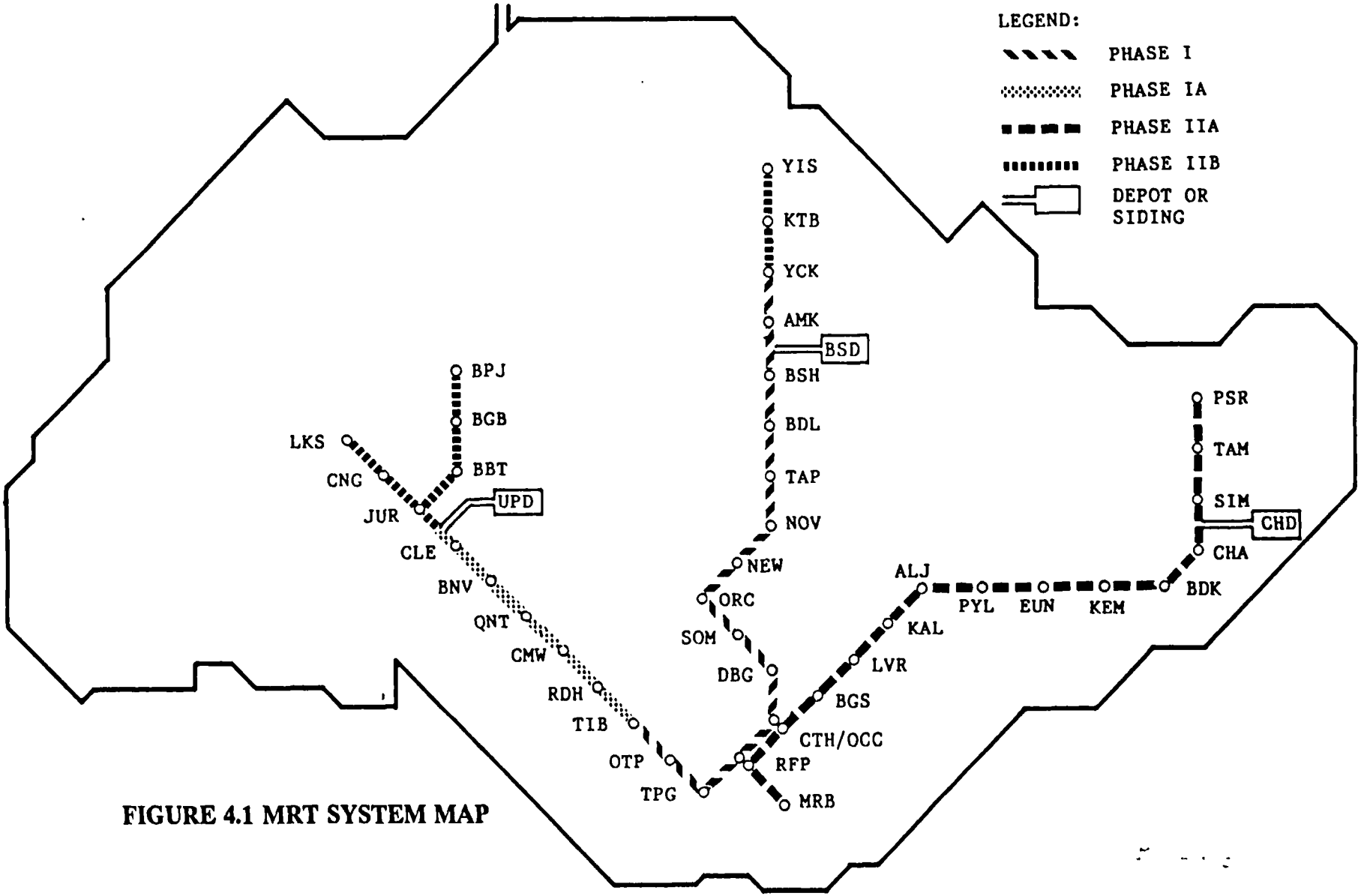

FIGURE 4.1 MRT SYSTEM MAP

The original plan called for the construction of Phase 2 after the completion of Phase 1. Encouraged by the very competitive nature of the bidding by international contractors for Phases 1 and 1A, the government decided to advance the construction of Phase 2 in 1985. This phase was sub-divided into three Phases namely, Phase 2A,2B,and 2C. Phase 2A comprised the completion of the southern extension of the north-south line to Marina Bay and the completion of the eastern arm of the east-west line to Pasir Ris , with provision for extension to Changi Airport. Changi sub-depot was included as part of this line. Phase 2B comprised the extension of the east-west line to Lakeside, with a branch line to Choa Chu Kang from Jurong and the northern termination of the north-south line to Yishun. Phase 2C is the final extension of east-west line to Boon Lay from Lakeside.

The entire construction of the railway was completed by July 1990, a full two years ahead of the originally programmed completion date of 1992.

Construction Methods Used

Nearly one-third of the system had to be built underground. The tunnels were built using both bored tunnelling and cut-and-cover methods to take into consideration the geologically variable nature of the Singapore soil. Bored tunnelling, the least disruptive to roads and traffic, includes anything from shovels and picks to state-of-the-art shields designed for use in a particular type of soil. Whenever possible, a shield was used to directly carve into the face of the tunnel.The shield jacked itself forward on powerful hydraulic rams and passed debris back through conveyor belts. As the work progressed, precast concrete segments were placed behind.

Where high water tables and soft ground conditions were met along the way of the shield machine, compressed air was used or the ground treated. In Phase 1, very difficult ground conditions were encountered in the busy central business district. Jet grouting was extensively used to stabilise soil along the busy Robinson Road. Up to 5000 holes were drilled to inject a mixture of cement and water under extremely high pressure to solidify the oozing soft clay.

Where the ground was obstruction free, the cut-and-cover method of tunnelling was used. This method involved digging a trench, constructing the tunnel within and recovering the surface. Diaphragm walls were built to limit the settlement of nearby structures and to support sides. In more stable areas soldier pile walls were used. All the underground stations were built using this method.

The crossing of the Singapore river was also undertaken using the cut-and-cover method. The work was divided into two stages so that the flow of the river was not disrupted. Using a double sheet-pile wall cofferdam to hold back the river, sections of the bed were transformed to dry land. After the tunnel was dug and the structure laid in the trench, a solid metre of concrete was poured to seal and protect it from the river above.

The elevated viaducts were built along some of the Singapore's most congested roads. In order to avoid disrupting the traffic, precast concrete beams weighing up to 165 tons were raised from the casting yard by cranes and transported by a gantry along the already constructed parts of the viaduct, and were dropped into place on pre-positioned cross heads. Up to 56 beams a month were launched without affecting the traffic below.

While describing a construction of a project of this size, a listing of some of the statistics is irresistible. To build the MRT, 4.2 million cubic metres of earth were removed. Nearly 2.2 million cubic metres of concrete were poured and 500,000 tons of steel were used. At the peak of the project, work progressed at the rate of nearly 2.5 million man hours a month- a figure that translates into 15000 workers.

When the first section of the railway was opened, the Chairman of MRTC, Mr. Michael Fam observed,"It was a tremendous physical effort on the part of those who built this system to turn every noisy pit into a beautiful station, every underground passage into a solid tunnel and every overhead beam into a functional viaduct."

CONTRACTUAL ASPECTS

Contract Arrangements

When the Singapore government approved the construction of the project, the Corporation wanted the earliest possible start of the revenue service compatible with a technologically advanced and aesthetically pleasing railway system. The prospect of a turnkey contract for the whole project was initially considered. This idea was not further pursued as such an arrangement would have put the corporation at the mercy of a single contractor. Moreover such an arrangement need not have resulted in reduced price or reduction in project duration.

The corporation instead chose a multi-contract arrangement. The corporation awarded 15 contracts to construct Phase 1 of the project consisting of 14 kms of tunnels,six kms of viaduct, fourteen stations (11 underground, one at grade and two above ground)and the main depot at Bishan. Five contracts were awarded in Phase 1A to build 1.5 kms of tunnels and 7.5 kms of viaduct, six stations (one underground and five above ground). and an earthworks contract at Ulu Pandan depot. Phase 2A and 2B comprised 19 overhead and three underground stations. Fourteen Phase 2 civil engineering contracts were awarded to build these two phases of work, one of which was an advanced earthworks contract at Changi Depot. The track works contract was awarded on a system wide basis to cover nearly 200 kms of track works in the railway.

The Government was quick to recognise that the Singapore contractors possessed neither the specialist expertise nor adequate resources to undertake MRT construction works without the support of international contractors. Few major tunnels were driven in Singapore till that time and the varying ground conditions was also of particular concern to the corporation. The need to attract qualified overseas contractors was considered as critical by the corporation for the successful execution of the project.

Fortunately, the construction industry in South-East Asia was in recession in 1983 and the decision to proceed with the early award of construction contracts provided a great opportunity to get very competitive prices from the international contractors, who were at that time, completing their work on the Hong Kong Mass Transit Railway.

Government Incentives

The local contractors were seriously concerned that they would be totally shut out of the lucrative MRT contracts because of their lack of experience in building a railway system. They wanted the Government to provide appropriate incentives to encourage the foreign firms to take local contractors as joint venture partners so that they can learn from their experience and bid on their own for the later phases of the project. The government up to that time was providing only a 2.5 percent preferential margin to all bids made by local-foreign joint ventures in which the local partner held at least a 51 percent share. The President of the Singapore Contractors' Association was of the opinion that this scheme was a failure as the foreign firms were reluctant to be minority shareholders in a joint venture (Straits Times, 12 Oct.,1982). The government, as a means of ensuring that the local contractors were given an equal opportunity to compete and participate, modified the preferential margin scheme (Straits Times,30 Nov, 1982). A preferential margin of up to 5 percent was offered to tenderers who could show a 50 percent local equity participation and maintain this throughout the contract period. The local participation can be provided by more than one local company. The government also increased the ceiling for the preferential margin from $2.5 million to $5 million. Such preferential treatment was not unconditional. All the JVs who specifically requested MRTC to include their tender for consideration under the preferential margin scheme were required to submit a detailed proposals of their technology transfer programme. If such tenders were successful, the proposed technology transfer programmes were incorporated into the contracts. The general conditions of contract authorised MRTC to supervise the implementation of the proposed programmes and empowered the Corporation to recover from the venture the

preferential margin given to the joint venture in the event the foreign partner reneged on his commitment. The procedure for qualifying under the preferential margin scheme is outlined in Appendix B.

Pre-qualification Of Contractors.

The invitation to pre-qualify for the first phase of the project went out in early December 1982. The rush for picking up the pre-qualification documents was unprecedented in the history of Singapore. Two hundred and seventy six documents were picked up on the first day of issue by the Corporation(Straits times, 6th Dec.1982). These brochures advised the contractors to register their interest in pre-qualification by submitting the details of their relevant experience, current technical and managerial expertise, financial standing, etc. Prospective tenderers were also advised of the preferential margin schemes, thus encouraging liaison between local and foreign contractors. As many of the contracts were to be awarded on a design and build basis, contractors seeking pre-qualification for these contracts were also required to demonstrate their design ability.

The rush to form joint ventures by various international contractors were also widely reported by the local press. Lim Kah Nam Pte.Ltd., was the first local company to form a joint venture with a Japanese partner, Aoki Corporation to tender for the MRT project.(Straits Times, 8th Dec 1982,) . Reportedly fourteen French Contractors vied for MRT deals through joint ventures.(Straits Times 23th Dec,1982,). Mr.David Howell, the then British Secretary of State for Transport visited Singapore to drum up support for the British firms bidding for the MRT contracts. He declared that the British government

would provide for the companies that were successful in bidding for the civil engineering contracts extensive credit guarantees and match whatever credit facilities were offered by other countries, (Straits Times, 6th Jan. 1983). The Canadian Prime Minister, Mr. Pierre Trudeau visited Singapore a few days after the visit of Mr.Howell and declared his unqualified support to Canadian firms bidding for the MRT project (Straits times, 8th Jan. 1983). The local newspaper Straits Times described the rush for forming joint ventures with the headlines, "Contractors play Musical Chairs: Last-Minute Rush to form joint ventures to vie for MRT." (Straits Times,18th Jan. 1983). Foreign contractors as far as from Mexico, who had never been involved in any construction work in the east, were forming joint ventures with local partners. At the final count, three hundred and seventy groups of contractors from twenty three countries had submitted applications for eleven contracts to be awarded for building the first phase of the project. (Straits Times, 21st Jan. 1983). More than one-third of these applications were from joint ventures having at least one local partner. The final list of pre-qualified firms for bidding for the MRT contracts is presented in Appendix C. It came as no surprise that nearly seventy percent of the firms that pre-qualified were joint ventures between local and foreign firms.

TENDER EVALUATION AND CONTRACT AWARD

Design and Construct Contracts

Pre-qualified tenderers were invited to attend a briefing during which tender requirements and contractors' queries were explained. The tenderers were given four months to prepare the bid. In this period they were encouraged to carry out additional soil investigations and

prepare an outline design. The bidders submitted lump sum bids along with a cost loaded activities programme. The lump sum bids were then converted to a net present value which took due account of the cash flow and eliminated any cash advantage which might have been gained by a tenderer who submitted a low, but front-end loaded tender sum. Acceptance of the design and construct tenders was deemed to be an acceptance of the contractors' design concept only. The successful contractor was required to develop his detailed design and drawings for client's approval before proceeding with actual construction. Since the architectural details of the contracts were not fully developed at the time of tender, the Corporation provided provisional sums in the tender. The tenderers were asked to quote a percentage of the architectural sub-contract as management fees to be added to the sub-contract tender sums. This provision enabled the Corporation to scrutinise and evaluate all sub-contractor documentation before the appointment by the main contractor. In several cases, the main contractor in a joint venture wanted to bid for the sub-contract works. The Corporation's agreement to accept the main contractor in the list of sub-contract tenderers was given on the understanding that financial assessment of the tenders was to be carried out solely by the Corporation. The Corporation took approximately six weeks to evaluate the tenders before awarding the contracts.

Construct Only Contracts

Bidders were given two months to submit their tenders after receiving the tender documents. The tenders were priced on the basis of bill of quantities prepared by the Corporation's design consultants who were responsible for the detailed design and preparation of contract drawings and design specifications. The quantities were variable

but the unit rates were fixed. There were no provisions for price fluctuations and this risk was carried by the contractors. The contractors were encouraged to submit alternative designs and offer corresponding reduction in tender price in addition to their tender on standard design package. Alternatives were submitted as the time period provided for bid preparation was very short.

The tenderers in both types of packages were encouraged to submit financing offers with their tenders. This was not a mandatory requirement as the Corporation had sufficient funds available to build the entire system. Several international contractors offered very attractive terms in the form of mixed credit, deferred payments and payments in mixed currencies. These were taken into account in calculating the net present value of the tender sum . Many of the design and build contracts were awarded to tenderers who submitted attractive financial packages.

Contract Awards

The tendering period for the first phase started on 28 February 1983 with the invitation to tender for the contracts covering the stretch from Toa Payoh to Novena. The first contract was won by a joint venture consisting of two Japanese contractors, Tobishima Corporation and Takenaka Group. The last contract for constructing the Boon Lay station and the viaduct from Chinese Garden Station to Boon Lay station was awarded to a joint venture consisting of a Taiwanese firm RSEA International and a Singaporean firm Hock Lian Seng Engineering Private Ltd. on 9th May 1988. During a period of little over five years, MRT Corporation awarded thirty eight major civil contracts valued at S$2.55

billion. Twenty nine of them were awarded to international joint ventures out of which twenty five went to joint ventures between Singapore and foreign firms. The full list of contracts awarded is presented in Appendix D. Figure No.4.2 shows the percentage share of the contracts won by various groups. Only three contracts were awarded to joint ventures on the basis of Preferential Margin Scheme(PMS). This was mainly due to very stiff competition among the international contractors and the resultant low bids received. The Project Manager for Civil & Structures remarked at the end of the award of Phase 1 contracts that the awarded value was nearly thirty percent lower than that of the Engineer's estimates.

MRT ORGANISATION

Figure No.4.3 shows the MRT Corporation's organisational chart of the Projects Division. This Division under the leadership of a Project Director was directly responsible for the planning, design and construction supervision, contracts administration and cost control of all MRT civil and Electrical and Mechanical works. The Project Director was assisted by two Project Managers. The Project Manager for Civil & Structures was assisted by six Construction Managers, one Chief Civil Engineer and one Chief Architect. At the peak of the project , the projects Division employed 1100 staff. The Project Director was assisted by a Planning & Programming Manager, Cost Control and Contracts Manager and a Technology Transfer Manager (MTT).

The MTT had the specific responsibility to supervise the implementation of the specific conditions of contract related to technology transfer in the contracts signed between the

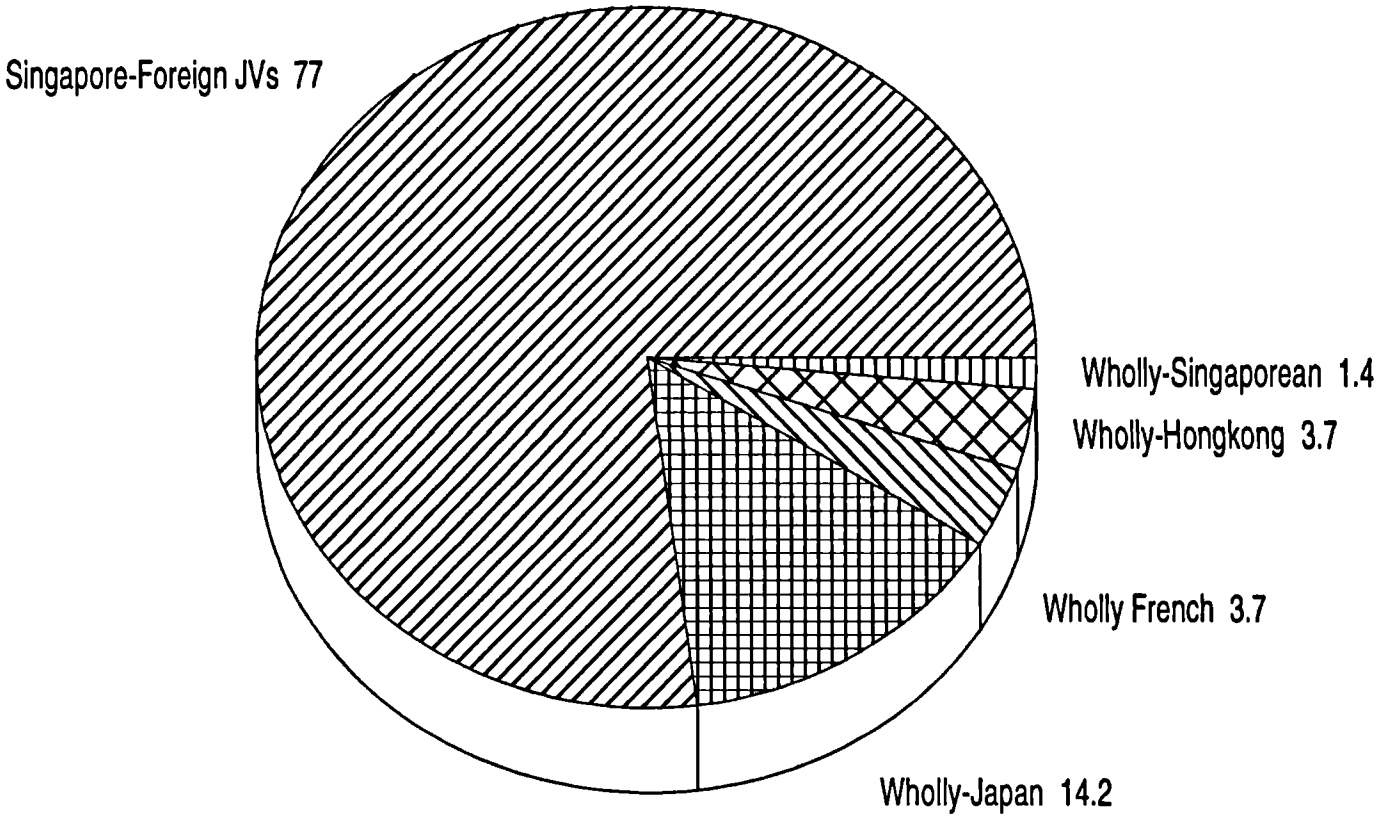

Figure 4.2 : Percentage of MRT Contracts Awarded By Nationalities

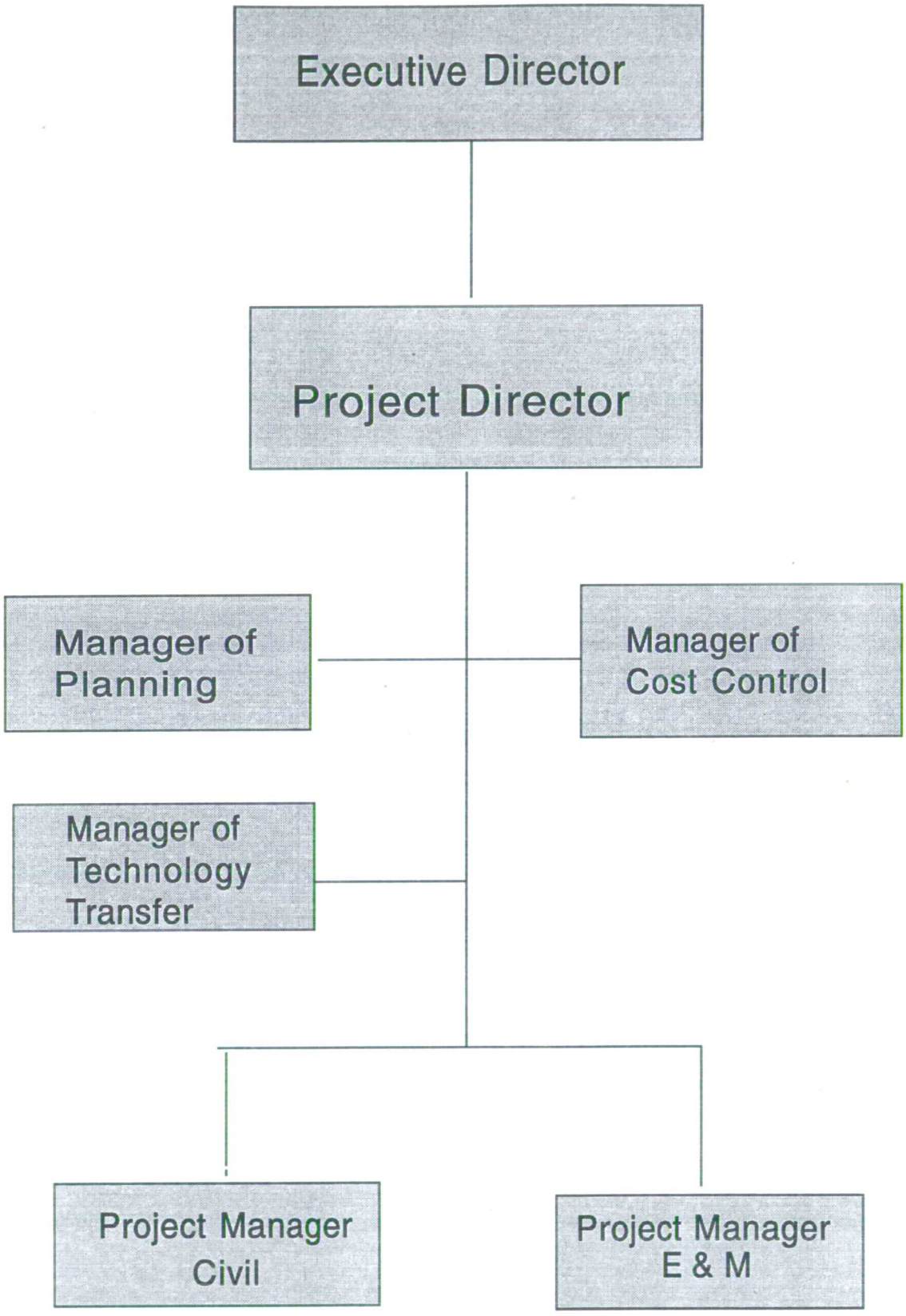

Figure 4.3: MRTC Organisation Chart

Corporation and the contractors. During the tender period the tenderers were asked to submit a detailed identification of the participation by the local joint venture partner or partners. The Corporation asked the tenderers to submit an organisation chart reflecting the following areas of responsibility:

i. Overall Project Management

ii. Design

iii. Site Management

iv. Programming

v. Budgetary Control

vi. Contract Administration

The Corporation also required the tenderer to indicate the level of staffing to be provided by the local partner together with a general indication of the nature of work of various key personnel to be deployed on the project. The proposed technology transfer programme over the life of the contract was also required. The Manager of Technology Transfer (MTT) evaluated the proposals submitted by the tenderers and his input was a key element in the selection of the successful tenderer.

He had the responsibility to submit a monthly report to MRTC Board of Directors on the performance of various contractors with respect to technology transfer. There were no special provisions in the contract to enforce the technology transfer programme proposal submitted by the successful bidder with his winning tender. However based on the recommendation submitted by the MTT, the corporation had the right to withhold the Preferential Margin given to contractors who failed to implement an effective transfer programme. The appointment of a separate manager to supervise the implementation of

technology transfer programme of various contractors indicated the importance placed by the government on this important aspect of joint venture process.

The project was successfully completed on 6th July, 1990 and is recognised in the region as one of the most successful construction projects and is serving as a model to the development of transit systems in other Asian cities. While the project itself is an unqualified success story, the performance of the various participating joint ventures varied significantly. This research examines the reasons for such variances. The next Chapter examines the performance of European-Local JVs followed by Chapters 6 and 7 in which the performance of Japanese-Local JVs and NIC-Local JVs will be analysed respectively.

CHAPTER 5

CASE STUDIES OF EUROPEAN-SINGAPOREAN JOINT VENTURES

INTRODUCTION

This chapter reports on the interactions between Singaporean and European construction contractors who formed JVs to build some sections of the transit railway for the Mass Rapid Transit Corporation (MRTC) of Singapore. The analysis is presented in the form of a case study in order to identify and fully understand the dynamic process of joint venture (JV) formation and operation and the specific factors that influence their performance. The case study starts with the background information on the partners engaged in the JV process. This is followed by an analysis of the motives for forming a JV and the selection criteria used for selecting a particular partner. This is followed by an analysis of the interaction between partners and their efforts to control the operation of the JV through their mutual contribution of resources. The impact of trust and cooperation is also studied in this section. The resultant conflict between the two partners is analysed next. The overall impact of cultural differences on various aspects of JV management is also explored. Some conclusions drawn from these analyses is presented at the end of the chapter. The reason for choosing this approach is fully explained in Chapter 3 on Research Methodology.

BACKGROUND INFORMATION

MRTC awarded a total of thirty eight major civil contracts for the construction of the 67 kilometre route. Out of these, 10 civil contracts were awarded to Singapore-European joint ventures. The list of contractors and their awarded value is presented in Table 5.1.

TABLE 5.1

LIST OF AWARDS TO SINGAPORE-EUROPEAN JOINT VENTURES

No	Name of Joint Venture	No. of contracts awarded	Life of JVs	Value of Contract ($ Million)
1	Sinbelco Construction Pte.Ltd.*	2	Dec 83 - April 87	90.9
2	Bocotra Construction Pte. Ltd.*	3	Oct 83 - Nov 87	154.3
3	Dragage Et Travaux Sembawang Shipyard Joint Venture	1	Jan 84 - June 87	43.5
4	Campenon Bernard-Singapore Piling Civil Contractors Joint Venture*	1	Oct 83 - June 87	59.6
5	Lee Kim Tah-Societee Generale D' Enterprise Joint Venture	1	Nov 85 - Sept 89	59.5
6	Henry Boot-Gammon-Singa Pte. Ltd. Joint Venture	2	Jan 85 - Dec 88	274.2
	Total	10		682.00

Legend: * - Contracts awarded on the basis of Preferential Margin

Profile of European Contractors

Sinbelco Construction (P) Ltd. was a joint venture formed between two Belgian contractors and a Singaporean firm which itself was a joint venture comprising five Singaporean firms. The two Belgian firms involved in the joint venture were Companie d'Enterprise CFE and S.A. Franki NV. Both were listed as two of the top three contracting firms in Belgium in 1987 with an annual turnover of $600 million and $480 million (Spencer Chapman, 1991). The Singapore MRT contracts were the first contracts they had won in South East Asia and set up their office in Singapore in late 1982.

Bocotra Construction (P) Ltd . was a joint venture between Italian, French, American and Singaporean companies. The Italian firm in the joint venture was Cogefar Construzioni Genarali SpA (Cogefar). They had an annual turnover of $900 million in 1987 and was rated the second largest among the Italian contractors (Spencer Chapman, 1991). Cogefar had extensive experience in rock tunnelling through Alps. The French Partner in the joint venture was Borie-Sae a subsidiary of Socie'te' Auxiliaire d'Entreprises (SAE) who was rated the second largest French contractor with an annual turnover of $10.5 billion (Spencer Chapman, 1991). SAE had extensive experience in tunnelling works on the Paris and Nice metros. Traylor Brothers Inc. was a specialist tunnelling contractor from United States with extensive experience in tunnelling under built up areas. The three companies have not worked in Singapore before the award of MRT contracts nor were they associated with each other in other parts of the world.

Dragage et Travaux was one of the top ten contractors in France with an annual turnover of S$ 1 billion (Straits Times, 23 Dec 1982). They had worked on the Hong Kong metro but had no previous experience in Singapore.

Campenon Bernard was also a French contractor with a turnover of S$ 1 billion and had extensive tunnelling experience in building the subways of Paris and Marseilles(Straits Times, 23 Dec 1982). They had no prior experience in working in Singapore.

Societie Genarale D'Enterprise(SGE) was another French contractor with an annual turnover of well over S$ 1.7 billion (Straits Times, 23 Dec 1982,) and had experience in building metros in Lyon, Caracas, Mexico, Cairo and Lagos. SGE moved to Singapore in 1981 when they were awarded a S$ 223 million contract to build 7000 units of Housing Development Board flats on a joint venture (JV) basis with their local partner on the MRT project, Lee Kim Tah (P) Ltd..

Henry Boot International was a specialist tracklaying contractor from Britain with extensive experience on tracklaying for the Hong Kong Metro Authority. They were associated with Gammon (HK) Pte. Ltd. as a joint venture partner in laying the track for all the three lines of the Hong Kong MTR system - the modified initial system, Tsuen Wan Extension and the island line. They had no prior experience in Singapore.

Profile of the Singaporean Contractors.

When MRTC outlined the requirements for pre-qualification for the MRTC contracts, many of the small firms knew that they had very little chance of pre-qualifying for the highly technical and complex underground contracts. Five small but ambitious local contractors realised this and formed a joint venture company called Hytech Builders Pte. Ltd in late 1982. Their combined annual turnover was $80 million. MRT contract No 103

was the first contract for the newly formed joint venture.

Sembawang Construction (P) Ltd. was established in early 1983 as a construction subsidiary by Sembawang Shipyard which was very keen to diversify from its traditional ship repairing work. The ship repair industry was undergoing its third straight year of slump. Sembawang shipyard recorded a thirty four percent drop in turnover in 1983 (Straits Times, 25 April, 1984) and experienced their worst loss in their operational history. MRT Contract No. 105A was their first construction work.

Indeco Consulting Engineers is a hundred percent government owned company . It decided in 1979 to enter the construction market and formed Singa Development (P) Ltd to undertake civil engineering and building works. They had undertaken a few small contracts before the award of MRT contract No. 110 to them. Their annual turnover was less than $30 million.

Ong Chew Kou Building Contractors (P) Ltd. (OCK Builders) and Lee Kim Tah (P) Ltd. were well established private firms with nearly twenty five years of experience in the construction Industry.OCK Builders was established in 1960 and Lee Kim Tah in 1971. Both had extensive experience in building high-rise flats for Housing Development Board. OCK Builders had an annual turnover of $55 million and Lee Kim Tah had an annual turnover of $90 million.

Some interesting observations can be made through a closer comparison of the two groups of contractors. The European firms were quite large in size and most of them were leaders

in the industry in their own respective countries. SGE was the only company to have had any prior experience in Singapore. Most of them had a few thousand employees and their average turnover was well over $500 million. The local firms had revenues about one tenth the size of their European counterparts and employed less than 100 technical staff. Lee Kim Tah (P) Ltd. was the only local company to have had prior experience in joint venturing with foreign partners. All the local companies were privately owned. Some of them like Sembawang Shipyard, Singa Development were government linked firms.

Previous research has pointed out that firms of different sizes forming a JV are likely to face operational difficulties. This is discussed later in the chapter.

MOTIVATIONS FOR FORMING A JOINT VENTURE

Many researchers have observed that joint ventures that have performed satisfactorily, usually have partners with compatible objectives. In order to determine the compatibility of their mutual objectives, the two groups were asked to assess on a scale of 1 to 7, the importance of each objective from a pre-prepared list. If the objective received a score of 1, it was considered least important. If it received a score of 7 it was considered as most important. The average score received by each objective was then calculated on the basis of the responses received from the respective firm. These average scores were then used to rank the objectives. These results are presented in Tables 5.2 and 5.3 respectively.

Objectives of the European Firms

The important objectives, as identified by the European firms who participated in this case study are presented below in Table 5.2. These are listed in the order of their importance to the Europeans.

Table 5.2

Key Motives of European Firms

Rank	Key motives for forming JV	Average Score
1	Government Incentives	5.3
2	Avail of Partner's Local Knowledge	5.1
3	Protect International market share	4.9
4	Match Competition	4.7
5	Enter New Market	4.5
6	Effective Resource Utilisation	4.3
7	Spread Commercial Risk	4.1

When the Singapore government announced that a five percent preferential margin would be given to joint ventures having fifty percent local participation, the European contractors were keen to take advantage of the incentives provided. Hence not surprisingly that this was considered as the most important reason for forming JV with a local partner. Most of the local contractors also felt that an association with a foreign partner was critical for securing MRT contracts and the government's incentives through preferential margin was instrumental in enticing the foreign firms to team up with them. This confirms the findings of Beamish (1984) who observed that 57 percent of joint ventures in developing

countries were formed due to host government's persuasion and legislation. In a study of 168 joint ventures in developed and least developed countries, Janger (1980) also found that about fifty percent of JVs were formed due to government incentives.

Many of the European contractors who were coming to work in Singapore for the first time needed a local partner to help them with the local rules and regulations. This was considered the second most important reason for forming the JV.

Some of the European firms initially planned to bid for the MRTC tenders on their own but soon realised that the world wide recession in the construction industry was attracting most of the major contractors to the MRT project. They particularly feared intense competition from Japanese and Korean contractors who were forming joint ventures with both Singaporean firms and firms from their own countries. Matching competitors' strategy became a necessity for some of these firms.

Contractors like Henry Boot and Compenon Bernard were completing their assignment in Hong Kong and looked to Singapore MRT projects for utilising their spare resources. The Belgian contractors were looking for new markets in order to maintain their international market share. Commercial risks were not a factor in forming a JV with a local firm. Henry Boot and SGE valued their past association and continued to bid on a joint venture basis with Gammon(HK) and Lee Kim Tah respectively.

Objectives of Local Firms

The local firms' motives for forming the JV with European firms are presented in Table 5.3. These are presented in the order of their importance to the local firms.

Table 5.3

Key Motives of Singaporean Firms

Rank	Key motives for forming JV	Average Score
1	Technology Transfer	5.5
2	Government Incentives	5.3
3	Share Commercial risk	5.1
4	Enhance local image	4.6
5	Access to new financial resources	4.4
6	Enter New Market	4.1
7	Match competition	3.7

The Singaporean contractors rated technology transfer as the primary motive for forming the joint venture. They expected the foreign partner to train them in areas of project planning, cost control, contract administration, site management and construction techniques.

Sharing commercial risks was a very important factor for many local firms and this ranked third in their calculations. They also felt that their local knowledge in sourcing materials and recommending suitable sub-contractors would be valued by the potential foreign partners. Sembawang Shipyard and Indeco Engineers were using the joint venture process as a diversification strategy. Many local contractors like Hytech and OCK

Builders wanted to boost their local image through partnering with reputed international firms.

The two groups of partners had divergent motives in the area of technology transfer and the treatment of commercial risks. These two divergent motives were causes for conflict. Their impact on the performance of the European-Local JVs are discussed further under the section on conflicts.

PARTNER SELECTION PROCESS

The two groups of partners were asked to rank the importance of various factors that made them choose a particular partner. The results are presented in Table 5.4

Table 5.4

Reasons for selecting a particular partner

Description	European	Local
	Rank	Rank
Government Link	1	N.A.
Local Knowledge	2	N.A
Size/Reputation	3	4
Construction Resources	4	5
Past Association	5	6
Plant & Equipment	6	3
Management Skills	7	2
Access to Local Materials/Supplies	8	N.A.
Technology	9	1

A review of the selection process revealed a few interesting patterns in the selection process of the two groups.

The European firms were interested in linking with small firms with good government links and sound local knowledge. They were looking for local firms who would provide them with a "local identity" which was needed for qualifying for the preferential margin scheme. They were not expecting the local partner to provide any financial or managerial resources. However they did check whether the potential local partner had access to construction labour and adequate site supervisory staff.

The local firms on the other hand were looking for foreign firms that were large in size and who had an international reputation for building transit railway systems. Many of the interviewees did not have any particular preference to the nationality of the partner. The reports in the local news paper suggested that many local firms rushed into negotiating with the first available foreign contractor who had responded to their calls for forming a joint venture in order to beat the deadline for pre-qualification. An examination of the list of pre-qualified contractors show that Sembawang Construction initially pre-qualified with George Wimpey of Britain and Keppel Shipyard pre-qualified with Henry Boot for contract 101. Singa Development associated itself initially with BES Engineering of Korea on contract 102 and OCK builders partnered Mancini Construction of Italy on contract 104. The Straits times (Jan 18, 1983) referred to this frantic search among foreign and local contractors as a "game of musical chairs". The article observed that European contractors were particularly aggressive in seeking local partners and as much as six joint ventures were announced on the last day of submission of pre-qualification documents.

This clearly shows that most of the European-Local joint ventures were "marriages of convenience" and had no real commitment. Some of the local contractors when they found out that they were not awarded the early contracts immediately aligned themselves with other available foreign contractors. This was clearly the case with OCK Builders and Singa Developments. The partner selection process indicates that getting the MRT contract was the primary concern for both the groups. In other words both the groups would partner any firm that would give them a chance to pre-qualify for the MRT contracts. The above discussion clearly shows that selecting a compatible partner was not a serious consideration for both the groups.

This is contrary to many researchers' findings that the partner selection process is critical to the performance of the joint venture and sufficient time should be spent in selecting a suitable partner (Geringer (1988), Contractor (1989).

Many authors have suggested that past association as a primary motive for selecting a particular partner (Tomlinson (1970), Artisien and Buckley (1985). This was also not true in the cases examined. SGE-LKT JV was the only exception.

The literature also suggests that there is a strong relationship between motives for forming the joint venture and partner selection (Tomlinson,1970) and the motives are often complimentary. This aspect is also not visible in our case study projects. As already noted, the European firms' primary objective was to find a local partner who was willing to lend a "local identity" in order to take advantage of the government incentives but would be happy to play a peripheral role in the operation of the joint venture. On the other hand,

the local partners were looking for a foreign partner who would be willing to impart technical know-how and develop and upgrade his technical and managerial skills. This fundamental difference in perception of each others' motives was ignored initially by both parties. But this proved later to be one of the major causes for failures of these JVs.

JOINT VENTURE NEGOTIATION AND FORMATION

The partner selection and negotiation process for most of the European-Local joint ventures on an average took only three months. This is very short compared to 12-18 months period experienced by Beamish (1984) in his case studies on manufacturing JVs. A review of the joint venture agreements revealed that commercial and legal issues were dominant issues addressed in the documents. For example, the joint venture agreement between Henry Boot-Gammon(HK) and Singa Development had twenty articles out of which two were devoted to the duties of project manager and site management respectively. The rest of the articles dealt with commercial, financial and administrative issues. The joint venture agreement between OCK Builders and its foreign partners revealed similar characteristics. Many of the local directors of the local firms admitted that the joint venture agreements were drafted by the lawyers of their foreign partners and vetted by their own lawyers. Andrews (1965) recommended that organisational and management issues should be resolved before financial legal commitments were made. Many of the European - Singaporean JVs apparently have neglected to take this simple precaution. The technical and managerial aspects of the operation of the joint venture received very skimpy attention during the negotiations.

Furthermore, the joint venture agreements did not include some of the crucial objectives identified by the local partners. For example none of the documents indicated how technology transfer was going to be implemented. The local directors placed heavy trust on their foreign partners' ability to run the project smoothly and implement all necessary project controls to complete the project within the required time and cost. The joint ventures ran into difficulties when this implicit trust was lost during the operational stage of the joint venture.

Bocotra Construction (P) Ltd. was the only joint venture in this group that was incorporated as a limited liability company and was formed as a separate legal entity. The partners were expecting to continue their association beyond MRT contracts. The chairman of OCK builders, the local partner in Bocotra, proudly announced to the press, the day after the award of the first contract, that the partners of Bocotra had agreed to extend their scope of operation to whole of South East Asia. All other joint ventures were registered as partnerships with the Registrar of Companies in Singapore. Their joint venture agreements were for a specific project only and the joint venture would be dissolved at the end of the maintenance period of the MRT contract.

Apart from the legal form of the joint venture, the partners had to consider the operational arrangements. All the European-Local joint ventures used the integrated style of joint venture arrangement. In this style the parties essentially agree to perform their work as if it were performed by a single corporation. The employees of the partners work together under the supervision of one or more co-venturers in accomplishing the project objectives. All monies received from the client would go into a joint venture bank account, and the

parties would share profits and losses on a particular project in accordance with a previously agreed upon sharing ratio (Garb, 1988). The European partners preferred this arrangement over the non-integrated arrangement wherein the parties undertake their respective portions of work separately. Often this type of arrangement is entered into by co-venturers who have specialised areas of expertise or assigned work responsibilities. All monies received will be disbursed to each of the joint venturers based on the invoices they submit, and there will be minimal sharing, if any, of profits or losses(Garb, 1988). The local partners also preferred the integrated arrangement since it would provide ample opportunities for their own employees to learn from the foreign experts . Moreover the non-integrated arrangement would have forced them to take responsibility for independent work packages such as the construction of an underground station structure . They did not have sufficient experience or financial backing to assume such increased risks. For the foreign partner, the integrated style was ideal as this enabled him to have total control over the operation of the project.

CONTROL, CO-OPERATION AND TRUST

Schaan (1983) examined ten JVs in Mexico and found that partners could influence specific activities or decisions of the joint venture through the joint venture contract, appointment to the board of directors, appointment of JV managers, planning of work, administrative systems and a development of a working relationship with the partner. His research findings indicated a positive relationship between control and JV success. Hyder (1988) after studying three joint ventures between Swedish and Indian firms concluded that a partner can exercise significant control through exchange of resources. The validity

of these findings will be examined in the following sections.

Ownership Control

The distribution of the equity ownership in the European-Local joint ventures is presented in Table 5.5

Table 5.5

Distribution of Equity Ownership

Name of joint venture	Equity contribution	
	Foreign	Local
Sinbelco Construction	50	50
Bocotra Construction Pte.Ltd.	75	25
Dragage - Sembawang	68	32
Campenon-Singapore Piling JV	51	49
SGE-Lee Kim Tah JV	70	30
Henry Boot-Gammon-Singa JV	73	27

As the table indicates, most of the foreign partners preferred to hold a majority share in the joint venture. Four of them kept the local share very close to the minimum of 25 percentage required to qualify for the preferential margin scheme. Campenon Bernard and the Belgian contractors in the Sinbelco joint venture were the only ones willing to give almost equal equity control to local partners in order to take full advantage of the 5 percent preferential margin offered by the government. This happened to be the right strategy for both the companies. Campenon Bernard-Singapore Piling bid was 4 percent

higher than that of the lowest bidder. If Campenon Bernard had insisted on only a 25 percent equity contribution from their local partner they would not have been awarded the contract at all, since this would have entitled them to receive a maximum preferential margin of 2.5 percent. The same was true for Sinbelco joint venture whose bid was 3 percent higher than that of the lowest bidder. Bocotra just managed to squeeze in to get contract No. 105 by a margin of a few thousand dollars from their nearest competitor, only because of 2.5 percent preferential margin awarded to them.

It was rather surprising that the joint ventures did not consider setting up 50-50 equity joint ventures to ensure that they fully take advantage of the preferential margin scheme. Many researchers have observed that there is no significant relationship between level equity ownership and the degree of influence exerted by the parent on the joint venture(Dang (1977); Lacraw (1984)). Freidman and Beguin (1971) studying joint ventures in developing countries found that a partner can influence the activities of the joint venture without having a majority stake. Other researchers have clearly distinguished the difference between equity control and managerial control. Janger (1980) and Schaan (1983)) and have shown that managerial control is more important as an influencing factor on the performance of joint venture than ownership control. This issue is addressed in the next section.

Management Control

The European contractors tried to exercise control over the joint ventures in three areas. They are: strategic control through the joint venture board, operational control through

appointment of key managerial and technical personnel and resource control through supply and purchase of plant and equipment and materials.

Strategic Control

In the cases studied in this group, the joint venture board had total control over all the decisions made by the venture. Its board members were appointed on the basis of the equity contribution by each partner. Most of the cases observed in this group of joint ventures had four members appointed to the board with the member from the sponsoring company acting as the chairman. The board was mainly responsible for the following matters:

a. Provision of funds for the execution of the JV agreement.

b. The nature and extent of plant, equipment and materials to be provided by each party.

c. Recommendation of payment of dividends to the shareholders.

d. Accepting modifications, omissions or alterations to the conditions of joint venture agreements.

e. Entry of joint venture into new business.

f. Recommendations to the shareholders on any increase in the authorised or issued capital.

g. Approval of all key managerial appointments.

The joint venture boards normally met once a month and reviewed the progress of the project. In order to protect the interest of minority shareholders the board's decisions, in principle, were expected to be unanimous. In case unanimity could not be reached, the

Board of Directors normally adjourned for a period of 24 hours. If even after reconvening, the directors could not reach unanimity, the decision was passed, based on a majority vote. In case of a tie, the Chairman of the board was allowed to exercise a tie breaking vote if the subject matter of the decision was of an urgent and important nature.

The boards' meetings went very smoothly in the early stages. They were quite excited in getting the contracts and the key personnel and construction plant and equipment required for commencing the work were quickly approved. But as the project progressed, difference of opinions started to emerge in some of the contracts. Hytech and their Belgian partners very quickly found themselves disputing over the quality of the project manager appointed to the project. OCK Builders' relationship with Borie-Sae ran into difficulty when they demanded an active role in the management of the project. Campenon Bernard and their partners started falling out over the aggressive attitude of some of the French Engineers towards their local counterparts. Contractors like Sembawang, Singa Development decided to be passive and let their foreign partners make all the key decisions. They decided to use the JV experience mainly as a learning exercise. Only SGE-LKT, among all the European Local joint ventures, had a smooth relationship throughout the project. They attributed this to their earlier association on the Housing Board project. This supports Tomlinson's (1970) findings that past association is a very crucial factor in satisfactory functioning of the JV. The problems encountered by both the partners are discussed later in this chapter.

Operational Control

Table 5.6 shows the average contribution of each partner to the JV in percentage.

Table 5.6

Mutual contribution of resources

Description of Resource	Foreign	Local
Project Manager	100	0
Key Project personnel	90	10
Field Staff	25	75
Administration & Personnel	35	65
Plant & Equipment	75	25
Materials	65	35
Financing	90	10

As the table indicates, the European partners contributed most of the key resources required for the operation of the JV. This section discusses the impact of each resource on the performance of the JVs.

Project Manager

Beamish (1988) considers the appointment of a good general manager is most critical for the success or failure of the JV. He observed that the challenge facing the general manager was not only that the parent organisation might have different expectations but those expectations were seldom communicated clearly to the general managers. To make matters worse they also changed over time. A good project manager should give his

undivided loyalty to the JV rather than to his parent organisation. This is often very difficult to do in construction JVs since most of them exist for a single project. The bias of the project manager towards his parent organisation has often resulted as a source of conflict between the partners. All the six JVs studied in this group had expatriate Project Managers appointed by the respective European partner. Hytech Builders had a very difficult time initially with the Project Manager appointed by its Belgian partners. He was an older gentlemen who apparently treated his responsibilities in a very casual way. One of the directors of the local partner remarked that the Project Manager was more interested in planning his holidays than in the project itself! After some heated discussions at the JV board level he was replaced by a tunnel specialist who was with Franki for many years. Relationship between the two partners improved considerably after he took over the management of the project. Relationship between Bocotra's project manager and the local partner was never smooth and the General Manager of Bocotra who was a local, often had to intervene to resolve disputes. In one incident, the local partner objected to the Project Manager transferring a large amount of funds from the JV account to that of the foreign partner for payment of expenses related to relocation of expatriates from France without submitting proper records.

Such incidents created an atmosphere of mistrust which was detrimental to the performance of the JV.

Key Personnel

The organisation charts for the JVs called for key functional management positions to be

initially filled by expatriate staff to be later replaced by local staff after they received sufficient training. The Sinbelco JV were reasonably successful in achieving this objective. From the beginning local deputies were appointed to work alongside the expatriate heads of sections. The Deputy Project Manager position was assumed by the General Manager of Hytech. Towards the end of the project only two expatriates were left on the project. Hytech management were quite satisfied with the cooperation of their partner in achieving this goal . Lee Kim Tah-SGE JV did not have any problem in placing the local staff in key positions due to their earlier association.

OCK Builders had continuous problems in placing their staff in key positions. A review of correspondence reveals serious rifts between the two partners and a lack of cooperation and trust between the partners. OCK Builders wanted to place their staff in key technical positions and recommended a few candidates. These candidates were rejected by Bocotra's Project Manager. OCK was frustrated and at one stage appealed to MRTC to help them place their candidates in middle management positions. The mistrust between the two partners continued throughout the life of the JV.

The local partners in the other three joint ventures did not have sufficient local staff to second to their respective JVs. This resulted in expensive expatriate staff staying throughout the project. The General Manager of Campenon Bernard remarked that keeping their expatriate staff beyond the planned period seriously reduced their profitability.

Procurement of Other Resources

The JV board was responsible for approving any major purchases of construction plant and equipment and sourcing of expensive materials. The European partners preferred to use their own sources in their home countries for these purposes. When the mutual trust was very high between the partners this process went very smoothly. When disputes in other areas started to emerge, doubts about the motives for procuring materials from preferred sources began to surface in the board meetings. A few local contractors felt that transfer prices charged to the JV account might have been inflated by the foreign partner in order to artificially lower the profit margin affecting the share of profits for the local partner.

Another source of problem was related to the value of older assets such as plant and equipment brought to the site from other projects and shown as the partner's contribution to the equity. It was very difficult to verify the appropriate value for such items and doubts were expressed about the valuation.

Problems associated with mutual trust surfaced with regard to appointment of sub-contractors. The local contractors felt they had developed good working relationship with selected group of sub-contractors and wanted them to be appointed as sub-contractors on the JV project. Some foreign contractors feared collusion between his local partner and the recommended sub-contractor resulting in high sub-contract prices. Instead they wanted to follow the traditional method of selection through competitive bidding.

Buckley and Casson (1987) suggested that trust is a true mechanism of cooperation and trust generates loyalty. Some of the JVs in this case study seemed to be missing this important factor in their association. Some of the JV problems can also be traced to the partners' inability to differentiate between policy decisions and operational decisions. Andrews (1984) suggested that policy decisions should be taken jointly at board level and operating decisions taken at project level, within delegated limits. In most of the ventures in this group, the board members were also making operating decisions, often resulting in conflict.

CONFLICTS IN EUROPEAN-LOCAL JOINT VENTURES

Conflicts are a major source of irritation to the partners of a JV. Tillman (1990) observed that they cause partners to spend a lot of time and resource resolving disputes and disagreements. Awadzi (1987) suggested that conflict could be due to pursuit of divergent goals, interference and goal blocking and withholding of resources. Killing (1983) suggested that conflict could be caused by national cultures. These two main causes of conflict, pursuance of divergent goals and cultural differences had significant influences on the performance of the European-Local JVs. Some examples are presented in this section.

Pursuance of Divergent Goals

The European-Local JVs were presented a list of possible issues over which they could have disagreements with their partners during the formation and operation of the JVs.

They were asked to identify in a scale of 1 to 7, the level of their conflicts over these issues. A score of one indicated total agreement and a score of 7 indicated total disagreement. The list presented in Table 5.7 represents areas in which the partners had clashed frequently over the life of the joint venture (An average score of 4.0 or more).

Table 5.7

Conflicts among Partners

No	Description	Average Score
Strategic and Operational issues		
1.	Technology Transfer	5.0
2.	Interpretation of JV agreement	4.8
3.	Organisation structure	4.7
4.	Selection of Subcontractors	4.6
5.	Procurement of Materials, Plant & Equipment	4.4
Cultural Issues		
1.	Sensitivity to Partner's Needs	4.6
2.	Interaction among partners	4.4
3.	Interaction with the Client	4.3
4.	Behaviour of Expatriate Managers	4.2
5.	Language Barriers	4.1

Simkoko (1991) defined technology transfer as the planned conveyance and acquisition of technical knowledge and techniques. This implies that it is a two way process and can only succeed when both the donor and the recipient work together in deciding what needs to be transferred and implement a well organised transfer of technology programme to achieve the objectives of the program. The European partners felt that the project duration was very tight leaving them with very little time to attend to lower priority objectives such as technology transfer. Lack of long term commitment to the local partner also acted as a deterrent. The local partner during the negotiation stage spent his efforts in ensuring that his commercial interests were well protected in JV agreements. The JV agreements made no reference to the technology transfer process nor were any training budgets allotted. Effective technology transfer did take place in a few JVs where the two partners had good working relations.

MRTC appointed a separate Technology Transfer Manager (MTT) to monitor the implementation of technology transfer in all the MRT contracts. He was responsible for closely monitoring the implementation of technology transfer in the contracts that were awarded on the basis of Preferential Margin and report to the MRTC Board every month. The contracts that were awarded on the basis of PMS are Contract 103 (Sinbelco Construction Pvt.Ltd.), Contract 105 (Bocotra Construction Pvt.Ltd.) and Contract 106 (Campenon-Bernard-Singapore Piling JV). Following is the summary of reports prepared by MTT on these three joint ventures:

Sinbelco JV undertook to send their local partner's professional and technical staff for training in Belgium, both at various construction sites and as well at the main offices of

the Belgian partners. Special emphasis was to be placed on project management, site organisation and construction methods such as diaphragm walling, underpinning etc. In addition, the expatriate managers were to give in-house lectures to local technical staff during project execution time. The MTT was very positive about the Belgian Partners' efforts to share their knowledge with local staff. He was particularly pleased with the second Project manager appointed by Sinbelco who took time to talk to local junior staff and conduct regular lunch hour talk on various construction processes. This view was also shared by the management of Hytech. Hytech attributed this to one of their local directors becoming the Chairman of the JV Board and the sensitiveness shown by both CFE and Franki. A number of Hytech's senior staff went to Belgium for periods of two to three weeks. A large number of local staff were also sent to courses organised by University of London, the local Universities and professional bodies. Hytech also reported that during the second half of the project many of the expatriate managers were replaced by locals. MTT assessed in his final report that Sinbelco-Hytech JV was a successful JV as far as technology transfer was concerned.

Unfortunately the same could not be said about Bocotra. The original scope of technology transfer written into the contract was probably too ambitious. It called for the use of as many local senior staff as possible to supervise the works, to have local engineers work in France and U.S. head offices during the early stages of the works, to send local staff for a period of three to six months to learn about tunnel excavation, to provide full 18 months training for one local engineer in a French Technical Institute and to arrange for the progressive handing over of responsibility to local staff. These objectives were only partially met. Local training was considered quite adequate but no local staff were sent

abroad for any extensive period. Only one planning engineer went to Switzerland for a period of three weeks to learn computer planning techniques. The supervision of tunnel and station works remained with the expatriates through out the contract period. In response to MRTC's queries on technology transfer, Bocotra explained that the three contracts awarded to them kept them very busy and hence had to abandon some of their technology transfer objectives. MTT did recommend to MRTC Board that the technology transfer goals were not met in contract 105 and the preferential margin of S 1,770,875 given to Bocotra, being the difference between their tender sum and that of the lowest acceptable tender sum should be recovered.

According to MTT's reports, the third contract awarded on preferential margin basis, Campenon-Bernard-Singapore Piling JV started badly but soon managed to sort out their differences. The number of expatriate staff were limited to key personnel and specialists were brought in to deal with specific problems. The training was confined to the supervisory level and staff were sent to local training courses. Towards the second half of the project the Technical and administrative managers were replaced by local staff. MTT was only able to monitor the technology transfer process in the other contracts and the success or otherwise was entirely dependent on the efforts of the two partners themselves. He noted that both Sembawang Shipyard and Singa Development had very little or no civil engineering background. They had hardly any civil engineers to second to the JV nor did they appear willing to recruit any from the local market. Hence it was difficult to pass the entire blame on the foreign contractors for lack of transfer. MTT also noted that SGE-LKT JVs got along smoothly due to their past association on HDB projects and received little or no complaints from the local partner regarding technology transfer.

Cultural Issues

This research study uses the four cultural dimensions (power distance, uncertainty avoidance, masculinity, and individualism) identified by Hofstede (1980) to explain the differences among European and Singapore cultures in resolving conflict.

Hofstede's model on culture identifies the Europeans as having a small power distance (believes in equality), high on individualism (preference for individual judgement, spontaneous decisions, task before relationship and universalistic), and strong uncertainty avoidance (low tolerance, insists on rules) and highly masculine (believes in success, performance and achievement). Singapore was described as a nation that is low on individualism, has a large power distance, is more tolerant of uncertainty and is highly masculine.

Comparing the cultural orientation of the two groups, one can notice the large cultural distance between the two groups. The highly masculine nature of both the groups indicate that both groups are keen on achieving the results they want. If the two groups had the same set of objectives, all the JVs would have reported very little serious conflict. Unfortunately the two groups had different sets of agenda to pursue through the JVs. This caused considerable difficulties in the relationship between the two groups. Some of these differences are highlighted below.

The French contractors in particular were more focused on rules than relationships. They were of the opinion that the JV agreement represented a formal business document and all actions should relate to that agreement. They were quite willing to perform any task that was specified in the agreement and reluctant to accommodate any requests outside the written agreement. The local contractors placed more emphasis on personal relationships than on the wordings in the JV agreement. Even though none of the JV agreements specifically referred to technology transfer, the local partners expected their foreign partners to provide this service as part of their ongoing relationship. The foreign partners did not feel the same way. One of Bocotra's expatriate managers observed that technology transfer did not take place effectively because they were not written into the JV agreement. Bocotra's general manager who was a Singaporean observed, " In the process of technology transfer, technology is the easy part. The process of transfer from one culture to another is the difficult part."

In Eastern culture decisions are made collectively, however small they are, and joint responsibility is assumed for the outcome. In Western culture such decisions are made by individuals and they assume personal responsibility for the results. Borie-Sea, the sponsoring French partner in Bocotra considered the JV as if it was its own wholly owned subsidiary and recruited local staff for the JV without consulting their local partners. This came as a shock to the local partner who was preparing to second his own staff to the JV. He considered the behaviour of the French as selfish, high handed and domineering. On the other hand, shared decision making process helped SGE-LKT and Sinbelco Board of directors to trust each other which led to a smoother relationship between the partners.

In individual cultures(e.g., French and Italians) emotions are expressed immediately either verbally or non-verbally. In collective cultures(e.g., Singapore and Japan), emotions are not openly expressed. Asians are easily embarrassed when colleagues from a different culture exhibit public display of emotions. The employees of Singapore Piling were shocked when the first batch of French supervisors expressed their displeasure through high emotional outbursts. Some of the local staff strongly protested to their management at what they perceived as "arrogant and unruly behaviour" of their supervisors. The local partner applied strong pressure on their foreign partner and had the unsatisfactory staff sent back to France.

Some of the local partners of French companies were sometimes embarrassed by the emotional outbursts shown by their partners in meetings with the clients on such sensitive issues as claims. In private meetings with the client, some of the local firms offered their apologies for the "unruly" behaviour of their partners.

Apart from cultural problems there were a few minor issues that affected the relationship. Language barrier was one of them. For example, Compenon-Bernard had issued the manual for project management software written in French which the local planning engineer could not readily use. Some of the training classes in France were conducted in French and the local staff who were sent for training found it impossible to understand the instructors.

It was also observed that none of the European firms conducted any orientation programmes for their staff or their families relocating to Singapore. Some of the engineers who were new recruits and sent to Singapore within a few days after joining their parent firms in Europe found it difficult to adjust to local working habits and customs. This often resulted in friction between local and expatriate staff.

The cost of these cultural conflicts are not quantifiable. But they increased the strain in the relationship between the JV partners.

PERFORMANCE OF EUROPEAN-LOCAL JOINT VENTURES

Subjective Assessment of JV Performance by Local Partners

The local partners were presented a list of objectives they set for themselves when they formed the JV and were asked to indicate, on a scale of 1 to 7, the extent to which they attained their targets at the completion of the projects. A score of 1 indicated low level of attainment and score of 7 indicated very high level of attaining their objectives. The average score for each objective is presented in Table 5.8. An average of 3.5 is considered satisfactory.

Table 5.8

Assessment of Achievement of Key Objectives

No	Key Objectives	Avg. Score
1	Acquisition of New Technology	3.0
2	Improved Project/Site Management Skills	3.2
3	Effective Utilisation of Resources	2.8
4	Enhanced local image	4.0
5	Return on Investment	2.0

The results suggest that the local partners were not at all satisfied with the technology transfer process. They were ready to admit that the association with international partners improved the project management skills and taught them how to utilise the available resources. They also felt that the experience enhanced their local image and gave them confidence to venture overseas. Most of them felt that their experience left them financially poorer and would not prefer to go on a joint venture with European partners again. They felt the cultural gap between the two groups was too wide to be bridged over a short period of association. Among the six JVs in the group, only Sinbelco JV and SGE-Lee Kim Tah JVs expressed satisfaction with the performance of the JVs.

MRTC's Assessment of European-Local JV Performance

MRTC's Project Manager for Civil & Structures gave a general assessment of the performance of the European-Local JVs. Following are his assessments:

1. The quality of work performed by all the contracts were quite adequate and met the standards specified. He noted that there was very little local involvement in the technical supervision and management of works. There was very little participation by local staff in co-ordination and project meetings with the client.

2. Sub-contractors' management was very messy and the two partners sometimes ended up fighting openly over the appointment.

3. He noted that many of the European contractors were claim oriented and some appointed full time claim consultants to prepare and justify their claims. This could be due to the fear that the client might not give a fair hearing and the low tender price.

4. Technology transfer took place only when the client threatened to take action. Mere lip service was paid to technology transfer than any real transfer.

CONCLUSIONS

Beamish and Lane (1990) during their study of JVs in developing countries in Asia observed that it takes 12-18 months to find and select a good partner. One reason for such a time consuming process is that the partners in Asian countries want to first develop a personal relationship before attempting a business relationship. Reverse is true for Western countries where business relationship may eventually lead to personal relationships. The European-Local JVs never had the time to fully develop their personal relationships since

all of them were formed within three months after the initial contact. The lack of time, gave very little opportunity for the European contractors to study and understand the sensitive local issues. The local contractors were very small and sometimes could not comprehend the working habits of larger European firms. The size of the local firms was also a limiting factor. It prevented them from making any significant contribution to the venture. The European contractors also "used" the local firms only as a vehicle to get the MRTC contracts. This lack of commitment on the part of the European contractors to the joint venture and to his local partner was also a significant contributory factor to the unsatisfactory performance of the JVs. Cultural differences were also responsible for the poor performance.

CURRENT STATUS OF EUROPEAN-LOCAL JV PARTNERS

All but one of the European-Local JVs were dissolved after the completion of MRT contracts. OCK Builders left Bocotra after the completion of the three MRT contracts. Traylor Brothers, the US partner in Bocotra also terminated their agreement after the initial contracts. Borie-Sae and Cogefar continued their partnership under the old name of Bocotra and took three local firms as partners (Lee Kim Tah was one of them) and formed a company called Expressway Construction Pte. Ltd. (ECPL) to build Central Expressway Phase II project for Public Works Department. This subsequent project has been a very unhappy experience for Bocotra. The contract is currently under arbitration (value of claim $138 million for cost overrun and variations).The local partners and Bocotra have issued suits and counter-suits against each other, amongst other things, issuing guarantees (Business Times, 5th Oct., 1994). Campenon-Bernard suffered heavy losses on the MRT project and left Singapore in 1988. Dragage Et Travaux is still

executing projects in Singapore but has stopped working on a joint venture basis. Singa Development pulled out of the Henry Boot-Gammon (HK) JV and is mainly concentrating in building residential properties. Sembawang Shipyard formed a separate construction subsidiary which branched out to building power plants and industrial projects. Singapore Piling decided to go back to its core business of piling and foundations work.

CHAPTER 6

CASE STUDIES OF JAPANESE-SINGAPOREAN JOINT VENTURES

INTRODUCTION

This chapter reports on the interaction between Singaporean and Japanese contractors who formed JVs to build some sections of the Singapore MRT system between 1985 and 1990. The analysis is presented in the form of a case study in order to identify and fully understand the dynamic process of joint venture (JV) formation and operation and the specific factors that influence their performance. The information is presented in the same format as the previous chapter in order to maintain uniformity and consistency.

BACKGROUND INFORMATION

MRTC awarded a total of thirty eight major civil contracts for the construction of the 67 kilometre route. Out of these, 11 civil contracts were awarded to Singapore-Japanese joint ventures. The list of contractors and their awarded value is presented in Table 6.1.

TABLE 6.1

LIST OF AWARDS TO SINGAPORE-JAPANESE JOINT VENTURES

No	Name of Joint Venture	No. of contracts awarded	Life of JVs	Value of Contract ($ Million)
1	Nishimatsu-Lum Chang JV Ltd.	3	May 84 - Sep 89	469.19
2	Kajima-Keppel JV	1	Oct 83 - Jun 87	35.65
3	Aoki-Lim Kah Nam JV	3	Jan 85 - Oct 88	183.90
4	Okumura-Oh Tech Thye JV	1	Dec 85 - Sep 89	60.01
5	Obhayashi-RDC JV	1	Jan86 - Sep 89	70.00
6	Sato Kogyo-RDC JV	1	Mar 86 - Oct 89	91.89
7	JDC-Jurong Eng. JV	1	Oct 85 - Oct 88	79.58
	Total	11		990.22

Profile of Japanese Contractors

The Japanese contractors showed very keen interest in bidding for the MRT contracts. Many of them had established their presence in Singapore well before the go-ahead was given by the Singapore government for the construction of MRT project. During the pre-

qualifying period for the first phase of MRT in early 1983, the Japanese contractors resisted the temptation to form joint ventures with local contractors despite the incentives offered by the government through the preferential margin scheme. The managing director of Obhayashi remarked that fellow Japanese companies had always been their first choice for forming JVs. They successfully avoided forming joint ventures with local firms during the first phase of MRT construction. The choice of a choosing a local partner was literally forced upon them by the competition from other international firms.

The all-Japanese JVs won four of the fourteen Phase I underground tunnelling contracts. Takenaka with Tobishima won the first MRT contract that was awarded in September 83 (Straits Times, 16 September 83). Tobhishima, even though new to Singapore had extensive experience in undertaking three tunnelling contracts in Hong Kong. Takenaka first came to Singapore in 1969 and was involved in the construction of the Singapore's Changi Airport Terminal Building and the Sheraton Hotel. This JV's bid price was $15 million lower than the second lowest bidder and nearly half of that of the engineer's estimates. These results, when announced, stunned many competitors, especially those from Europe and U.S.A.. Some of them withdrew from the local scene altogether when similar results were announced for the next few awarded contracts.

Taisei-Shimuzu-Marubeni JV won two major design and build type contracts worth S$ 134 million(contract Nos. 107A and 108). According to the general Manager of Shimuzu, Marubeni was included in the partnership because of its expertise in arranging project financing. Another member of the big "five", Obhayashi Corporation combined with Okumura Construction Ltd. to win contract No. 109 for the design and construction of

Outram Park station and the tunnels between Tanjong Pagar and Tiong Bharu valued at S$ 73.85 million. Obhayashi opened an office in Singapore in 1971 and has built major office buildings such as the DBS building , NOL building and the Treasury building. Okumura however was a new comer to Singapore.

The other major Japanese contractors who formed joint ventures with fellow Japanese contractors such as Hazama-Gumi and Japan Development and Construction Company (JDC) quietly withdrew from bidding for the MRT construction contracts as they felt the competitors were undercutting prices in order to secure the contracts. JDC continued to pursue other projects in Singapore and nearly eighteen months after the initially failed attempt with Hazama-Gumi, successfully won a contract (Contract No. 403) with Jurong Engineering Limited (JEL) as its JV partner.

Nishimatsu Construction established its presence in Singapore in late 1979 and initially tried to bid for the jobs on its own but failed to secure any contracts. The MRT project manager recollected meeting the Managing Director of Nishimatsu in early 1981 who made a courtesy call on him and made enquiries about possible MRT projects. This was nearly two years before the decision to go ahead with the MRT projects were made! They finally decided to take Lum Chang Construction Pvt. Ltd as their local JV partner and successfully won three MRT contracts (Contract Nos. 101, 107B and 301).

Obayashi Corporation and Okumura Construction who were partners on the design and build contract No. 109, later split and formed separate joint ventures with local partners Resource Development Corporation and Oh Teck Thye Pvt. Ltd. respectively. Obhayashi-

RDC JV won Contract No. 304 and Okumura- Oh Teck Thye won Contract No. 303.

Sato Kogyo established their office in Singapore in 1971 to build the East Coast Expressway on reclaimed land. They also initially tried to bid for the MRT projects on their own but did not succeed in winning any contract. After nearly eighteen months and eight unsuccessful bids, they formed a joint venture with Resource Development Corporation and successfully bid for contract No. 306 in Phase IIA.

Kajima Corporation was one of the first Japanese contractors to recognise the potentials of the Singapore construction market. They first came to Singapore in 1964 and built two major ship repair yards for Keppel Shipyard in 1975 and 1979. When the ship repair industry went through a major recession for three years starting from 1982, Keppel shipyard wanted to diversify into construction. Kajima readily took them as their joint venture partner for the MRT project and successfully secured contract No. 107 for designing and building the tunnels between City Hall and Raffles Place. This contract also included the construction of tunnels crossing under the Singapore river.

Aoki Corporation arrived rather late to the MRT bidding scene and could not locate a suitable fellow Japanese partner. After a thorough selection process which lasted nearly six months, they formed a joint venture with the local firm, Lim Kah Nam Pvt. Ltd. (LKN) and pre-qualified to bid for the latter half of the Phase I contracts. After five failed attempts they managed to secure three MRT contracts (Contract Nos. 203 and 204 in Phase IA and contract No. 404 in Phase IIB).

All the Japanese contractors involved in the MRT project were very large construction firms. Engineering News Record Magazine in 1991 ranked Shimuzu, Kajima, Taisei and Takenaka among the top 5 of the international contractors. Their average turnover was US$ 16 billion. (Levy, 1990). Even in 1982 these four companies averaged a turn over of US$ 4 billion. Except for Aoki and Okumura all other Japanese contractors were well established in the local construction market.

Profile of Singaporean Contractors

Lum Chang stands among the leaders of the building industry in Singapore as a prominent civil engineering and construction firm. It was ranked as the number one local contractor with the largest turnover by the Construction Industry Development Board (CIDB) from 1985 to 1993. Its annual turnover in 1984 was S$ 102 million tripling to over S$ 300 million in 1992. (CIDB, 1992). Lum Chang joined with Fletcher Construction and built the Singapore National University buildings in 1983 and the National University Hospital in 1984. Lum Chang Holdings, the parent of Lum Chang Builders became a public listed company in 1984. Lum chang is a diversified group involved in property development, financial services and management and hotel ownership in the region. It has overseas offices in Malaysia, Thailand, Hong Kong, China and Mauritius. Lum Chang originally pre-qualified for the MRT projects with Fletcher construction. Fletcher Construction decided to withdraw from bidding for MRT projects as it felt that it could not match the low tender prices quoted by the Japanese firms. This left Lum Chang to look for a suitable partner. At the same time Nishimatsu which failed to secure any of the early awards was ready to join with a local partner. Both of them joined together to form one

of the most successful contracting teams in Singapore.

LKN Construction Pvt. Ltd started business as a privately owned construction firm in the mid fifties and built its first contract in 1958. It specialised in building high-rise buildings and became a public listed company in 1983. It was the third largest construction firm in Singapore in 1984 (CIDB Review, November 1985).

Keppel Corporation is a government linked firm which owns and operates the largest shipyards in Singapore. It is a well diversified conglomerate involved in banking, engineering, investment banking, insurance and ship repairing. It is rated as one of the top ten companies in terms of market capitalisation by the Stock Exchange of Singapore (SES annual report, 1985). It was not involved in construction before its participation in the MRT project.

Resources Development Corporation was started as a fully owned government company in 1976 to operate and manage granite quarries in Singapore. It was the biggest manufacturer of ready-mixed concrete and asphalt and was involved in road building for the Public Works Department before its involvement on the MRT project. It became a public listed company in 1986.

Jurong Engineering Limited was established in 1971, by Ishikawajima Harima Heavy Industries of Japan and Jurong Shipyard of Singapore with equal share holding. Jurong Engineering is the only contractor in Singapore which has its own design division. It is also one of the first companies in Singapore that ventured into the Middle-East

construction market in the late seventies. It has branch offices in Malaysia, Indonesia, China, India and U.A.E.

Oh Teck Thye was a family owned construction firm that was mainly in building construction and was one of the sub contractors for the Obhayashi-Okumura JV on the Phase I MRT contract.

Many of the local firms who partnered the Japanese had prior exposure to working with foreign firms either as JV partners or as sub-contractors. Many of them were either public listed firms or government linked firms. Even though the size of these firms compared to their Japanese partners was quite small, they represented the cream of the available local talent.

MOTIVATIONS FOR FORMING A JOINT VENTURE

Many researchers have observed that joint ventures that have performed satisfactorily, usually have partners with compatible objectives. In order to determine the compatibility of their mutual objectives, the two groups were asked to assess on a scale of 1 to 7, the importance of each objective from a pre-prepared list. If the objective received a score of 1, it was considered least important. If it received a score of 7 it was considered as most important. The average score received by each objective was then calculated on the basis of the responses received from the respective firm. These average scores were then used to rank the objectives. These results are presented in Tables 6.2 and 6.3 respectively.

Objectives of Japanese firms

The important objectives, as identified by the Japanese firms who participated in this cae study are presented below in Table 6.2. These are listed in the order of their importance to the Japanese.

Table 6.2

Key Motives of Japanese Firms

Rank	Key motives for forming JV	Average Score
1	Establish /Enhance Local Image	5.3
2	Effective resource utilisation	5.1
3	Protect International market share	4.7
4	Match competition	4.6
5	Government Incentives	4.4
6	Avail of partner's local knowledge	4.3
7	Enter New Market	4.1

Many of the Japanese firms were well established in Singapore before the announcement of the construction of Singapore MRT system. They recognised that the local firms did not have any expertise or experience in the construction of underground tunnelling work and would not be able to make any useful contribution. Hence most of them concentrated on forming JVs with partners from Japan and did succeed in winning a fair share of the underground work contracts in the first phase of MRT construction.

Nishimatsu, Aoki and JDC which were new comers to the Singapore market, after a few failed attempts to win contracts on their own, formed joint ventures with local firms. They came to Singapore to establish a long term presence and win and maintain a decent market share. Hence it was no surprise that the Japanese firms rated establishing a local image as the main motive for forming a joint venture.

They were also concerned about the shrinking work load in the world construction market at that time and the MRT project provided an ideal opportunity to utilise their idle resources and maintain their world market share. These motives were ranked two and three respectively.

The Japanese contractors were not initially persuaded by the government incentives, offered through preferential margin scheme, as sufficient reason for forming JVs with local firms. Only when the bidding became very intense for the second phase of the project, some of the Japanese firms started considering forming a JV with local firms as a worthwhile alternative and as a way to match the competitors' strategies. New comers like Aoki felt that his local partner would be able to provide them with the local knowledge. Commercial risks were not a factor in forming a JV with a local firm.

Local contractors' motives for forming a Joint Venture

The local firms' motives for forming the JV with Japanese is presented in Table 6.3. These are presented in the order of their importance to the local firms.

Table 6.3

Key Motives of Singaporean Firms

Rank	Key motives for forming JV	Average Score
1	Technology Transfer	5.7
2	Government Incentives	5.4
3	Share Commercial risk	5.1
4	Enhance local image	4.8
5	Enter new market	4.4
6	Access to new financial resources	4.3
7	Match competition	4.0

The Singaporean contractors rated technology transfer as the primary motive for forming the joint venture. They expected their Japanese partners to train them in areas of project planning, cost control, contract administration, site management and construction techniques.

The local firms were fully aware that without government incentives foreign firms would not be interested in forming JVs with them. They rated government incentives as the second most important motive for forming the JVs. Sharing commercial risks was a very important factor for many local firms and this was ranked third. Keppel Shipyard was motivated to form a JV as part of its diversification strategy into construction business. Many local contractors like Lum Chang, Lim Kah Nam and Resources Development Corporation wanted to boost their local image through partnering with reputed Japanese firms.

It can be observed from Table 6.2 and 6.3 that the two groups of partners had different sets of criteria for forming the joint venture. This itself posed certain difficulties in operating the joint venture. The impact of these differences on JV performance are addressed later in this chapter.

PARTNER SELECTION PROCESS

The representatives from the Japanese firms and the local firms were requested during the interview to rank the importance of various factors that made them choose a particular partner from a pre-prepared list. The results of their responses are presented in Table 6.4

Table 6.4

Reasons for selecting a particular partner

Description	Japanese Rank	Local Rank
Size/Reputation	1	4
Past association	2	5
Government Link	3	N.A.
Local Knowledge	4	N.A.
Construction resources	5	6
Technology	6	1
Management Skills	7	2
Plant &Equipment	8	3

The Japanese firms which formed JVs with local contractors were interested only in local construction firms that were leaders in the industry . Lum Chang, Jurong Engineering and Lim Kah Nam were the top five contractors in Singapore at the time forming the JVs. The Japanese contractors were also interested in forming JVs with companies that were publicly listed or were in the process of being listed in the Singapore Stock Exchange. All the local partners with the exception of Oh Teck Thye were public owned companies. One of the Japanese directors explained that the size of the firm and their ability to borrow funds for financing the construction were very important considerations in choosing a particular partner. Past associations were also considered as a very important factor. Kajima chose Keppel as a partner in order to oblige a client with whom they were associated for more than ten years. Okumura chose Oh Teck Thye as a partner because they worked as their sub-contractors on their previous projects. Sato Kogyo and Obhayashi chose RDC as a partner because RDC was fully owned by the Singapore government. RDC was also the largest supplier of ready-mix concrete and gravel for concrete in Singapore. The directors of these firms anticipated serious shortage of construction materials during the construction of the last phase of MRT and hence preferred a local partner who could supply these materials without serious interruption to the construction.

The Japanese contractors were not concerned about contributions from their partners with respect to plant and equipment or technology. But they were interested in the partners' contribution towards providing quality local professionals for supervisory positions in the JV as bringing them from Japan would have been very expensive. Some of the Japanese firms like Nishimatsu and Aoki were new to Singapore and chose reputable local firms

as partners in order to acquire a local identity.

The local firms such as Lum Chang and LKN were looking for foreign firms that were large in size and which had an international reputation for building transit railway systems. The local directors of the firms during the interviews preferred Japanese as partners due to their reputation for high quality work and their ability to complete projects within the specified time and budget. The Japanese firms' reputation for their superior construction technology and site management skills also attracted the big Singaporean firms to choose Japanese as JV partners.

Jurong Engineering was a subsidiary of a Japanese firm and it was natural for it to choose a Japanese partner. Keppel shipyard wanted to diversify into construction related business and Kajima was willing to help them achieve that objective. RDC was one of the few local firms that did not have any preference for the nationality of the partner. The director of RDC reported that it was the Japanese firms who made the first approach to form a JV with them. RDC who was mainly a materials supplier till that time, was also very eager to get involved in construction projects through joint ventures with Japanese firms.

Japanese were very methodical in their approach to selecting their partners. Their years of experience in JV formation and operation with fellow Japanese partners made them to go mainly for similar partnerships with fellow Japanese for the MRT project. Once they had no choice but to choose a local partner they established clear criteria for selection. Williams and Lilly (1993) identified that companies who choose partners based on strategic compatibility, complementary skills and resources, relative company size,

financial capability, compatible operating policies and management teams and mutual dependency were likely to perform well. The above discussions indicate that Japanese had taken these factors into consideration in choosing their local partners.

JOINT VENTURE NEGOTIATION AND FORMATION

The partner selection and negotiation process for most of the Japanese-Local joint ventures on an average took six to nine months. This is shorter than the 12-18 months period experienced by Beamish (1984) in his case studies on manufacturing JVs. When the researcher pointed out this to one of the Japanese directors, he remarked that the time available for construction firms to select a partner was mainly dictated by the potential client's tendering dates.

A review of the JV agreements revealed that the JV agreements were not as detailed as that of the European-Singapore JV agreements on commercial and legal issues. Some of the agreements were only 5 pages long compared to an average length of at least 20 pages in the case of European-Singapore JV agreements. This is not surprising since the Standard Form of Agreement for Government Building and Civil Engineering Projects consists of only one page. (Levy, 1993). Review of the agreements showed very little use of restrictive clauses. This showed that the JV partners placed more emphasis on mutual trust than on written clauses in the agreement. Almost all the local partners interviewed indicated that they relied heavily on their Japanese counterparts' expertise to guide them through the JV formation and implementation process. The Japanese were equally committed to meeting their client's and partners' expectations without worrying too much

about the contractual obligations spelt out in the written documents. This implicit trust and commitment helped the partners to perform as a unified team.

The Japanese contractors like Nishimatsu and Aoki who found their partners compatible decided to form a separate JV company and registered their new companies with the Registrar of Companies in Singapore. This is not a common practice in the construction industry. Perhaps this strategy was in line with Nishimatsu and Aoki's objectives to establish a long-term presence in Singapore with a distinctive local identity. Obhyashi, Kajima, Sato-Kogyo and Okumura preferred to have joint venture agreements with their partners for a specific project only.

The Japanese Government classified the joint ventures into two types: a consolidated type and an unconsolidated type. The consolidated type (*kyod o kigyotai*) which is very similar to integrated JV all partners contribute capital, personnel,materials, equipment and work together in an undivided way and all profits and losses shared. Japanese contractors preferred to use this style only with fellow Japanese contractors. Instead they preferred to use the unconsolidated type (*Otsu-gata Kyod o kigyotai*) which is similar to non-integrated JV in which the whole contract is divided into two or more parts and each partner undertakes to complete his portion of the work at his own responsibility and costs (Matsushita, 1993). In either case, the JV is ultimately managed by a management board.

The Japanese contractors were of the opinion that the unconsolidated type would be more suitable when they worked with partners from a different nationality. Such arrangements, they felt, would minimise operational conflicts between the partners. Aoki and Nishimatsu

used the unconsolidated version for their initial contract with MRT. They later used a modified version of the unconsolidated type of JV in their subsequent projects. In this version, they employed directly their partners' personnel in middle management and supervisory levels. This was done at the specific request of their partners to provide them with on-the-job training. These local employees later returned to their parent companies to assume senior management positions.

CONTROL, CO-OPERATION AND TRUST

Ownership Control

The distribution of the equity ownership in the Japanese-Local joint ventures is presented in Table 6.5

Table 6.5

Distribution of equity ownership

Name of joint venture	Equity contribution	
	Foreign	Local
Kajima-Keppel	50	50
Nishimatsu-Lum Chang JV	50	50
Okumura-Oh Teck	60	40
Aoki-LKN JV	50	50
Obhayashi-RDC JV	51	49
Sato-Kogyo-RDC Jv	51	49
JDC-Jurong Eng. JV	50	50

The Japanese contractors were happy to share equal equity with partners with whom they had previous association or with partners with whom they intended to have a long term association. This is apparent in the case of Nishimatsu, Kajima, JDC and Aoki. They insisted on having a majority ownership only with partners with whom they did not have any previous association. This pattern can be seen in the Sato-Kogyo and Obhayashi's association with RDC. The Japanese directors interviewed did not feel the need to have a majority ownership as the joint ventures mostly operated on a non-integrated basis and each partner was responsible for his own efforts and subsequent results.

Management Control

The Japanese contractors were more concerned with having control over the overall management and operation of the JV than with equity control. The Japanese contractors were very keen to maintain their reputation as contractors who could be trusted to deliver a quality product on time and within the budget to their clients. They recognised that this could be done only by controlling critical elements of the JV. Like the European contractors, the Japanese also exercised control over the joint ventures in three areas. They were: strategic control through the joint venture board, operational control through appointment of key managerial and technical personnel and resource control through supply and purchase of plant and equipment and materials.

Strategic Control

In the cases studied in this group, the joint venture board had total control over all the decisions made by the venture. Its board members were appointed on the basis of the equity contribution by each partner. Most of the cases observed in this group of joint ventures had four members appointed to the board with the Japanese member acting as the chairman and the local partner's member acting as vice-chairman. The Japanese nominees were the resident representative of the local branch office and the Project Manager of the Project. The Directors of the local firms represented the local firms' interests in the JV Board.

The joint venture boards normally met once a month and reviewed the progress of the project. The main thrust of the review was on the physical progress achieved by each partner on their respective scope of works. The Japanese were very concerned whenever their local partners had difficulties in keeping to their schedule. In such situations, they seconded their own experts to advise the local partner on ways to overcome the problems. The local partners interviewed could not recall any serious differences with their Japanese partners on strategic issues. Some local directors were initially irritated with the slow response they had from their Japanese counterparts on any joint decisions. They noticed that the local representatives of the Japanese firms had to refer all issues to their head offices for clearance and approval. The local directors complained about this to the top management at the respective head quarters (HQ) of the Japanese firms. The Japanese firms overcame this problem by asking the local representatives to discuss potentially contentious issues simultaneously with their local partners and the HQ, well before the

formal meetings so that consensus could be achieved at the formal meetings. Many of the local directors felt this process very cumbersome and time consuming but decided to go along with their Japanese partners' wishes.

Operational Control

Table 6.6 shows the average contribution of key resources by each partner to the JV.

Table 6.6

Mutual contribution of resources

Description of Resource	Foreign	Local
Project Manager	100	0
Key Project personnel	70	30
Field Staff	25	75
Administration & Personnel	20	80
Plant & Equipment	70	30
Materials	65	35
Financing	90	10

As the table indicates, the Japanese partners contributed most of the key personnel required for the operation of the JV. Since the JVs operated as non-integrated JVs, the local partners had to provide for their own plant and equipment and materials. The high value of yen prevented Japanese contractors from bringing administrative and personnel staff from Japan. They depended on their local partners to provide these resources. This section discusses the impact of each resource on the performance of the JVs.

Project Manager

All the seven JVs studied in this group had Japanese Project Managers appointed by the respective Japanese partners. The Project Managers on an average had at least fifteen years working experience and some of them had spent more than ten years working overseas. They were all fiercely loyal to their parent companies and highly skilled in group management and human relations, steadfastly pursuing their companies' goals and objectives. They were assisted by deputy project managers who were seconded to the JV by the local partners. Many of them were young Singaporeans with three to five years experience after their graduation. The Japanese Project Manager had the overall responsibility for the project and was the sole point of contact with the client. The local Deputy Project Manager was an understudy under the Project Manager and was responsible for completing the work allotted to his firm under the terms of the joint venture agreement. A typical Japanese Project Manager worked twelve hours a day and at times seven days a week and also spent quite a fair share of the day at the job site. Sometimes their project progress meetings extended late in the evening. Many of the local Deputy Project Managers found this style of working very taxing and stressful. This at times resulted in resignations and staff changes in the middle of the project. To some extent this also affected the progress of work of the local partners. In order to mitigate this, even though they were directly not responsible for their partners' work, the Japanese Project Managers took active interest in their partners' work and monitored their progress very closely. This unselfish attitude earned the respect, admiration and trust of their local partners.

Key Personnel

The key technical positions in the JVs were filled by Japanese expatriates. Most of the Japanese project engineers were well versed in design and build projects and were very familiar with checking designs for buildability. The Japanese-Local JVs that were included in this study, were responsible only for the construction. Despite this, the Japanese engineers reviewed all the drawings and in some cases questioned the conservative nature of some of the consultants' designs. For this reason their organisation structure remained top heavy with expatriates in the early stages of the project. Even though these positions were shown to be filled by local engineers during the latter half of the project, the Japanese contractors were reluctant to replace them with the local personnel due to the high turnover of local staff. Since the JVs worked on a non-integrated basis, the local partners were not really concerned about this issue. Tatsuo Kimbara (1991) in his study on "Localisation and Performance of Japanese Operations in Malaysia and Singapore" noted that the degree of localisation in terms of positions transferred was relatively low in Japanese operations in Singapore than in Malaysia and Thailand. This he attributed to the free market policies of Singapore which gave a high degree of freedom to the foreign firms in managing their internal operations.

In some of the Hong Kong railway contracts in which the Japanese acted as contractors, they had great difficulty in preparing and submitting formal claims and lost a good deal of money. In order to overcome their weakness in this area, some Japanese contractors appointed British nationals as contracts managers.

Procurement of Other Resources

The JV Board was responsible for approving only those plant and equipment, materials and sub-contractors which were jointly used by both the partners. However they were constantly worried about the quality of materials and sub-contractors used on the project. They offered to the local partners the services of their procurement network in Japan to procure materials for their portion of the work. But they never forced their local partners to use only their recommended sources. Similarly they advised the local partners to use the sub-contractors whom they have cultivated over a long period. These group of sub-contractors were well trained by the Japanese contractors on their previous projects to meet their time and quality control requirements. To retain their loyalty, the Japanese contractors paid them very promptly and at times helped them with advance payment when ever they ran into financial difficulties. They rarely went for competitive bids for the appointment of sub-contractors. Many of the local contractors initially went for their own sub-contractors . Soon they realised that the sub-contractors were unable to meet the strict quality standards set by the Japanese and decided to accept the recommendations of their partners.

CONFLICTS IN JAPANESE-LOCAL JOINT VENTURES

Japanese contractors meticulously planned to avoid conflict with their partners by taking the following measures. They mainly chose as partners only those firms with whom they had prior associations. They also chose specifically the non-integrated form of JV so that the contacts with the partners during the operational period of the JV were kept to a

minimum, which in turn, would reduce potential for conflict.

The local partners also reported that they did not experience any major disagreements with their Japanese partners. This is reflected in their answers to the questionnaire on a list of possible issues over which they could have had disagreements with their partners during the formation and operation of the JVs. They were asked to identify in a scale of 1 to 7, the level of their conflicts over these issues. A score of one indicated total agreement and a score of 7 indicated total disagreement between the partners. The list presented in Table 6.7 represents possible areas in which the partners had disagreements and their intensity over the life of the joint venture (An average score of 4.0 or more represents serious conflicts and a score of 3.5 or less represents minor disagreements.)

Table 6.7

Conflicts among Partners

No	Description	Average Score
	Strategic and Operational issues	
1.	Technology Transfer	3.0
2.	Interpretation of JV agreement	2.0
3.	Organisation structure	2.0
4.	Selection of Subcontractors	2.0
5.	Procurement of Materials, Plant & Equipment	2.2

Cultural Issues

1.	Sensitivity to Partner's Needs	2.5
2.	Interaction among partners	2.6
3.	Interaction with the Client	2.3
4.	Behaviour of Expatriate Managers	2.7
5.	Language Barriers	3.0

Strategic and Operational Issues

The Japanese partners tried very hard to avoid conflicts but their efforts to do so did not always succeed. For example, the choice of using the non-integrated style of JV management which was supposed to minimise conflict, proved to be a source of conflict between the partners on the issue of technology transfer. The local partners who ranked technology transfer as their number one objective found that the non-integrated arrangement was not conducive to technology transfer process. This arrangement in which the two partners managed their own portions of the project, provided no opportunities for the employees of the local partner to work directly under the Japanese experts and learn from them the appropriate project management tools. Both Lum Chang and LKN recognised this problem during the very early stages of the JV formation and discussed various ways of overcoming this difficulty with their respective Japanese partners.

The Japanese always believed that on-the-job training was the best method of technology transfer(Yamashita, 1991). The Japanese agreed to the secondment of their partners' engineers as their under studies for a limited period of time and train them on various aspects of construction and site management through job rotation. Some senior engineers who had been with the local firms for a few years were also sent to Japan for further specialised training. This arrangement suited the two local partners and they expressed full satisfaction with the process of technology transfer. The Manager of Technology Transfer also was of the opinion that reasonable technology transfer did take place in these two JVs. He also noted that the transfer process did not stop at the completion of the first contract with MRT. He noted that the Japanese continued to train newly recruited local engineers of their partners in their subsequent contracts with MRTC. He also observed that since the contracts awarded to Japanese-Local JVs were mainly elevated structures designed by MRTC appointed design consultants, there was not a great deal of technology to be transferred from the Japanese to local contractors except in the area of site management, project financing and safety. The managing director of LKN shared the MTT's observations. He noted that their company learnt a lot from the Japanese in these areas. His firm adopted the Japanese formal site management system whereby checks and problem solving meetings were conducted on a regular thrice weekly basis imposing greater work discipline, in all their work. The local contractors, who had no exposure to sourcing funds for large projects, learnt about financing packages coupled with deferred payment arrangements (The Contractor, 1987).

The local contractors were initially amused by the Japanese obsession for project safety. Later this turned into admiration as the Japanese contractors started bagging safety awards

awarded by the client every three months. The first safety award was given to Kajima-Keppel for their emphasis on the safety of workers, a good accident-free record of zero lost time on the job-site during the first sixteen months of the project and a clean site.(Straits Times, 1 March,1985). Keppel attributed the key factor for their success to the support given by the top management of the JV to their safety officer Mr. Soh in fully implementing his educational training programmes. The next three awards also went to Japanese contractors. Local contractors, like LKN and Lum Chang learnt from the Japanese good site safety habits and later implemented them in their own portions of the JV contract.

The MTT felt that companies like Keppel did not appear to be exerting themselves and the Japanese partners were having full control of the JV operations. He regretted that Government linked companies such as Keppel and RDC failed to attract and keep qualified staff and thereby missed a great opportunity to learn from their Japanese partners. For example, Keppel who agreed to appoint a suitable deputy Project Manager did not find any one suitable and surrendered the position to Kajima after six months. Similarly RDC declared that they never intended to participate in the actual construction but remain as the concrete and materials supplier for the entire contract. Any judgement about Oh Teck Tye could not be formed since they left the project after only nine months into the project due to bankruptcy.

Cultural Issues

Hofstede's extensive study endeavours to describe differences among cultures using four dimensions (power distance, uncertainty avoidance, masculinity, and individualism). Hofstede's dimensions of culture are particularly relevant in explaining conflicts that result due to cultural differences.

Looking at Hofstede's (1983) comparison of some Asian cultures, Japan is characterised as being in the middle of the range of the individual and collective dimensions and power distance, but high in uncertainty avoidance. It is the most "masculine" of all Asian cultures. Singapore has been characterised as a nation that is low in individualism, has a large power distance, is more tolerant of uncertainty and is highly achievement oriented (masculine).

Even though Hofstede's cultural dimensions indicated possible conflicts between the two cultures, the Japanese managed to avoid serious conflicts through their "win-win" style of conflict management. This is perhaps due to a special characteristics of Asian cultures identified by Hofstede as Confucian dynamism (Hofstede, 1988). The Confucian dynamism emphasises the importance of persistence, thrift, ordering relationship on the basis of status and a sense of shame. Another reason for low cultural conflicts could also be the concept of "face"(self image and social image) which is very important in the Asian cultures. Face is a measure of social value without which a person cannot function in society. Loss of face happens when an individual, either through personal action or the action of people close to him, fails to meet the essential requirements of the social

position he occupies (Steers et. all, 1989). Because of the need to maintain a positive-face, Japanese and Singapore contractors valued interdependence and reciprocal obligations. The Japanese's traditional values such as a strong respect for hierarchy, homogenous values rooted in collective accomplishments, pride in their work and a strong commitment to the JV helped them to establish very good rapport with their local partners.

The Japanese, however experienced minor cultural shocks during the execution of the MRT projects. They found that strict application of Japanese style management such as life time employment and seniority wage system were not practical in the Singaporean context. In the early eighties, even the Singapore Government seriously considered the possibility of introducing Japanese style managerial system to Singapore and launched a comprehensive feasibility study. It gave up the idea after recognising the serious differences between Singaporean and Japanese cultures (Yamashita, 1991). Some of the reasons cited by Yamashita are :

First: Singapore is a society strongly influenced by Western culture. Job-hopping for better renumeration and career advancement are very common. Hence a life-time employment system is therefore impractical.

Second: Singapore is a heterogeneous society, with a population of 76 percent Chinese, 15 percent Malay and 7 percent Indians and 2 percent others. Japan, on the other hand, is a homogeneous society where culture systems such as life time employment and seniority wage system are easily accepted.

Third: there are a very large number of multinationals who are very eager to attract Japanese trained employees with better pay and working conditions.

Some of the Japanese managers were appalled at the lack of loyalty shown by the local employees to their employers. This encouraged them to bring more Japanese staff to fill the key positions. Studies by MRT showed that the Japanese had the highest number of expatriates among all the foreign-local JVs.

The local partners had also a few minor complaints against the Japanese. They observed that the Japanese engineers rarely mixed with the local staff socially. One reason could be their lack of command of English language. Many of the local directors were annoyed by the fact that their counterparts from Japan who exhibited very good knowledge of the English language in social gatherings used interpreters to communicate with them in official meetings. When asked about this, one Japanese Project Manager explained that he mainly used this technique to buy more time to formulate an appropriate response to his partners' queries. He also argued that the usage of the interpreter as "go between", enabled them to mitigate the effects of any highly charged arguments between the partners thereby reducing the chances of direct confrontation.

PERFORMANCE OF JAPANESE-LOCAL JOINT VENTURES

Subjective Assessment of JV Performance by Local Partners

The local partners were presented a list of objectives they set for themselves when they formed the JV and were asked to indicate, on a scale of 1 to 7, the extent to which they attained their targets at the completion of the projects. A score of 1 indicated low level of attainment and score of 7 indicated very high level of attaining their objectives. An average of 3.5 is considered satisfactory. The average score for each objective is presented in Table 6.8.

Table 6.8

Assessment of Achievement of Key Project Objectives

No	Key Objectives	Avg. Score
1	Acquisition of New Technology	3.5
2	Improved Project/Site Management Skills	4.5
3	Effective Utilisation of Resources	4.8
4	Enhanced local image	4.8
5	Return on Investment	2.5

The results suggest that the local partners were reasonably satisfied in achieving their original objectives. Lum Chang and LKN have established long term joint ventures with their partners. Many of them agreed that their association with the Japanese improved their site and project management skills and enhanced their local image significantly.

MRTC Project Manager's Assessment of JV Performance

MRTC's Project Manager for Civil & Structures gave a general assessment of the performance of the Japanese-Local JVs. Following are his assessments:

1. The quality of work performed by the Japanese-Local JVs were quite satisfactory and superior to that of contractors from other nationalities. He observed that the construction sites of most of the Japanese contractors were organised in a standard manner and tended to use similar styles of construction management. He noted that the Japanese insistence on delivering a good quality product had a positive influence on the local partners.

2. Their sub-contractor management was quite efficient and he rarely received complaints from the sub-contractors.

3. Both the Japanese and their local partners preferred to settle their claims through negotiations. Most of the contract claims were settled through commercial settlements. By this process he observed that the Japanese-Local JVs realised a greater percentage of their claims than others involved in the MRT project.

4. He was satisfied that the Japanese contractors made genuine attempts to help their partners to improve their managerial and technical skills and a few local partners such as LKN and Lum Chang greatly benefited from their association with their respective Japanese partners.

He agreed with the overall assessment of the local contractors on the performance of Japanese-Local JVs.

CONCLUSIONS

The performance of Japanese-Local joint ventures offers some valuable lessons. The Japanese contractors exhibited considerable skills in the selection of local partners. They first identified what types of local partners they were looking for and spent up to six months in negotiating the agreements with their preferred partners. They placed significant emphasis on developing personal relationship with their potential partners before sitting down for final negotiations. They also exhibited considerable diplomatic skills in avoiding conflicts and acted very quickly to resolve any contentious issues. Their choice of non-integrated style of JV operation was also responsible in minimising potential areas for conflict. Despite choosing this style they kept a very close watch on their partners' progress and helped them along whenever they were in trouble. Their ability to be flexible and adapt to the local conditions were mainly responsible for the achievement of their long-term objective of establishing a significant presence in the Singapore construction industry.

CURRENT STATUS OF JAPANESE-LOCAL JOINT VENTURE PARTNERS

Nishimatsu-Lum Chang and Aoki-LKN joint ventures have continued their association after the completion of the MRT projects. Nishimatsu-Lum Chang JV has jointly won six contracts in the last four years worth nearly S$ 2 billion. Some of the contracts they won include, UOB Plaza, the tallest structure in Singapore, the piling and foundation works for Suntec City, the largest Exhibition and Convention Centre to be built in Asia. They have established their name as one of the dynamic and reliable contractors in the Singapore market. Aoki and LKN have continued to bid as partners without much of a success. The directors of the joint venture are optimistic about the chances of getting future MRT projects.

JDC and Sato-Kogyo have continued to win new public works contracts with other local partners. JDC joined with a local firm, Ever Great Construction, to build a 400 bed hospital. Sato-Kogyo joined with Sembawang Construction to construct the Singapore Aerospace Centre building. The directors of these Japanese firms informed the researcher that the high value of yen had forced them to seek reputable local firms as partners to win local projects. For the same reason, companies such as Kajima and JDC have diversified into developing and marketing residential properties in Singapore and Malaysia.

Okumura was the only Japanese company that left Singapore after the completion of the MRT project. Their local partner Oh Teck Thye unfortunately declared bankruptcy in Dec 1986 (Straits Times, 12 Feb 1987) leaving Okumura to carry the entire workload. Okumura incurred heavy losses in the project. This unfortunate experience convinced them to return to Japan.

Keppel Shipyard which made an half-hearted attempt at diversifying into construction business decided to branch out into banking, insurance and stock broking. RDC has been bought out by Sembawang Construction, another government linked company. Jurong Engineering decided to concentrate on Electrical and Mechanical works instead of civil engineering works. They are currently the largest E & M contractors in Singapore.

CHAPTER 7

CASE STUDIES OF NIC-SINGAPOREAN JOINT VENTURES

INTRODUCTION

This chapter reports on the interaction between Singaporean contractors and contractors from the Newly Industrialised Countries (NICs) who formed JVs to build some sections of the Singapore MRT system between 1985 and 1990. The analysis is presented in the form of a case study in order to identify and fully understand the dynamic process of joint venture (JV) formation and operation and the specific factors that influence their performance. The information is presented in the same format as the previous two chapters in order to maintain uniformity and consistency.

BACKGROUND INFORMATION

MRTC awarded a total of thirty eight major civil contracts for the construction of the 67 kilometre route. Out of these, 4 civil contracts were awarded to Singapore-NIC joint ventures. The list of contractors and their awarded value is presented in Table 7.1.

TABLE 7.1

LIST OF AWARDS TO SINGAPORE-NIC JOINT VENTURES

No	Name of Joint Venture	No. of contracts awarded	Life of JVs	Value of Contract ($ Million)
1	Wah Chang-Hyundai Joint Venture	1	Jan 86-Oct 89	69.0
2	Antarah Koh - Gammon (HK) Joint Venture	1	Dec 86-Oct 89	96.3
3	Hock Lian Seng - RSEA International Joint Venture	2	Jan 86 - Jun 90	133.8
	Total	4		299.1

Profile of NIC Contractors

Hyundai Construction is part of Hyundai Group, an industrial conglomerate, based in South Korea, with interests in construction/engineering, general trading, ship building & plants, vehicles & rolling stock, machinery & electrical equipment, steel & metal products, construction materials & furniture, shipping & services, an engineering college, and financing. (Chang, 1987). Hyundai was a major contractor in Saudi Arabia where it successfully built the US $ 1 billion Jubail Industrial Harbour in July 1980. The recession in the Middle-East in early 80's forced Hyundai to look for construction markets closer to home. It opened its representative office in Singapore in 1981 and immediately won a major reclamation project for the Port of Singapore Authority worth $ 222 million. It

was followed by another major award to build the Marina Square Super structure contract worth $ 538 million. By the time the MRT projects came up for tendering, Hyundai was well established in Singapore. It was rated as the fourth largest contractor in the world, based on its on annual turnover of US$ 2.5 billion in 1984, by the Engineering News Record Magazine. It had extensive railway construction experience on the Seoul sub-way system.

It initially pre-qualified for tendering for the MRT projects on its own. After a few failed attempts to win any awards during the first phase of MRT construction, Hyundai withdrew from any further bidding. In early 1985 Hyundai again got interested in MRT construction work as it was running low on construction works in Singapore. It teamed up with Wah-Chang Construction (Pvt) Ltd. to bid for Phase II MRT contracts.

Gammon (HK) is a wholly owned subsidiary of Gammon (SEA), based in Hong Kong. It opened its office in Singapore in 1980 and by 1983 became a well established building works contractor in Singapore. It won a $50 million contract to build a high-rise condominium in 1982 (Straits Times, 28 March 1984). It was also involved in geo-technical, piling and earthworks. Gammon (HK) won the track-works contract in Hong Kong in association with Henry Boot and also won successfully with them, the MRT track-works contract for the entire project (This was reported in Chapter 4).

They also won a few sub-contracts works on the MRT project. They were the sub-contractors to Nishimatsu-Lum Chang JV to carry out the excavation works for the City Hall underground station.

RSEA International is the subsidiary of Retired Services Engineering Agency (RSEA), a Taiwanese government owned construction contractor. It was established in Taiwan in 1956 and was the largest civil engineering contractor in Taiwan. It established its presence in Singapore in 1966 and was involved in the construction of several public sector construction projects (Business Times, March 16th, 1987). It won several roadwork projects including the construction of flyovers and sections of Expressways. It had no prior experience in railway construction.

Profile of the Singaporean Contractors.

Wah Chang International is a diversified family owned private company established in the early 70s. It had traditionally been involved in offshore fabrication work, refineries and power stations(Strait times, Jan 6th 1986). It was interested in diversifying into building and civil engineering work and the MRT contract No. 305 was its first railway related work.

Antarah Koh Pte. Ltd. was established in 1970 by two professional engineers as a partnership. The company originally concentrated on marine piling and land piling works and worked as a specialist sub-contractor in these two areas. It built a dock mooring facility and a jetty for Caltex Petroleum in 1982. It was classified as a medium sized contractor by the Construction Industry Development Board (CIDB). It had no prior experience in railway work.

Hock Lian Seng Engineering Pvt. Ltd. was formed in 1969 with an authorise capitol of $10 million. It was authorised by CIDB to undertake public works contracts above $10 million but less than $30 million. It had mainly undertaken public road works contracts such as building a portion of the Central Expressway including flyovers and interchanges. It had no prior railway construction experience.

MOTIVATIONS FOR FORMING A JOINT VENTURE

Many researchers have observed that joint ventures that have performed satisfactorily, usually have partners with compatible objectives. In order to determine the compatibility of their mutual objectives, the two groups were asked to assess on a scale of 1 to 7, the importance of each objective from a pre-prepared list. If the objective received a score of 1, it was considered least important. If it received a score of 7 it was considered as most important. The average score received by each objective was then calculated on the basis of the responses received from the respective firm. These average scores were then used to rank the objectives. These results are presented in Tables 7.2 and 7.3 respectively.

Objectives of NIC Firms

The important objectives as identified by the NIC firms are presented below in Table 7.2. These are listed in the order of importance to these firms.

Table 7.2

Key Motives of NIC Firms

Rank	Key motives for forming JV	Average Score
1	Government Incentives	5.7
2	Match Competition	5.4
3	Protect International market share	5.2
4	Spread Commercial Risk	4.7
5	Local Image	4.6
6	Avail of partner's local knowledge	4.3
7	Enter New Market	4.1

The three NIC contractors were well established in Singapore before the announcement of the construction of the MRT project. Initially none of them wanted to combine with local firms and tried to win the contracts on their own or in collaboration with other foreign firms. They soon recognised that this strategy did not work at all as they were losing out by narrow margins despite very low bids.

The need for forming joint ventures with local partners became very apparent since JVs with local partners would qualify them for the preferential margin scheme. All the three firms identified the government incentive through the PMS as the primary motive for forming the JV with local partners. This was also matching the competitors' strategies.

Hyundai was seriously concerned about its drop in construction orders from its Middle East market and wanted to maintain its international market share by winning new

contracts in Singapore. Both Gammon and RSEA considered the advantage of forming a JV as a vehicle for sharing commercial risks as very important.

RSEA wanted desperately to get the experience of working on the MRT project in order to improve its chances of winning the major share of the construction contracts on the Taipei Rapid Transit Project to be built in the late eighties. Since it tried four times unsuccessfully to win a MRT contract on its own, RSEA felt that a JV with a local partner might be the only way to improve its chances of winning a MRT construction contract. All the three firms also wanted to enhance their local image.

Local Contractors' Motives for Forming a Joint Venture

The motives of the local firms in forming a JV are presented below in Table 7.3 in the order of their importance to the local firms.

Table 7.3

Key Motives of Singaporean Firms

Rank	Key motives for forming JV	Average Score
1	Technology Transfer	6.0
2	Government Incentives	5.7
3	Share Commercial risk	5.5
4	Enter new market	5.1
5	Enhance local image	4.7
6	Access to new financial resources	4.4
7	Match competition	4.3

The three Singaporean contractors rated technology transfer as the primary motive for forming the joint venture. Their expectations of technology to be transferred were similar to that of other local contractors. They expected the foreign partner to train them in areas of project planning, cost control, contract administration, site management and construction techniques.

Sharing commercial risks was also a very important consideration for all the three local firms. The joint venture also provided them with an opportunity to enhance their local image and elevate their status in the local construction industry. All the three contractors in this group had no prior experience in working on a railway project. Participation in the MRT construction, these firms hoped, would enable them to diversify into new areas of business. But without forming a JV with reputable firms,they knew they did not have a chance to achieve this objective.

The two partners had different motives for forming the JV. The local contractors were intent on using the JV to upgrade their skills. The foreign partners were mainly interested in using the JV as a vehicle to maintain or increase their respective firms' work load.

PARTNER SELECTION PROCESS

The two groups of partners were asked to rank the importance of various factors that made them choose a particular partner. The results are presented in Table 7.4

Table 7.4

Reasons for selecting a particular partner

Description	NIC	Local
	Rank	Rank
Government Link	1	N.A.
Local Knowledge	2	N.A.
Size/Reputation	3	5
Construction resources	4	4
Plant and Equipment	5	3
Technology	6	1
Management Skills	7	2

All the three foreign firms had different sets of reasons for choosing a particular local partner. Hyundai was not at all interested in forming a joint venture with local companies. Once they came to the conclusion that JV with a local partner was the only alternative available to improve their chances of success in winning a MRT construction contract, they decided to look for a local partner who had diversified business interest like themselves. Wah Chang International was one of the very few local firms that met this criteron. They expected very little from the local partner in terms of resources contribution. They were mainly looking for the local partner to provide a local identity.

Gammon (HK) tried initially to secure MRT projects through JV with European partners. They formed a JV with Hocktief of Germany and Skanska of Sweden and bid for quite a few first phase contracts without success. Hocktief and Skanska withdrew from the JV

in early 1984 leaving Gammon (HK) to look for new partners. Gammon then tried its luck with Reliance Contractors(A Singaporean building contractor) as their JV partner again with no success. They ultimately chose Antarah Koh as their partner to bid for MRT contract no. 310 which called for building a tunnel across the Telok Ayer Basin involving specialised marine work. Antarah Koh has had extensive experience in off-shore structures and sheet piling. They were keen to use Antarah Koh's specialised plant and equipment. Gammon was also attracted by the fact that Mr. Jimmy Koh, Managing Director of Antarah Koh was also the President of Singapore Contractors' Association.

RSEA also tried its luck on its own to win MRT contracts four times and failed. It finally decided to form JV with a local firm and chose Hock Lian Seng as its JV partner. The two had worked together on building some of the over-bridges for Public Works Department. Like Hyundai, RSEA also did not expect any technical, financial or managerial contributions from their local partner.

Both Wah Chang and Hock Lian Seng initially showed very little interest in working on MRT projects. The executives of the two firms stated that their foreign partners were the ones who initially approached them to form JVs and bid for the MRT contracts. On the other hand, Antarah Koh was very keen to get the MRT experience from the very early days of the project. They tried without success with several foreign partners. They initially formed a JV with Fougerolle of France and then later with Lilley Construction and Kier International. They then tried for the overhead section with Samwhan Corporation of Korea . They finally found a winning combination with Gammon (HK) and won the bid for MRT contract no. 310.

The above discussions clearly show that both local and foreign partners did not employ any systematic selection process in finding a compatible partner. Companies like Antarah Koh and Gammon switched partners several times in order to somehow win a MRT contract. Many researchers have pointed out that selecting a partner without evaluating the mutual compatibilities can lead to conflicts during the operational stages of the JV. This was true in the case of Antarah Koh - Gammon (HK) JV as explained in the later sections of this Chapter.

JOINT VENTURE NEGOTIATION AND FORMATION

The partners in this group felt that they had very little time between choosing, negotiating and signing a joint venture agreement. The negotiations were done at the directors' level and the drafting of the agreements were done by the foreign partners' lawyers and vetted by the local partners' lawyers. Considerable attention in the agreement were devoted to commercial and legal issues. Management and organisational issues received very little attention. Some of the problems experienced by the JVs in this group can be traced to the apparent neglect of these crucial elements in JV negotiations and subsequent agreements (Andrews, 1984).

Apart from these critical issues, the partners also made very little efforts to verify whether the their key objectives were included in the joint venture agreements. For example, the joint venture agreements did not include some of the crucial objectives identified by the local partners. None of the documents indicated how technology transfer was going to be implemented. Since the foreign partners assumed the role of the sponsors for the JVs, the

local partners left the preparation of the contractual details of the JV agreement to their foreign partners.

Apart from the legal form of the joint venture, the partners had to consider the operational arrangements. Gammon-Antarah Koh JV and RSEA-Hock Lian Seng JVs used integrated style of JV arrangement while Hyundai-Wah Chang JV used the non-integrated style. Gammon preferred the integrated style as it wanted total control on the operation of the JV. RSEA preferred the integrated style for the same reason. More over, Hock Lian Seng was a very small firm and did not want to run the risk of managing a portion of the project independently. They preferred to work jointly and were more than happy to let RSEA lead them. Antarah-Koh who have had very little experience working in a JV environment, agreed to the integrated arrangement without fully understanding its implications. Antarah-Koh was also keen on acquiring new managerial and technical skills from its foreign partner and felt that the integrated style was better suited for this purpose. The profit or loss under this style of arrangement was to be shared in accordance with the equity contributions of the partners and this aspect of the integrated style resulted in serious conflicts between the two partners.

Hyundai, like the Japanese contractors, wanted to avoid direct contact, and thereby, conflicts with its local partner. They chose the non-integrated style and allocated specific work to their local partner to manage. Under this arrangement, each partner was responsible for his own portion of work and the profit or loss generated from their respective work.

CONTROL, CO-OPERATION AND TRUST

Ownership Control

The distribution of the equity ownership in the NIC-Local joint ventures is presented in Table 7.5

Table 7.5

Distribution of equity ownership

Name of joint venture	Equity contribution	
	Foreign	Local
Hyundai-Wah Chang JV	73	27
Gammon (HK)-Antarah Koh JV		
Initial	50	50
Final	70	30
RSEA-Hock Lian Seng JV	50	50

Hyundai was of the opinion that majority equity control was essential for the smooth operation of the JV. Since their venture was formed on a non-integrated basis, the 27 percent equity share of Wah Chang also represented their portion of the work in the project.

Gammon-Antarah Koh JV started off with equal contribution from both the partners with Gammon as the sponsor for the JV. Mid way through the project, Antarah-Koh was

frustrated with Gammon's style of management and proposed to sell part of its equity to Gammon. Gammon accepted the offer and increased its stake to 70 percent.

RSEA-Hock Lian Seng contributed equally to the JV and agreed to manage the JV jointly. Through a separate arrangement, RSEA guaranteed Hock Lian Seng from any losses. In return, Hock Lian Seng agreed to hand over the overall management of the JV to RSEA.

The three NIC firms had different views about equity control and its influence over the affairs of the JV. Hyundai equated majority equity stake with management control. Gammon felt that it would control the JV through its contribution of key resources. RSEA negotiated a separate agreement with its partner to get full control over the managing the JV.

Managerial Control

Strategic Control

In all the three cases studied in this group, the joint venture board had total control over all the decisions made by the venture. Its board members were appointed on the basis of the equity contribution by each partner. Most of the cases observed in this group of joint ventures had four members appointed to the board with the member from the sponsoring company acting as the chairman. The joint venture boards normally met once a month and reviewed the progress of the project. In order to protect the interest of minority shareholders the board's decisions, in principle, were expected to be unanimous.

Hyundai-Wah Chang JV did not report any serious problems at the board level. Each partner followed their own style of operation and reported their general progress at each board meeting.

Gammon-Antarah Koh's board meetings initially started off very well. Soon after the commencement of the project itself differences started emerging in staffing the key positions. Antarah-Koh management felt that its senior staff were being ignored for key positions in the JV. Mutual trust and co-operation, the two key elements necessary for the smooth functioning of the JV board, were soon replaced by mis-trust and confrontation. Differences in the selection process of sub-contractors, material procurement and construction procedures started to emerge. One Antarah-Koh director described that the relationship between the two partners became so acrimonious that the board meetings became nothing but shouting matches. Ultimately the two partners sought MRT's help to resolve their differences. Some of these problems can be attributed to the obsession the Gammon's directors had in having total control over all aspects of the project. they failed to differentiate between policy issues and operating issues and were involved in making every decision on behalf of the JV. Some of the conflicts experienced by this JV is a direct result of too much intervention by one partner into the affairs of the JV.

RSEA as the main sponsor of the JV controlled the functioning of the JV board by appointing three directors to the board. Hock Lian Seng had one member appointed to the board. The directors of Hock Lian Seng were not too much worried about the decisions made by RSEA as they were protected against potential losses.

Operational Control

Table 7.6 shows the average contribution of key resources by each partner to the JV in terms of percentage.

Table 7.6

Mutual Contribution of Resources

Description of Resource	Foreign	Local
Project Manager	100	0
Key Project personnel	90	10
Field Staff	40	60
Administration & Personnel	35	65
Plant & Equipment	75	25
Materials	75	25
Financing	90	10

As the table indicates, the NIC partners contributed most of the key resources required for the operation of the JV. This section discusses the impact of each resource on the performance of the JVs.

Project Manager

All the three JVs employed expatriate project managers. Hyundai's project manager was a Korean with more than fifteen years of experience on international projects. He was the deputy project manager on the Marina Square project in Singapore from 1981. He knew the Singapore construction industry practices very well. He however had very limited authority. He had to continuously seek and get his head office's permission in Seoul before implementing any of his decisions. Fortunately this time consuming approval cycle did not directly affect the partner, since the JV was formed on a non-integrated basis. Hyundai took the responsibility for building the viaduct structure in the contract and allocated Wah-Chang the responsibility to construct the station. Under apparent directions from his head-office, the project manager cared mostly about Hyundai's portion of work and allowed the deputy project manager, who was an employee of Wah-Chang to independently manage his portion of work. MRT had to remind Hyundai quite a few times that they were jointly liable for any delays to the project caused by their partner's actions. This was necessary to get Hyundai to help its partner in fulfilling his commitments.

Gammon's senior management mainly consisted of British expatriates. The chairman and the local director were British and the first project manager appointed on the project was a Hong Kong national. He left the project three months after the award of the contract due to serious differences with the JV board. He was replaced by a British national as the project manager. He was in charge of the project for the rest of the duration of the contract. He was technically well qualified and tried his best to smooth out any

differences between the two partners without much success. The contract involved cut and cover tunnelling for nearly 700 metres under the backwaters of the sea. The JV won the contract under very severe competition and hence the profit margins were very low. The project manager in order to control the cost wanted to establish a supervisory team consisting of personnel from his own organisation and tended to reject nominees from the local partner. This upset the local partner and contributed to mistrust and mis-understanding.

RSEA-Hock Lian Seng JV's project manager was a Taiwanese national with many years of management experience in Singapore on earlier RSEA projects. Since Hock Lian Seng delegated all managerial responsibilities to RSEA his task was relatively easy. The deputy project manager was a young engineer appointed by the local partner who did not have much authority but was appointed mainly to gain experience as an understudy to the project manager.

Key Personnel

The organisation charts for the all the JVs called for key functional management positions to be initially filled by expatriate staff to be later replaced by local staff after they received sufficient training. In case of Hyundai-Wah Chang JV, the key personnel were appointed by the two partners to look after their respective portions of work. Gammon mainly brought their own employees from Hong Kong to fill most of the technical positions. They argued that due to the tight labour market in Singapore at that time they could not recruit suitably qualified local personnel. On the other hand the local partner

felt that Gammon purposely rejected his employees so that all key positions could be filled by Gammon staff. In case of RSEA-Hock Lian Seng JV, the local partner contributed very little resources to the project team.

Procurement of Other Resources

Hyundai brought its own plant and equipment from other projects in Singapore. Wah-Chang did the same for its own portion of work. The two partners appointed their own individual sub-contractors.

Gammon and Antarah Koh had very little difficulty in agreeing to the initial set of plants and equipment to be contributed by each partner. Antarah Koh fabricated the sheet piles and took the responsibility for driving them. However differences emerged in appointing sub-contractors. Antarah Koh felt that Gammon would utilise its local knowledge about sub-contractors and accept its recommendations. Even though Gammon patiently listened to their partners' suggestions, they did not accept all the candidates recommended. In a few cases, the performance of Gammon appointed sub-contractors did not perform well leading to further deterioration of the relationship between the two partners. There were also arguments over the procurement of materials. RSEA took the overall responsibility for all procurement activities. But they showed their lack of experience in handling a $100 million dollar project. They continuously went for sub-contractors who bid the lowest tender. This resulted in poor quality of workmanship and delays. For piling work alone, they had sixteen contractors working on the project. At the time of award of contract RSEA's Managing Director in a press release stated that they selected Hock Lian Seng

as their local partner in order to gainfully utilise their local knowledge of sub-contractors, local customs and regulations. Apparently this perceived local knowledge of the local partner seems to have been hardly utilised.

CONFLICTS IN NIC-LOCAL JOINT VENTURES

The NIC-Local JVs were presented a list of possible issues over which they could have disagreements with their partners during the formation and operation of the JVs. They were asked to identify in a scale of 1 to 7, the level of their conflicts over these issues. A score of one indicated total agreement and a score of 7 indicated total disagreement. The list presented in Table 7.7 represents areas in which the partners had clashed frequently over the life of the joint venture (An average score of 3.5 or more).

Table 7.6

Conflicts among Partners

No	Description	Average Score
Strategic and Operational Issues		
1.	Technology Transfer	4.5
2.	Interpretation of JV agreement	4.4
3.	Organisation structure	4.7
4.	Selection of Subcontractors	4.5
5.	Procurement of Materials, Plant & Equipment	4.0

Cultural Issues

1.	Sensitivity to Partner's Needs	4.5
2.	Interaction among partners	4.4
3.	Interaction with the Client	3.5
4.	Behaviour of Expatriate Managers	4.0
5.	Language Barriers	2.5

Strategic and Operational Issues

All the three local firms declared technology transfer as one of the prime objectives for forming the JVs. All three of them expressed disappointment that such transfer did not take place. Wah-Chang and Hyundai did not share any of the work they performed and as such did not have any opportunities for technology transfer to take place. The relationship between Antarah-Koh and Gammon was never smooth. The personality conflicts between Antarah-Koh's and Gammon's top management prevented the two partners from drawing up any technology transfer programme. Hock Lian Seng hardly had any of its professional staff employed by the JV. Furthermore, this JV heavily depended on sub-contractors to complete the various work packages (Nearly 80 percent of the work was awarded to sub-contractors).

As none of these contracts were awarded on a preferential margin basis, the Manager of Technology Transfer(MTT) was only able to monitor the technology transfer process in

these contracts. The success or otherwise of any Technology Transfer Programme was entirely dependent on the efforts of the two partners themselves. He noted in his reports that all three JVs made very little efforts to implement a formal technology transfer programme. He also observed that among the three groups of JVs, the least amount of technology transfer took place in joint ventures between local firms and NICs.

Antarah-Koh also experienced organisational conflicts with Gammon. For example, Antarah-Koh was assigned the position of Assistant Project Manager. Antarah-Koh to their shock found that the person whom they assigned to that position was actually designated as Assistant to the Project Manager in the JV's organisation chart. This did not amuse the directors of Antarah-Koh. The issue was finally resolved when Antarah-Koh's nominee was redesignated as Production Manager. The whole process resulted in the loss of mutual trust between the two partners. There was also no clear responsibilities and authorities assigned to various positions in the organisation chart of the JV. The person who was assigned the production management had four site agents reporting to him. The same chart also indicated that the person who was assigned the production manager's role was also functioning as a planning engineer. The planning engineer was shown in the chart reporting to the site agents! This not only confused the partner, it also confused the client.

Antarah-Koh also complained that their partner did not select any of their recommended sub-contractors for the project. During the JV negotiations, the two partners agreed to delegate the authority of running the project to the Project Manager. This included selection of sub-contractors. Since the Project Manager was from Gammon's organisation, Antarah-Koh believed that he followed Gammon's instructions only. There were

significant delays in the early stages of the project. Antarah-Koh believed that these delays were entirely due to mismanagement by Gammon's staff. As the JV was an integrated arrangement, both partners were to share the profits or losses from the project. Antarah-Koh was concerned that the losses could be beyond its financial capability and wanted to reduce its exposure to losses by disposing of some of its equity. Gammon readily agreed to buy the twenty percent equity that was offered for sale and raised its own equity share to seventy percent.

The confrontation between the two partners was not over, even after the completion of the project and termination of the JV. Gammon sued Antarah-Koh for not contributing its share of the losses incurred in the project.

RSEA-Hock Lian Seng JV had very few major conflicts to report as most of the conflicts were all minor. This was mainly due to RSEA taking full responsibility for the project as well as protecting Hock Lian Seng against any potential losses from the project.

Cultural Issues

Song Young Hack (1990) who has extensively studied Korean culture has made the following observations about their culture. The Korean world view and social relations have been influenced by both the indigenous Shamaistic religion and the ancient religious and philosophical traditions of China. Hence the Confucian philosophy and values had influence over Korea's culture for centuries. They have therefore a lot in common with other Asian Chinese cultures. They have a strong and homogenous cultural orientation

which emphasises the collective or group over the individual and therefore the need for the maintenance of harmony in social relations. Hence Koreans tend to solve problems or the conflicts within themselves rather than by expressing their opinion openly. In a group-oriented society the most desirable form of relationship between the individual and the group is not for them to oppose each other but for the two to become one. This intricate vertical relationship within the Korean organisation makes it difficult for them to admit any one from outside their culture into their group. This explains why Hyundai was at first reluctant to form a JV. When they were forced to form a JV in order to improve their chances of winning a contract, they chose the non-integrated form of JV that so that potential for conflict could be minimised. But it was not possible to find an explanation for Hyundai's lack of concern for his partner from Song Young Hock's work. On the contrary, Japanese contractors who also have a similar cultural background to that of the Koreans made sure that the progress of their local partner was in line with the overall program established for the contract. An answer to this behavioural pattern can be found in Shuji Hayashi's work on "Culture and Management in Japan" (1988). He conducted a survey among Japanese, Korean and Taiwanese companies to find out their attitude to rule compliance. He found that only 7.4 percent of the Japanese favoured rule compliance while 52.7 percent Koreans and 29.7 percent Taiwanese preferred adherence to written agreements. In other words, Japanese management style emphasized completion of a task and attainment of objectives over strict adherence to established rules. This apparent preference to rule adherence by the Koreans might have resulted in their reluctance to get involved in their partner's affairs.

Even though Gammon was a Hong Kong based company its management team was totally British and naturally had a British biased cultural attitude. According to Hofstede's model of cultural dimensions, British are very high on individualism (a score of 89) while the Singaporeans are very high on collectivism (a score of 20). British manifest a small power distance(score of 35) while Singaporeans manifest a larger power distance(a score of 74). These two characteristics in a project management context mean that British are more inclined favour completion of a task(individualistic nature) ahead of building a relationship while Singaporeans are more likely to favour building a working relationship (collective) before worrying about the completion of the task. Antarah-Koh wanted to work as equal partners with Gammon and adopt a collective approach to decision making. They expected Gammon to consult them before making the major decisions such as the appointment of key personnel, sub-contractors and choice of construction methods. In an integrated JV such expectations were not uncommon. Unfortunately Gammon felt that they had the capability to make the right decisions and hence politely ignored Antarah-Koh's suggestions . Gammon, in their earlier JV with Singa Development on the track works contract (Contract 110) had no difficulty at all in convincing Singa to accept all their decisions. Perhaps Gammon expected the same response from Antarah-Koh. Antarah-Koh's management considered Gammon's actions as blatant efforts on the part of Gammon to make Antarah-Koh lose "face". In the Chinese system of values, a person loses "face" when his/her set of claims is implicitly or explicitly questioned or denied. Such a loss of "face" initially creates embarrassment and later anger in the person so questioned because, with or without justification, it threatens to strip away the role he/she has been taking with others. This conflict in values was mainly responsible for much of the mistrust between the two partners.

The cultural orientation of Taiwanese and Singaporeans are very similar. According to Hofstede's cultural dimensions both prefer a collective approach to decision making and manifest large power distance. Both are predominantly Chinese societies brought up in Confucian philosophy. But the Taiwanese are very high on uncertainty avoidance (score of 69) compared to Singaporeans who are low on uncertainty avoidance (score of 8). In order to preserve the harmony and to minimise any uncertainty, RSEA convinced Hock Lian Seng to hand over all decision making to them. They were able to achieve this through patient negotiations. They also guaranteed Hock Lian Seng from any losses. RSEA also appointed a project manager who was a Singaporean permanent resident. These flexible approaches enabled RSEA to lead the JV very harmoniously. This JV is a good example where similarity in culture between the partners enabled them to adjust and play their respective roles for the benefit of the joint venture.

PERFORMANCE OF NIC-LOCAL JOINT VENTURES

Subjective assessment of JV performance by Local partners

The local partners were presented a list of objectives they set for themselves when they formed the JV and were asked to indicate, on a scale of 1 to 7, the extent to which they attained their targets at the completion of the projects. A score of 1 indicated low level of attainment and score of 7 indicated very high level of attaining their objectives. The average score for each objective is presented in Table 7.8. an average of 3.5 is considered satisfactory.

Table 7.8

Joint Venture Performance

No	Key Objectives	Avg. Score
1	Acquisition of New Technology	3.0
2	Improved Project/Site Management Skills	3.1
3	Effective Utilisation of Resources	3.0
4	Enhanced local image	4.1
5	Return on Investment	2.2

The three local contractors had divergent views about the performance of the JVs. Wah-Chang was dissatisfied with the lack of co-operation and guidance from their senior partner. They were also disappointed that Hyundai did not make any serious effort to transfer any technology. While Wah-Chang was positive about the benefits of doing work on a JV basis, they indicated that they would not form another JV with Hyundai.

Antarah-Koh who is still battling a legal case with Gammon on the issue of sharing the losses, regretted the decision to get involved in a JV with an unknown partner. The Managing-Director of Antarah-Koh was philosophical about their experience. He was still in favour of forming JVs to perform construction related tasks and the lessons he and his firm learnt from this experience would be of immense use in future JV negotiations.

Hock-Lian Seng-RSEA JV made significant losses on both the contracts. Several reasons could be attributed for their losses. Some of them are a low tender price, lack of

experience in planning and coordinating the works of several contractors and sub-contractors within a very tight time frame and lack of leadership at the board level. RSEA despite the losses was satisfied with the experience as their primary objective was to gain exposure to railway construction. Hock Lian Seng was also satisfied with the experience as it enhanced their local image

MRTC's Assessment of NIC-Local JV Performance

MRTC's Project Manager for Civil & Structures gave a general assessment of the performance of the NIC-Local JVs. Following are his assessments:

1. The quality of work performed by Hyundai-Wah Chang JV and Gammon-Antarah-Koh met the standards specified. However RSEA-Hock Lian Seng JV's work was accepted with a long list of defective work to be rectified during the maintenance period. He noted that there was very little involvement from Hock Lian Seng in the technical supervision and management of works. He had similar observations about the involvement of Antarah-Koh's staff in the co-ordination and management of their contracts.

2. He noted that sub-contractors' management was very unsatisfactory in all the JVs. In the case of Gammon-Antarah Koh, the two partners sometimes ended up fighting openly over the appointment.

3. He noted that Gammon was more claim oriented and contractual in his approach than the other two overseas contractors. The other two JVs preferred informal meetings

to resolve claims while Gammon preferred to follow the procedures laid out in the contract. This difference could be due to the different cultural background of the firms.

4. He noted that none of the JVs made any serious efforts towards technology transfer. Mere lip service was paid to technology transfer than any real transfer.

CONCLUSIONS

The three joint ventures studied under this group had a mixed bag of results. Hyundai and Wah-Chang did very little work together on their contract and Wah-Chang in particular lost out the opportunity to learn project management techniques from an internationally reputed firm. Hyundai also treated the JV only as a commercial vehicle for maintaining its international market share. Both Gammon and Antarah-Koh did not trust each other and ended up quarrelling over every major issue. Financial losses further fuelled the conflicts between the two. Their JV is a good example of a JV failing due to fighting between partners over the control of the operation of the JV. The conflicts between Antarah-Koh and Gammon confirmed the views expressed by Ascot (1994) in his article in Business Asia. He observed that conflict between partners started as soon as the management of the foreign partner began treating the JV as a fully owned subsidiary. The RSEA-Hock Lian Seng can be considered as a success as both showed flexibility and exhibited mutual trust. This JV is also a good example of a JV succeeding by delegating control of the operation of the JV to one partner.

CURRENT STATUS OF NIC-LOCAL JV PARTNERS

Hyundai Corporation continued its presence in Singapore by winning several large contracts in association with different JV partners. It won the S$ 1 billion superstructure construction of the Singapore Convention centre with Ssanyong Corporation a fellow Korean contractor. Because of the size of the project, the client invited bids only from JVs. Surprisingly this is the first time that these two firms have worked together. Hyundai joined with Jurong engineering to build the Singapore Airport Second Terminal Building. It again won one of the two civil contracts awarded to build the extension of the MRT line to Woodlands in 1992 in association with a small local firm. In all these cases Hyundai formed a joint venture on a non-integrated basis only. The General manager of Hyundai during the interview with the researcher acknowledged that Hyundai's approach to JV is mainly driven by commercial considerations.

Gammon has considerably reduced its commitments in Singapore. It joined with Henry-Boot again to win the track works contract for the MRT extension to Woodlands. Their previous local partner Singa Development dropped out of the original JV.

RSEA returned to Taiwan to concentrate on the Taipei metro works. It continued to bid for the Woodlands extension works with Hock Lian Seng without any success. RSEA-Hock Lian Seng managed to get a major civil works contract on the Taipei Metro Project.

Wah-Chang and Antarah-Koh turned into very successful property developers. Wah-Chang established its presence in the Thailand property market by building Hotels and apartment complexes in the island of Phuket. Antarah-Koh formed a JV with Hanoi Housing Development Company to develop a city in Viet Nam.

CHAPTER 8

COMPARISON OF CASES

INTRODUCTION

The purpose of this chapter is to achieve two objectives. The first objective is to compare the three group case studies presented in the previous three chapters and analyse the similarities and/or differences between the three groups of foreign firms in dealing with their local partners. The second objective is to test the validity of the hypotheses developed in Chapter 3. The eight hypotheses are listed below for easy reference.

Hypothesis 1 (see p.68): JV's performance is enhanced when the partners work together to achieve their mutual compatible objectives.

Hypothesis 2 (see p.68): The performance of JV is increased when partners are selected to provide complimentary resources and skills.

Hypothesis 3 (see p.69): The performance of the JV is enhanced when the partners forming the JV have had favourable past association.

Hypothesis 4 (see p.69): JV performance is enhanced when one partner holds dominant equity share in the venture.

Hypothesis 5 (see p.70): The performance of JV is enhanced when one partner exercises managerial control over the operations of the JV.

Hypothesis 6 (see p.70): The performance of the JV is enhanced when the partners trust each other, have mutual need and commitment.

Hypothesis 7 (see p.70): The performance of JV is adversely affected when the level of conflict increases.

Hypothesis 8 (see p.71): JVs formed between partners with similar cultural attributes are likely to perform better than JVs formed between partners coming from different cultural backgrounds.

It is worthwhile repeating here that the hypotheses to be tested in this Chapter, were derived from the experiences of JVs in industries other than construction. The discussions and analysis in this chapter will attempt to establish the relevance of these hypotheses to the construction industry.

The comparison and review of the three group case studies are presented under five major sections. The first section compares the objectives of foreign and local firms and analyses their implications on JV performance. The discussions in this section are also used to test the validity of hypothesis No.1. The second section reviews the partner selection process employed by the various groups of partners. Based on the review, the validity of Hypotheses Nos. 2 and 3 are tested. In section three, the JV formation process is reviewed. In section four, the contributions made by the partners to the JVs are compared and their implications on the JV performance are analysed. The analysis presented in this section is used to test the validity of hypothesis No. 4. Partner related interactions are compared and analysed in section five. In this section, the impact of management control, trust, need, commitment, cooperation and/or conflict and cultural differences on JV performance are then reviewed and analysed. The results of these analysis are used to test the validity of hypotheses Nos. 5 to 8.

As an easy reference for further discussions in this chapter, a summary of the key data of the JVs analysed in this chapter is presented below in Table 8.1. These are the overall assessment of the performance of JVs made by the local partners.

Table 8.1

Summary of JV Performances

JV Name	Type	Equity Share	JV performance rating by the local partner
Sinbelco-Hytech*	Integrated[1]	50:50	Satisfactory[3]
Bocotra-Ock*	Integrated	75:25	Unsatisfactory[4]
Dragage-Sembawang	Integrated	68:32	Unsatisfactory
Campenon-Singapore Piling JV*	Integrated	51:49	Unsatisfactory
SGE-Lee Kim Tah	Integrated	70:30	Satisfactory
Henry Boot-Gammon-Singa	Integrated	73:27	Unsatisfactory
Nishimatsu-Lum Chang	Non-Integrated[2]	50:50	Satisfactory
Kajima-Keppel	Non-Integrated	50:50	Satisfactory
Aoki-LKN	Non-Integrated	50:50	Satisfactory
Okumura-Oh Tech Tye	Non-Integrated	60:40	Not assessed
Obhayashi-RDC	Non-Integrated	51:49	Satisfactory
Sato Kogyo-RDC	Non-Integrated	51:49	Satisfactory
JDC-Jurong Eng.	Non-Integrated	50:50	Satisfactory
Hyundai-Wah Chang	Non-Integrated	73:27	Unsatisfactory
Gammon(HK)-Antarah-Koh	Integrated	70:30	Unsatisfactory
RSEA-Hock Lian Seng	Integrated	50:50	Satisfactory

[1234] Legend: * - Contracts awarded on the basis of preferential margin.

[1] Integrated JV : In this style of JV, the parties essentially agree to perform their work as if it were performed by a single corporation. All profits or losses to be shared in accordance with a previously agreed ratio.

[2] Non-integrated JV: In this arrangement, the partners carry out their respective portion of work separately. They are responsible for their own profits or losses derived from their portion of work.

[3] Satisfactory performance is achieved when the partners'original objectives are largely met

[4] Unsatisfactory performance is achieved when the partners'original objectives are not met.

SECTION ONE: PARTNERS' OBJECTIVES

Foreign Partners

The key objectives of the three groups of foreign firms are presented in Table 8.2. The objectives are presented in the order of importance chosen by the respective groups.

TABLE 8.2

Key Objectives of Foreign Firms

No.	European Firms	Japanese Firms	NIC Firms
1	Government Incentives	Establish Local Image	Government Incentives
2	Local Knowledge	Effective Resource Utilisation	Match Competition
3	Protect International Market Share	Protect International Market Share	Protect International Market Share
4	Match Competition	Match Competition	Spread Commercial Risk
5	Enter New Market	Government Incentives	Local Knowledge

Even though the order of the key objectives are different for each group, the main objective of all the foreign firms was to successfully tender for the MRT contracts. The three groups took slightly different approaches to achieving this main goal.

The incentives provided by the local government through preferential margin scheme and the intense competition from other foreign firms left the European firms with no other option but to form JVs with local firms in order to increase the odds of winning a MRT

tender. Many of the European firms viewed the formation of JV with the local firms as a temporary but convenient arrangement to satisfy their short-term needs. The NIC firms had very similar objectives in forming JVs with local firms. They also needed the JVs as vehicles to achieve their short-term commercial objectives. These two groups of firms were not looking for association with the locals to extend beyond the MRT project.

Japanese firms, on the other hand, viewed Singapore as a strategic market full of future potentials. Many of the Japanese firms were well established even before the announcement of the construction of the Singapore MRT. They were keen to further increase their existing market share in the local construction market through winning a fair share of the MRT contracts. The well established Japanese contractors were so confident of out pricing any competition that they did not form JVs with local contractors to take advantage of the preferential margin scheme. They initially however formed JVs with fellow Japanese contractors to share the commercial risks that are inherent in any underground works and successfully won a large percentage of the first phase MRT contracts beating the stiff competition from other foreign firms. But the apparent underpricing by the Japanese in the early stages of the project, forced other contractors to tender even more aggressively for the other un-awarded contract packages, forcing even the Japanese to finally look for local partners to compete on even grounds with the rest. Even then, the Japanese contractors took their time and chose their partners carefully with a view to having a long-term association.

None of the foreign firms wanted a local partner to fill any technological gap or to provide any missing resources they did not possess. The above discussions show that all the foreign firms wanted the JVs with the local firms mainly to utilise the government

incentives: only the time frame for the proposed association was different; the Europeans and NICs wanted short-term relationships while the Japanese preferred long-term relationships.

Local Firms' Objectives

The key objectives of the local firms in the order of their priorities were:

1. To acquire new technology and management skills.
2. To take advantage of the government incentives to form JVs with foreign firms and win MRT contracts.
3. To spread commercial risks
4. To effectively utilise available resources.

All the local firms involved in this study were quite eager to upgrade their skills. The government incentives, they knew, were attractive enough for the foreign firms to seek them as partners. At the same time, they were also aware that without joining the foreign partners through a JV, they would not be able to even pre-qualify for the MRT projects as they had no prior experience in tunnelling and other underground works. They also needed the foreign partners to share the commercial risks. The local firms also wanted to enhance their local image through their involvement in the MRT project.

Discussions on Hypothesis 1:

"JV's performance is enhanced when the partners work together to achieve their mutual compatible objectives."

It is quite evident from the discussions presented in this section that the local and foreign firms observed in this study were pursuing different sets of objectives. But the mere existence of differences in objectives does not mean they are incompatible (Dutta & Rasheed, 1993). However in order for the JV to succeed, it is critical for the potential partners to discuss and identify the differences very early in their association (ideally before the venture is formed) and adjust their expectations so that they may pursue jointly a set of mutually accepted goals.

Among the three groups of foreign firms, the Japanese firms recognised that their partners' primary objective was to acquire technology transfer. They helped their partners to achieve this goal by providing ample opportunities for the local employees to work with Japanese engineers. Similarly the local partners of Sinbelco and SGE were quite satisfied with the level of assistance provided by of the two European firms in transferring technology and management skills. All these JVs received satisfactory rating from the local partners (Please refer to Table 8.1).

On the other hand, many of the European and Korean firms largely ignored the calls from their local partners to help them learn modern construction management techniques but focused all their attention in pursuing their own firms' individual objectives. This self-centred approach adopted by the European and Korean firms resulted in their local partners rating their JV performance as failures. Based on the above discussions it can be concluded that hypothesis No.1 is valid.

SECTION TWO: PARTNER SELECTION PROCESS

The European firms did not employ any specific strategy in selecting their local partners. The frantic search for a "suitable" local partner by the European firms was well documented by the local newspapers. The European firms would partner any local firm that would give them a chance to first pre-qualify and later win the MRT contracts. None of the selection criteria recommended by other researchers (Geringer, 1988; Contractor, 1989) were employed by these group of contractors.

The Japanese firms did employ a systematic process of partner selection. They did take into account the size and reputation of potential local partners. Past association was also an important consideration in their partner selection process. They also looked for partners who had access to raw materials and good government links.

The NIC firms like Hyundai and RSEA had very little pool of local contractors left for selection by the time they decided to form JVs with local firms. None of the contractors from the NICs seem to have employed any specific partner selection process.

Discussions on Hypotheses 2 and 3

Hypothesis 2

"The performance of the JV is increased when partners are selected to provide complimentary resources and skills."

The case studies presented in the previous three chapters clearly demonstrate the

relationship between careful partner selection and JV performance. The Japanese-Local JVs in general were more successful than the European and NIC contractors because of their careful selection of local partners. The local partners selected were all well established firms who could manage their portion of the work allotted to them under the JV agreement, with minimal help from the Japanese. Some of the local partners helped the Japanese partners with procurement of local supplies. The Japanese firms' favourable experience with their local partners strongly supports the validity of the above hypothesis.

Hypothesis 3

"The performance of the JV is enhanced when the partners forming the JV have had favourable past association."

Two JVs, among the sixteen studied, reported that their venture was formed because of their favourable past association. Lee Kim Tah which worked with SGE on an earlier public housing project as JV partners, continued their association on the MRT project. The JV partners worked well with each other and the local partner expressed complete satisfaction in attaining his goals. Kajima and Keppel shared a client-contractor relationship when Kajima built the Keppel Shipyard in the middle 1970s. Kajima accommodated Keppel's request to form a JV for tendering for the MRT project as part of Keppel's desire to diversify into the construction market. Keppel's participation in this venture, unfortunately was very minimal. However the management of Keppel asserted that they achieved their original objectives. These two samples support the hypothesis that firms who have had favourable past association would continue to perform well as partners in new JVs.

SECTION THREE: JOINT VENTURE NEGOTIATION AND FORMATION

The JVs studied in this research adopted a two stage negotiation process. A memorandum of understanding was first signed between the potential partners which committed them to bid together for the MRT project as a JV. Serious negotiations started only after the award of the MRT contract. The client required the submission of a legal JV contract that is acceptable to the Singapore legal system before formally signing the MRT contract documents. This requirement left very little time for the partners to negotiate and agree on every requirement of the partners. The process described here is quite different from the normal negotiation practices conducted during the formation of JVs in the manufacturing and services industries. In these industries it is quite common for partners to spend several months in negotiating a mutually acceptable agreement.

In this particular study, the foreign firms generally initiated the preparation of the JV agreements. The JV agreements between European and Local contractors contained detailed procedures for dealing with all legal, financial and commercial issues related to the formation, operation and termination of the JVs. The European firms in general viewed the JV agreement as a master document for detailing the duties, responsibilities, and obligations of each party to the venture and as a reference guide for resolving all issues related to the JV. Surprisingly, the review of the JV agreements between European and local firms did not make any reference pertaining to the original objectives of the partnering firms. For example, there was no reference to how technology transfer, one of the prime objectives of the local partner, was going to be implemented.

The European firms also used the JV agreements as a tool to control the operation and management of JVs. As a further measure to establish total control, all the European-Local JVs were organised as integrated JVs.

On the other hand, the JV agreements between the Japanese and Local firms were quite brief. This is because the Japanese believed that the formal agreements themselves could not guarantee success of the JV. In some of the JV agreements there was no reference to arbitration and other dispute resolution clauses. This showed that the Japanese expected to resolve all differences with the partners only through negotiations. These documents also showed that the Japanese preferred to respect verbal agreements than rely on written ones. This in a way encouraged the local partner to trust his Japanese counterpart. The Japanese, in order to minimise potential conflicts with local partners, decided to use the non-integrated style of organisation for their JVs. They did not believe that their total control is essential for the success of the JV.

The NIC contractors did use both the integrated and non-integrated style of JVs. Gammon (HK), whose management team mainly consisted of British expatriates, established a fully detailed JV agreement just as the European firms did. They also followed the Europeans in trying to establish full management control over the JV, by opting for an integrated style JV. Gammon, not surprisingly, experienced the same difficulties that their European counterparts had in operating the JV.

The Korean firm, Hyundai, followed the Japanese style of having a short JV agreement and similarly organised its JV as a non-integrated venture. But the similarities stopped

here. Unlike the Japanese, Hyundai made no efforts to help its partner to achieve its objectives. This strict adherence to policy of non-interference resulted in the JV ending as a failure.

The Taiwanese firm, RSEA, through a separate agreement guaranteed to protect the local firm from any losses. This allowed the Taiwanese firm to operate the JV as if it was its own foreign subsidiary. The local firm which was very small went along with the decisions of its foreign partner as it had nothing to lose from its association with its foreign partner.

In all these cases, the local contractors seem to have played a very passive role in the drafting of the JV agreements or in the evolution of the JV organisational structure. This could be attributed to their inexperience in dealing with foreign firms. The interviews with the local executives indicated the blind trust some of the local firms placed on their foreign partners to help them achieve their objectives. Serious conflicts arose when this trust was violated.

The discussions above show that the national culture had an indirect influence over the JV negotiation and formation. Firms coming from a particular group of countries adopted similar style of agreements and organisational designs. All European firms adopted the integrated style JV and preferred majority equity control. The Japanese firms and the Korean firms on the other hand preferred the non-integrated style JV. The Japanese in general were not concerned about sharing the equity with local partners.

SECTION FOUR: TASK RELATED INPUTS FROM PARTNERS

This section discusses the resource contribution of the foreign and local partners for performing the tasks for which the JVs were formed. The discussions will centre around how the foreign partners tried to exercise control over the JVs through the use of these contribution of resources.

Equity Contributions

The discussions on the relationship between the level of equity ownership and JV performance is presented through the analysis of the hypothesis on this issue.

Discussion on Hypothesis 4

" JV performance is enhanced when one partner holds dominant equity share in the venture".

The relationship between equity ownership and JV performance as observed in the cases studied in this research is presented below in Table 8.3.

Table 8.3

Relationship between Equity Ownership and JV Performance

Description	Total No	Performance Rating	
		Satisfactory	Unsatisfactory
JVs with foreign firms holding majority share	9	3	6
JVs with foreign firm holding equal share	6	6	0

The results presented in the above table show that JVs with equal contributions from the partners performed far better than the JVs in which one partner had a dominant stake. These results do not support the hypothesis that was developed from the experiences of JV partners in manufacturing and services industries. The following section explores the reasons why results from this study are not in accordance with the results from earlier research conducted in other industries.

The primary reason for the difference in results can be traced to the difference between the construction industry and other industries in fixing the price of the finished product. In the manufacturing and service industries, the price of finished product can be estimated with reasonable certainty. If the product faces intense competition in the market place, the firms producing the product can take other measures to reduce the cost of production. In the construction industry, the price of the finished product is fixed even before it is produced. The contractor who won the job under intense competition would have set his profit margin close to zero in order to win the tender. The construction process itself is very long and it involves several players outside the contractor's own organisation who can significantly influence the final cost of the product. These factors introduce a high level of uncertainty. This level of uncertainty can be reduced if the contractor can optimise the performance of his own organisation. This requires total command over all aspects of the project.

The European firms who were forced to underbid because of the intense competition, firmly believed that they had to have total control over the JV organisation in order to reduce the level of uncertainty and attain their project objectives. The European firms

equated equity control with total control over the activities of the venture. The local partner who had no experience in building railways gladly conceded the leadership and the equity control. Unfortunately as the time progressed, the work started to fall behind schedule. In order to overcome the potential delays, the European firms started making quick fix decisions without consulting their local partners. Such an attitude frustrated the local partners often resulting in failure of the JVs.

Killing (1983), in his study of the relationship between equity ownership and JV performance stipulated two conditions for the JVs with a dominant partner to succeed. First, the JV should be totally dependent on the dominant partner's technology, resources and or skills. Second, the other partner should be passive and leave the management and operation of the JV to the dominant partner.

A review of the activities of the JVs that were reported as failures (4 European-Local JVs and 2 NIC-Local JVs) shows that these two conditions were not met. While the local firms were dependent on the foreign firms' technology and managerial skills, they were not willing to remain as passive partners. They wanted their suggestions to be heard in the board meetings regarding the management of the project. The foreign firms felt that such interactions would be counter-productive. These differing perceptions often led to conflict and ultimately to failure.

The Japanese firms who were involved in six of the nine JVs that reported satisfactory JV performances, had a very relaxed attitude towards equity control. They were not too worried about making losses in their first projects. Their main interest was to establish a

good local image through helping their partners and their client achieve their respective key objectives. The Japanese did not believe that equity control is an essential pre-requisite for establishing control over the operations of the JVs. Moreover, since all the JVs were formed on a non-integrated basis there was also no real need to have total control on all the operations of the JV.

These discussions show that it is difficult to establish a direct relationship between equity control and JV performance. In other words, the nature of equity ownership alone cannot cause a JV to fail or succeed. It is the nature of the relationship that develops between the partners, over a period of time, that ultimately decides the JV performance. It can be concluded that hypothesis No.4 is not relevant to construction JVs.

Contribution of Technology and Other Resources

The foreign partners mainly contributed all technology related input to the joint ventures. The local partners were not particularly interested in acquiring the specialised technology such as underground shield tunnelling methods. In integrated style JVs, the foreign partners decided on the construction methods to be used for the projects and were readily accepted by the local partners. In the non-integrated style JVs the local partners and the foreign partners did not intervene with each others' selection of construction method.

Problems did arise between the two partners, especially in the integrated style JVs regarding appointment of project managers and other key personnel and sub-contractors. The human resources related issues are discussed in the following sections.

SECTION FIVE: PARTNER RELATED INTERACTIONS

Management Control

In all the three groups studied in this research, the key managerial positions were held by the expatriates appointed by the foreign partners. The local partners readily accepted this as they had no prior experience in railway work. The foreign partners considered this as very critical to their hold on the JV's management.

Discussions on Hypothesis 5:

"The performance of JV is enhanced when one partner exercises managerial control over the operation of the JV."

The foreign partner exercised control in all the JVs studied in this research. Out of the fifteen JVs studied, nine had satisfactory performances while six did not have. All the Japanese managed JVs performed satisfactorily. One of the main reasons for their success can be attributed to their management style. The Japanese Project Managers had years of experience with their parent firms and were well equipped to handle the international projects under their control. They tried to control only those areas they felt were critical to the success of the project. They provided enough leeway to the local partner to manage his own portion of work independently. They provided help whenever necessary to bring the local partner in line with his own firm's level of performance.

On the other hand, four out of the six JVs that reported unsatisfactory performance were managed by European managers. Some of the project managers were recruited fresh for the project by these firms. They were experts in their technical field but proved to be very poor in human relations. Some had to be replaced by the JVs on the insistence of local partners. Perhaps the most critical reason for failure was the insistence of the European firms to control all aspects of the JV, leaving very little role for the local partner to play.

Two out of three NIC-Local JVs reported poor performance. In the case of Koreans, they avoided contact with their local partner as much as possible. The client had to interact between the two partners to ensure schedule and quality standards were adequately met. The Hong Kong firm, managed by the British expatriates, behaved very much similar to the European firms and sought full control over the JV.

The results of the study are very much in line with that of Schaan (1983) who studied the relationship between JV performance and management control through an in-depth study of ten Mexican JVs. He noted that,"What managers in parent companies control and how they control has an impact on JV success" (p. iii).

These discussions show that hypothesis No.5 is only partly valid. These case studies have demonstrated that dominant management control can only succeed when the dominant partner gives adequate consideration to the needs and concerns of the other partner.

Need, Commitment and Inter-Partner Trust

The discussions on these three variables will be presented through the analysis of Hypothesis 6.

Discussions on Hypothesis 6:

" The performance of the JV is enhanced when the partners trust each other, have mutual need and commitment."

The local partners needed the foreign partners for improving their management skills and enhancing their local image. The foreign partners needed the locals mainly to take advantage of the preferential margin scheme. In all the cases studied, the foreign partners could have performed the tasks required by MRTC without any help from the locals. The foreigners needed the local partners' help only up to the award stage where as the local firms needed the foreign firms' assistance throughout the life of the JV. This difference in need can be narrowed only if there is a firm commitment from the foreign partner first to the JV and second to the partner.

The Japanese partners showed their firm commitment to the JV by ensuring that all activities of the project were properly planned and evaluated regularly. They further showed their commitment to the partner by training the local employees. This enabled the local partner to trust his Japanese counterpart and seek his advice when necessary. This show of commitment and the resultant trust considerably helped the partners to settle any

differences smoothly.

The European firms showed their commitment to the JVs but not to the partners' needs. Firms like Bocotra won their contract on the basis of preferential margin which required them to train the local partner's employees. But they failed to meet their commitments, thereby losing the trust of the local partners. The same can be said of Hyundai, who having won the contract as a JV, did very little to help its partner during the construction stage. Gammon (HK) lost the trust of its partner when it did not place Antarah-Koh's employees in the positions it promised to appoint them in the organisation. The performance of all these JVs were rated as poor.

These examples show that partner need, commitment and inter-partner trust are interrelated and are important requisites for good JV performance.

EFFECT OF COOPERATION AND/OR CONFLICT ON JV PERFORMANCE

Much of the research on JVs has centred around the impact of cooperation and conflict on JV performance. The common consensus is that conflict is inevitable in a JV as it takes two to make a decision. The conflict, in itself is not bad as long as a consensus emerges at the end. Such a favourable resolution cannot be achieved without inter-partner cooperation. But an ever increasing list of unresolved conflicts can be detrimental to the effective operation of the JV. This section analyses how the three groups of foreign firms approached the resolution of conflicts and the impact of conflict on the JV performance.

Discussions on Hypothesis 7:

"The performance of JV is adversely affected when the level of conflict increases."

All the JVs studied in the three case studies started with enthusiasm and a spirit of cooperation. But conflicts soon emerged over the following areas:

1. Achievement of key objectives
2. Staffing the organisation
3. Project priorities
4 Interaction between partners and
5 Interaction with the client

From the description of the cases, one can easily recognise that the European-Local JVs experienced a very high level of conflict. In these JVs, the partners experienced different sources of conflict during the life cycle of the JVs. In the early stages of the JV, the conflicts started with staffing the project organisation. This was a major issue in the JVs that operated on an integrated style. The foreign partners filled all the top positions and the locals were left with the semi-skilled positions to fill. In some JVs, the local partners described incidents in which foreign partners denied positions to their employees that were earlier promised.

The organisational problems eventually called into question the foreign partners' commitment to technology transfer. The local partners felt that the foreign partners were

not doing enough to help their staff to learn managerial skills. The European firms felt that technology transfer was not a contractual obligation and no budget was specifically provided for such purposes. They believed that the local staff lacked initiative in engaging their expatriate colleagues in giving them on-the-job training. Both the parties did not make any extra efforts to resolve such thorny and fundamental issues. These unresolved conflicts manifested into the eventual failure of the JV.

The conflicts between the partners can be summarised as below:

- lack of clear understanding of project objectives
- ambiguity over specific roles of the partners
- lack of perceived relationships between JV's overall objectives and partner's own individual objectives

The intensity of conflict between the partners was low when the partners adopted non-integrated style JVs. This is due to limited day to day contact between the partners. Even in this style, the Korean-Local JV reported unsatisfactory performance mainly due to the Korean's reluctance to provide technology transfer to the locals. In this aspect, the Japanese cooperated with their local partners and helped them achieve their goals. Such a cooperative attitude improved the overall performance of these ventures.

These cases provide clear evidence that conflicts that were not resolved to the satisfaction of all the parties adversely affect JV performance and that cooperation helps to improve JV performance. It can also be observed in all the case studies that the local firms had more conflict with Europeans than with the Japanese firms. This can possibly be traced

to cultural differences. The next section explores the influence of culture on JV performance.

INFLUENCE OF CULTURE ON JOINT VENTURE PERFORMANCE

The discussions on the influence of culture is presented as part of testing the validity of hypothesis on cultural issues.

Discussions on Hypothesis 8:

"JVs formed between partners with similar cultural attributes are likely to perform better than JVs formed between partners coming from diverse cultural backgrounds."

Hoftstede's model on culture was extensively used in the earlier chapters to bring out the influence of culture on the interactions between partners. These discussions showed that when cultural distances are larger, it requires more effort to negotiate and build understandings between the partners. The relationship between cultural distance between partners and the efforts needed to close the cultural gap is depicted in Figure 8.1. As the figure shows, when the cultural distances are larger, there will be more contrasts in the working habits of the partnering firms and hence will require more effort to understand each others' requirements.

Unfortunately, the European-Local JVs who had the largest cultural distance among the three groups neither had the time nor made the effort to close the cultural gap during their

short period of association. Some of the cultural problems the European firms and the locals experienced can be also be traced to the integrated structure of the JV organisation. The integrated structure calls for cross-cultural teamwork. Such teamwork is not possible if the partners do not share the same assumptions (Lewis, 1990). He also observed that beyond some cultural distance, partner's differences simply overwhelm their ability to accept and understand each other (Figure 8.1 represents this view). It is possible that the European-Local JVs fall into this category.

The Japanese were successful JV partners perhaps because they managed to reduce cultural conflict through limiting the number of cross-cultural contacts by adapting the non-integrated style of JV. It can also be observed in Figure 8.1 that non-integrated style requires only minimum efforts from the partners to overcome cultural challenges.

The validity of this hypothesis can be further explained through the diagram developed by Thomas (1976). Figure 8.2 shows the relationship between two important dimensions of conflict: assertiveness and cooperativeness. In cultural terms, cultures that are assertive in nature are individualistic, highly competitive, want to limit uncertainty and believe in using power and generally uncooperative. The cooperative cultures in general are collective, relationship oriented, tolerant of uncertainty, and relate to low use of power (Swierczek,1994). Swierczek suggests that conflict between firms participating in a JV will be minimal if they belong to collaborative or smoothing styles.

Based on their cultural orientations, only the Japanese and the Singaporeans belong to these styles (Fig. 8.2) and naturally got along with each other very well. The Koreans,

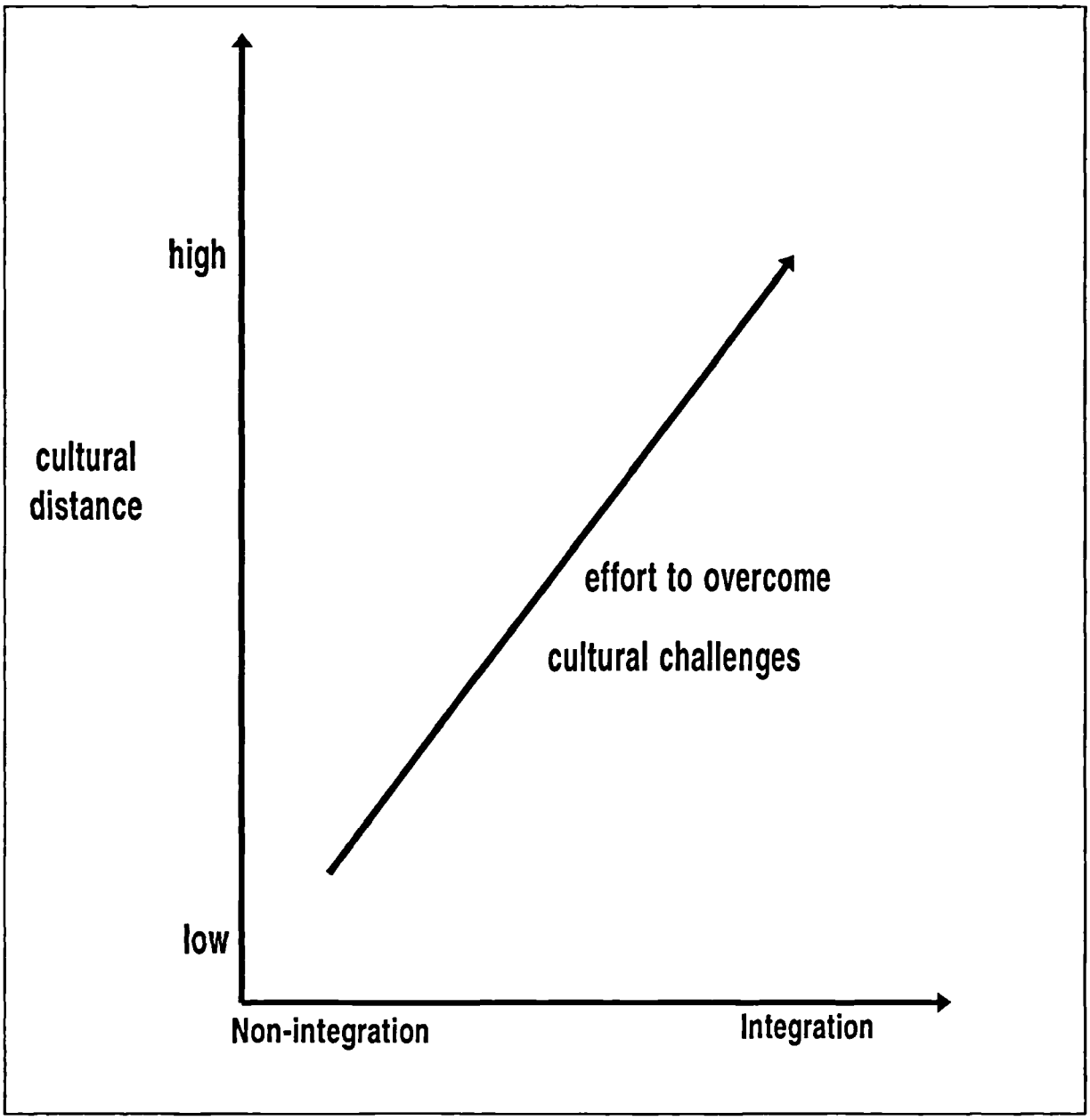

Figure 8.1: Cultural Distance and JV options

Source: J.D. Lewis, " Partnership for Profit".

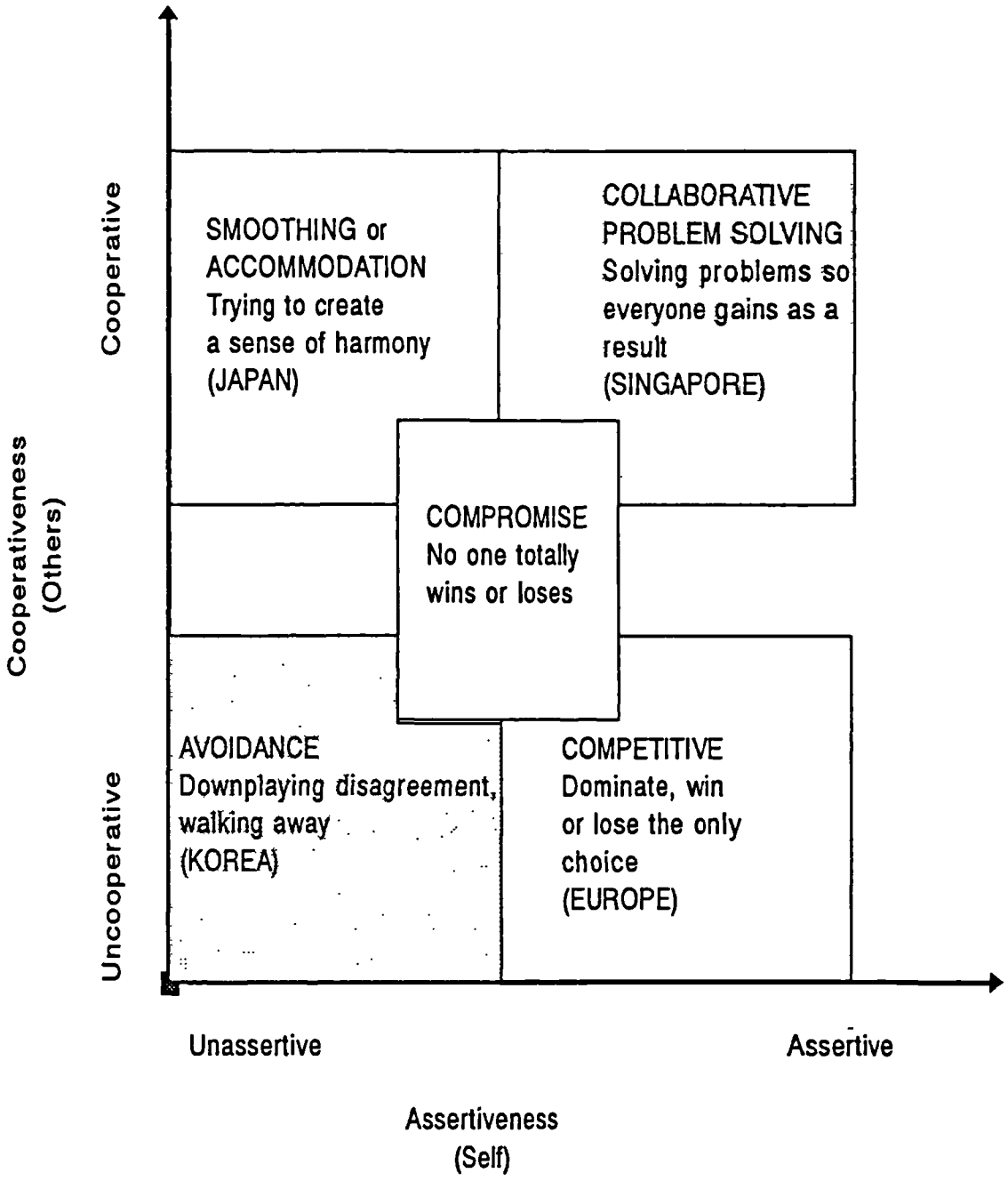

Figure 8.2 Cultural influences and conflict-management styles
(adapted from Swierczek, 1994)

who belonged to the avoidance style, and the Europeans, who belonged to the competitive style, are by nature uncooperative and hence had increased level of conflict with the Singaporeans. An increased level of conflict reduces performance and hence the JVs formed between Singaporean firms with Korean or Europeans firms, did not perform satisfactorily.

The above discussions fully support the hypothesis that JVs formed between partners coming from similar cultures are likely to perform better than those between diverse cultures.

FINAL NOTE ON THE INFLUENCE OF CULTURE ON INTER-PARTNER RELATIONS

Hofstede (1983) defined culture as collective mental programming. He opined that the national culture which takes decades to develop, is unique for each nation and is the most difficult one to change. The firms that join together in an alliance such as a JV, bring with them, their own unique national and corporate cultures to the JV. The influence of culture is not visible till one firm's assumptions are challenged. The reaction to that challenge is significantly influenced by the underlying culture of the responding firm. Culture manifests its presence through the nature of interactions between the partners.

The discussions presented in this chapter have demonstrated, through examples, that the underlying root cause of problems and misunderstanding between the partners is their cultural differences. As a concluding note to this chapter, a summary of the cultural

characteristics that were found to influence the behaviour of European and Japanese firms in this research study is presented in Table 8.4. The researcher was unable to identify from these cases, a unique set of cultural characteristics that can be specified as NIC culture.

TABLE 8.4

CULTURAL VALUES THAT INFLUENCED THE BEHAVIOUR OF EUROPEAN AND JAPANESE FIRMS

European Culture	Japanese Culture
Short-term goals. Focus on immediate results	Long-term goals. Focus on image, market share
Believes in total control. Strong uncertainty avoidance	Believes in selective control. Manage uncertainty
Focus on rules than on relationship. No room for compromise.	Relationship before rules. Room for accommodation
Show immediate reaction to opposing views with public display of emotion.	Subtle ways of expressing disagreement. No public display of emotions.
Confront openly over disagreements.	Seek compromise privately. Settle issues amicably to save "public face". Seek harmony.

CHAPTER 9

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The main purpose of this chapter is twofold: (1) to provide a broad overview of the research problem, results and findings; and (2) to explore the implications of the findings. This chapter is divided into six sections. A brief outline of the research problem and its significance is presented in the first section. In the second section, the research method and data collection methodology are described. Third section presents a summary of major findings. The fourth section presents the main contribution of this study to JV literature and make recommendations for the foreign and local firms who may be interested in forming international construction JVs. The fifth section indicates the limitations of the study and the last section delineates the future area of study.

RESEARCH PROBLEM AND ITS SIGNIFICANCE

Research Problem

International construction JVs are formed by partnering firms to complete specific tasks and to operate for a limited period. Not all of them succeed in achieving the intended objectives. What makes them succeed or fail has not been seriously dealt with by past and current researchers. The JV literature on manufacturing and service industries have suggested that variables such as partner selection, need, commitment, conflict, control and cultural differences influence the performance of JVs. The present study focuses on determining the relevance and applicability of these factors in influencing the performance of construction JVs. Using a case study approach, this study identifies several

key factors that influence the performance of construction JVs.

Significance of the study

The seventies and eighties saw a significant growth in the number of international construction firms searching for new work in the emerging economies. This trend has continued so far in this decade and the newly industrialising economies of East Asia are offering exciting new opportunities to these firms, through JVs with local firms, in the area of infrastructure development.

An international construction JV is a temporary organisation subject to joint management. Like any other temporary organisation, it is unstable. The relationship between the partners is subject to further strain by other participants in the project. The list includes clients, consultants, government regulatory authorities and fellow competitors. The list of failed JVs reported in the JV literature attests to the difficult challenges that face these ventures. But the literature also reports that failure is costly and frustrating. In view of the increased use of JVs by host governments, local and international firms, on the one hand, and the high failure rate, on the other, one cannot overstate the need for a comprehensive study to identify the key determinants that influence the performance of JVs either adversely or favourably.

SUMMARY OF RESEARCH METHOD

Due to a dearth of literature available related to construction JVs, the present researcher

did an extensive review of literature written on manufacturing JVs. This search enabled the identification of the key factors that influence the performance of JVs. Concurrent with the search of literature, a research model was developed to provide a framework for analysing the JVs. Based on the research model and available literature eight hypotheses were developed.

Considering the complexity of relationships among the participants in the JV process, it was decided to use the case study approach to further explore the inter-relationship between the variables. This method is found to be superior to statistical methods which study the inter-relationship between variables at a given point in time. JV relationships are much more complex and the pattern of relationship evolve and change throughout the life of the JV.

The Singapore Mass Rapid Transit project was chosen as the case study project for this research for the following reasons. First, it is one of the first infrastructure mega projects built in this region. Second, the client awarded the contracts mainly to JVs (25 out of 38). Third, the participating contractors belonged to different nationalities and could be grouped according to their cultural orientation. This provided an opportunity to study the influence of culture on JV performance. (This has often been a neglected issue in earlier works). Fourth, all the contractors were subject to same conditions of contract and worked in the same geographical area during the same period (1984-89). Most importantly, the rules and regulations of Singapore government applied equally to all contractors.

The data for the case studies was collected from several sources. The MRT archives were used to collect the basic facts on all the JVs. The information on interaction between partners was collected through interviews with the executives of the parent firms, questionnaire, and reports in local journals and news papers. The opinion of the managers of the client were also sought to get independent assessment on the performance of the JVs. The actual case studies are presented in Chapters 5 to 7 and the analysis in Chapter 8.

SUMMARY OF FINDINGS

Several important findings come out of this study. They are presented in the same order as the eight hypotheses tested in the previous chapter. The main focus of this presentation is to highlight the key issues that determine the outcome of the association between the JV partners.

Motivations for Forming JVs

The European and NIC firms were primarily interested in forming the JV with locals to improve their chances of winning a MRT contract by utilising the government incentives. In most cases the proposed association was for a specific project. The Japanese firms were motivated to form JVs with the locals for two reasons. First, to match competition and second, to improve the market share in the long term through enhanced local image. In the order of importance, access to local markets, the need to develop a local image and maintaining or improving the global market share are the primary motives for all foreign

firms to seek a local partner.

The local firms engaged in the JVs were mainly interested in acquiring technology and management skills through their association with foreign firms. The local firms were hoping that by providing access to the local market through the JV, the foreign firms would show their appreciation by transferring appropriate technology and skills. The case studies show that the JVs that succeeded are those in which the foreign partners adequately addressed this particular need of the local partners (Hypothesis No 1).

Partner Selection

The European and NIC firms did not employ any specific partner selection process to choose local partners. The Japanese were careful in their screening and selection of local partners. The results show that the Japanese-Local firms did well as partners and careful partner selection could be a reason for such an outcome (Hypothesis No.2). The results also show that JVs in which partners were selected on the basis of favourable past association perform well (Hypothesis No.3).

JV Agreements

The European firms preferred detailed contracts that can be used as the guideline for every activity of the JV. These documents addressed all the needs of the European firms and very little of the local partners' needs. This proved to be an area of major conflict between the partner. The Japanese and Koreans preferred short contract documents. The

Japanese relied on mutual trust and verbal agreements to resolve all differences. These preferences for a particular style of agreement can be part of the cultural attributes of the respective nationalities.

JV Organisation

The Europeans preferred integrated style JVs in which all employees of the parent companies are seconded to the JV. All work is performed under one manager and the profits or losses shared according to respective equity contributions. European firms used this arrangement in order to have total control over the operation of the JVs. The results show that this did not work out well as the Europeans were insensitive to local firms' suggestions and demands for meaningful participation.

The Japanese and Koreans organised the JVs in the non-integrated style. In this style, the project work is divided into independent work packages and allotted to each partner. These firms preferred this arrangement as it minimised contact and thereby conflict. This arrangement worked well for the Japanese because they helped their partners in completing their tasks. It did not work well for the Koreans because they struck to the rules of the contract and provided little help to their partners.

The results of the study show that the choice of the organisational style and subsequent actions during the JV operations is part of foreign firms' national culture.

Equity Control

The results of the study show that there is no direct relationship between equity control and JV performance. The European firms who preferred majority equity ownership did not do well. The Japanese who generally preferred sharing the equity ownership did perform well. The researcher is of the opinion that the positive results have more to do with inter-partner relationship than the level of equity ownership (Hypothesis No.4).

Management Control

The case studies show that selective control over critical activities by the senior partner is preferable to total control. This is the style adopted by the Japanese. The Europeans who preferred total control or the Koreans who did not exercise any control, did not do well (Hypothesis No.5).

Need, Commitment and Trust

The case studies show that of the three, commitment and trust are important variables. The European firms had very little need for the local partner, did show commitment to the venture and not to the partner. There was also no evidence of any mutual trust. These factors contributed to the failure of European-Local JVs. The Japanese firms showed total commitment to the venture and to the partner. The local partner showed his total trust in his senior partner by listening to his suggestions. These created a conducive atmosphere for making joint decisions and contributed to the eventual success of the JVs (Hypothesis No. 6)

Cooperation and/or Conflict

The European firms in general had more conflicts with their partners than the Japanese firms. The conflicts were primarily due to lack of clear understanding of objectives, lack of trust and ambiguity over each partner's role in the JV. The JVs who used integrated JV structure reported more conflict than the JVs that used non-integrated structure. The cases clearly demonstrated that conflicts reduce performance and cooperation improves JV performance (Hypothesis No.7).

Cultural Differences

The cases studied in this research showed that cultural differences is one of the primary source of failure of JVs. The study also showed that the larger the cultural distance between partners, the greater will be the efforts needed to overcome the differences. These cases demonstrated that integrated structure may not be suitable for firms with a large cultural gap (Hypothesis No.8).

SOME CONTRIBUTIONS OF THE STUDY

Exploratory Contribution

The study provides a framework for JV analysis through the research model by indicating the linkages between various determinants of JV performance and JV performance itself. Such a framework should be useful for better understanding of JVs.

Confirmatory Contribution

This study provides confirmatory evidence that many of the factors that influenced the performance of JVs in the manufacturing and services sectors are equally applicable to construction JVs.

The most significant contributions of this study is to stress the need for understanding the important influence of partner related variables on JV performance in general and that of cultural differences in particular.

RECOMMENDATIONS

Recommendations to Foreign Firms

The framework for analysis developed in this study provides a good starting point for foreign firms who are interested in exploring the opportunities for forming JVs with local firms as a strategy to enter new construction markets or consolidate and improve their existing market share in a particular country. Apart from the model, some valuable guidelines for the international firms can be developed, based on the observations made from the case studies derived from the Mass Rapid Transit Project. The key recommendations are presented below. The scope of recommendations made is limited to issues related to formation and operation of international joint ventures. It does not take into account legal or financial considerations.

International construction firms, desirous of using JV as a vehicle for entry into a new market, should evaluate the cultural gap that exists between their nation and the host nation. Foreign firms who consider the gap to be too large should seriously consider other alternative routes of entry such as opening a fully owned subsidiary, licensing arrangements and through sub-contracting arrangements.

Having decided to use JV arrangement as a mode of entry the foreign firms should go through a former partner screening process to identify partners with potential fit. Some of the important considerations in partner selection process should include, strategic compatibility, complementary skills and resources, relative company size, mutual need and commitment and national and corporate cultural fit (Williams & Lilly, 1993). The temptation to select a partner just to fulfil an immediate and short-term need without going through a formal screening process should be avoided at all costs.

The first step in negotiating an agreement should be the identification and open discussion of each partner's individual objectives in forming the joint venture. Differences emerging during this process should be carefully evaluated and resolved before the signing the agreement. The larger the cultural distance, the more time will it take to resolve the identified differences.

This study has shown that non-integrated style of joint venture is better suited for partners who have a large cultural distance to overcome. This limits the number of contacts between the two partners. But this style of venture will not help a local partner who is ambitious and who wants to learn from his partner unless there is a separate clause in the

agreement that makes specific reference to technology transfer.

Integrated style of joint venture is suited to partners who have similar cultural backgrounds. This arrangement is conducive for effective technology transfer to take place. If technology transfer is an expected outcome of the formation of the joint venture, then the procedure for such a transfer should be clearly identified and included in the joint venture agreement.

The early period in the life of the joint venture should be used to build trust between the partners. This can be achieved by acknowledging that both partners gain from the relationship and by developing mutual respect. Partners should be honest and promise only what can be delivered.

The lines of communications should always be kept open. Unilateral decisions should be avoided by recognising that most effective decisions are made jointly.

It is important to recognise the distinction between policy decisions and operating decisions. The policy decisions should be taken jointly at the board level while the operating decisions, taken within limits, be made at the project level (Andrews, 1965).

The appointment of a responsible Project Manager is very crucial to the success of the project. Ideally the person who takes over the role of the project manager should have participated in negotiating joint venture terms and structure. If this is not possible, he should take time to review the objectives of both partners. It is important for him to

recognise that he is the Project Manager of the venture and not a representative of his parent firm. Conflicts among partners, external forces, and lack of sufficient resources to do the job can make joint venture management extremely difficult. In order to overcome these challenges he needs the skills of a coach, diplomat and a communicator. Expert technical knowledge in his specialised field alone is not good enough.

Cultural differences are bound to exist in international JVs. Every effort should be directed at narrowing the cultural gap. Expatriate staff appointed to the venture should be provided with cross-cultural training before they are sent to the host country. Orientation programmes for the families will also help.

Overcoming cultural differences alone cannot assure the success of the joint venture. But it will surely help the partners to work together as a team in attaining their common and individual objectives set out when forming the joint venture.

Recommendations to Local Firms

The framework for analysis is equally applicable to local firms. They should be very clear in outlining their priorities to the foreign firms who may be interested in forming JVs with them. If the local firms expect technology transfer as an expected outcome they should ensure that their requirements are addressed through a separate technology transfer agreement as part of the overall JV agreement. This agreement should specify the type of technology to be transferred,the mode of transfer and the amount to be reimbursed for effecting the transfer.

The local partner should ensure that the organisation structure of the JV is conducive to effecting technology transfer. The local partner should ensure that specific positions in the organisation are designated for receiving technology transfer. These positions should be filled by capable learners.

Cross-cultural training is equally applicable to the employees of local partners. Employees identified to receive training should be provided with appropriate foreign language training.

SOME LIMITATIONS OF THE STUDY

The results of the study should be viewed in the light of following limitations:

1. The results derived from case studies do not lend themselves to statistical verification and hence are not empirically reliable. This is because of the subjective and flexible nature of the case study methods. Conclusions are drawn from observations and the bias of the observer is inherent in the results.

2. One has to be very careful in generalising the conclusions derived from this study due to the limited number of cases observed. The case studies included in this research are all from one single project.

3. The JV performances in these cases are assessed only by the local partners. It may be desirable, to elicit the opinions of the foreign partners and compare the results.

AREAS OF FUTURE RESEARCH

The scope for future research is unlimited as the existing body of literature on construction JVs is very small. This study can be replicated in other countries in order to reinforce the relevance and applicability of the findings of the research to other parts of the world.

This study covers only JVs between local and foreign contractors. Similar studies can be conducted to study the factors affecting the performance of JVs between consultants and JVs formed exclusively among local contractors.

Research study is also needed to compare the performance of JVs in one region with that of JVs in another region. For example, the researcher can find out how different are the management and operational styles of JVs in East Asia and European community.

Globalisation is becoming popular among international construction firms. What role do JVs play in this evolving process can be the scope of an exploratory study.

Finally it is hoped that this study would encourage fellow researchers to further research and add to the body of knowledge on construction joint ventures.

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APPENDICES

Appendix A

RESEARCH QUESTIONNAIRE

Determinants of Joint Venture Performance in the Construction Industry: Cases from Mass Rapid Transit Corporation of S ngapore

Please respond to the following questions on the basis your company's involvement and experience as an International Joint Venture Partner in building the Singapore Mass Rapid Transit Project.

Govindan Sridharan

Ph.D Student

University College, London

SECTION A

GENERAL INFORMATION

1. Name of interviewee :

2. Designation :

3. Experience : i) In the Construction Industry ---- years

   ii) In Managing Joint Ventures ---- years

4. Name of Joint Venture :

5. What is the equity distribution?

   a. your company ____% b. partner : _____%

SECTION B

OBJECTIVES

1. How important are the following factors in your decision to set up the JV? Please circle the number that best describes the importance of each factors in your decision.

	Not Important		Somewhat Important			Very Important	
a. Spread Commercial risk	1	2	3	4	5	6	7
b. Obtain Technology transfer	1	2	3	4	5	6	7
c. Government incentives	1	2	3	4	5	6	7
d. Match competition	1	2	3	4	5	6	7
e. Enhance local image	1	2	3	4	5	6	7
f. Avail of partner's local knowledge	1	2	3	4	5	6	7
g. Market diversification	1	2	3	4	5	6	7
h. Access to new financial resources	1	2	3	4	5	6	7
i. Match competition strategies	1	2	3	4	5	6	7
j. Protect international market share	1	2	3	4	5	6	7
k. Avoid take over	1	2	3	4	5	6	7
l. Hedging against discrimination by host country	1	2	3	4	5	6	7
m. Pooling of resources	1	2	3	4	5	6	7

SECTION C

SELECTION OF JOINT VENTURE PARTNERS

1. Please indicate the importance of following factors in the selection of your partner.

	Not Important		Somewhat Important			Very Important	
a. Plant and Equipment	1	2	3	4	5	6	7
b. Size/reputation	1	2	3	4	5	6	7
c. Government link	1	2	3	4	5	6	7
d. Technology	1	2	3	4	5	6	7
e. Finance	1	2	3	4	5	6	7
f. Construction resources	1	2	3	4	5	6	7
g. Local knowledge	1	2	3	4	5	6	7
h. Management skills	1	2	3	4	5	6	7
i. Access to materials/supplies	1	2	3	4	5	6	7
j. Nationality of potential partner	1	2	3	4	5	6	7

2. Who made the first approach or suggestion regarding the joint venture.

   a. your company ( ) b. year : _____

   b. your partner ( ) b. year : _____

   c. other parties (please specify) : _____

3. How long did you negotiate with your partner before the joint Venture was formed. Please circle the period below:

   a. less than 3 months

   b. 3 - 6 months

   c. 6 - 12 months

   d. 1 - 2 years

   e. 2 - 3 years

   f. 3 - 4 years

   g. more than 4 years

4. Were the negotiation longer/shorter than or normal for your company?

   a. longer ( ) b. shorter ( ) c. normal ( )

5. Were there other potential partners

a. yes ( ) b. No ( )

If yes how many : _____

7. To what extent did you negotiate with the other potential partners

1 2 3 4 5 6 7
did not some what extensively

8. Could your company have undertaken this project without a partner?

1 2 3 4 5 6 7
no may be yes

9. Total number of JVs your Company is currently engaged in:

a. Singapore : _____

b. Outside Singapore : _____

SECTION D

CONTROL

This section contains statements and questions about the operations and management of the joint venture. Please circle the most appropriate response.

1. Please indicate to what extent your partner exercises control over the following functions.
(1 = extremely low, 2 = very low, 3 = low, 4 = average,
5 = high, 6 = very high, 7 = extremely high)

Strategic Control

a. Selection of members to joint venture board	1	2	3	4	5	6	7
b. Appointment of project manager	1	2	3	4	5	6	7
c. Organisational structure	1	2	3	4	5	6	7
d. Financing	1	2	3	4	5	6	7
e. Selection of Sub contractor/Supplier	1	2	3	4	5	6	7
f. Methods of dispute settlement	1	2	3	4	5	6	7

Managerial Control

a. Capital expenditure	1	2	3	4	5	6	7
b. Budget control policy	1	2	3	4	5	6	7
c. Appointment of key personnel	1	2	3	4	5	6	7

d. Accounting/Administration	1	2	3	4	5	6	7
Operational Control							
a. Construction method	1	2	3	4	5	6	7
b. Planning	1	2	3	4	5	6	7
c. Purchase of materials	1	2	3	4	5	6	7
d. Site supervision	1	2	3	4	5	6	7
e. Quality control	1	2	3	4	5	6	7
f. Selection and promotion of site personnel	1	2	3	4	5	6	7
g. Site safety/security	1	2	3	4	5	6	7
h. Reporting procedures	1	2	3	4	5	6	7

SECTION E

MUTUAL CONTRIBUTION OF RESOURCES

Allocate 100 points between you and your partner to indicate the relative extent to which each contributed resources to the venture.

	Resource contributions	
Description of Resources	you	your partner
Project Manager		
Key Project Personnel		
Field Staff		
Administration and Personnel		
Plant and Equipment		
Materials		
Financing		

SECTION F

Conflict

This section contains statement that best described the nature of your relationship with your partner. Please indicate the level of agreement or disagreement. You had with your partner over the following issues. 1 = disagreement, 2 = very rarely disagreed, 3 = rarely disagreed, 4 = sometimes disagreed, 5 = often disagreed, 6 = very often disagreed, 7 = almost always disagreed)

a.	Organisational issues	1	2	3	4	5	6	7
b.	Technology transfer	1	2	3	4	5	6	7
c.	Selection of sub-contractor	1	2	3	4	5	6	7
d.	Procurement of Materials, Plant and Equipment	1	2	3	4	5	6	7
e.	Interpretation of JV agreement	1	2	3	4	5	6	7
f.	Choice of construction methods	1	2	3	4	5	6	7
g.	Financial issues	1	2	3	4	5	6	7
h.	Administrative procedures	1	2	3	4	5	6	7
2.	Cultural Issues							
a.	Sensitivity to partner's needs	1	2	3	4	5	6	7
b.	Interaction among partners	1	2	3	4	5	6	7
c.	Interaction with client	1	2	3	4	5	6	7
d.	Behaviour of expatriate managers	1	2	3	4	5	6	7
e.	Language/Communication B	1	2	3	4	5	6	7

SECTION G

ASSESSMENT OF JOINT VENTURE PERFORMANCE

This section contains the objectives you may intended to achieve through the joint venture. Please indicate by circling to appropriate circle the extent to which you achieved these objectives (1 = not at all, 2 - very low, 3 = low, 4 = average, 50 = above average, 6 = high, 7 = very high)

	Not Important		Somewhat Important			Very Important	
a. Spread Commercial risk	1	2	3	4	5	6	7
b. Obtain Technology transfer	1	2	3	4	5	6	7
c. Government incentives	1	2	3	4	5	6	7
d. Match competition	1	2	3	4	5	6	7
e. Enhance local image	1	2	3	4	5	6	7
f. Avail of partner's local knowledge	1	2	3	4	5	6	7
g. Market diversification	1	2	3	4	5	6	7
h. Access to new financial resources	1	2	3	4	5	6	7
i. Match competition strategies	1	2	3	4	5	6	7
j. Protect international market share	1	2	3	4	5	6	7
k. Avoid take over	1	2	3	4	5	6	7
l. Tax implication	1	2	3	4	5	6	7
m. Hedging against discrimination by host country	1	2	3	4	5	6	7
n. Pooling of resources	1	2	3	4	5	6	7

Please indicate the overall level of satisfaction of your firm with the performance of the JV
Satisfactory ( ) Not Satisfactory ( )

Please indicate whether you intend to continue your association with the partner in the future.

Yes ( ) May be ( ) Never ( )

Thank-you for your sparing me your valuable time.

G.Sridharan
University College, London

PREFERENTIAL MARGIN FOR CIVIL CONTRACTS

Please lodge a specific request to be included with your Tender for Contract _____ if your Joint Venture wishes the Corporation to consider applying the preferential margin scheme to the tenders to be submitted by your Joint Venture.

For the purpose of implementing the preferential margin scheme for tender assessment and contract award, we require from your company -

(1) a Certificate from your Auditor who shall be a registered Public Accountant as to the level of local equity participation in your joint venture at the time of submission of tender.

(2) information printouts of each member of the joint venture from the Registry of Companies and Businesses.

(3) a Certificate from the Construction Industry Development Board (CIDB) granting approval for the preferential margin scheme to be implemented in respect of your tender.

The application for this Certificate shall be made directly by hand to CIDB at the following address at least three weeks before the close of tender -

Construction Industry Development Board
133 Cecil Street #09-01/02
Keck Seng Tower
Singapore 0106

The Certificate from the Auditor shall be provided in accordance with the specimen form attached hereto (Annex A). The scale of preferential margin shall be considered in relation to the net local equity participation as indicated below:

Net Local Equity Participation	Preferential Margin
50% or more	5% subject to a maximum of $5 million
40% or more but less than 50%	4% subject to a maximum of $4 million
30% or more but less than 40%	3% subject to a maximum of $3 million
25% or more but less than 30%	2.5% subject to a maximum of $2.5 million
Less than 25%	No preference

For the purpose of calculating the local net equity participation, the following illustration is given as a guide:

Joint Venture Limited tenders for MRT Civil Works as joint venture of local and foreign companies. The percentage of participation in the joint venture by the local company is 40%. If the local company is 80% owned by local citizens and permanent residents, then the net local participation of the joint venture shall be 0.80 x 40%, that is, 32%. The preference to be given to the joint venture shall be 3% of the

acceptable Tender Price subject to a maximum of $3 million.

Please also submit, together with your tender, a detailed identification of the participation by the local Joint Venture partner or partners. Essentially, the Corporation requires information of your project organisation. The organisation should reflect project control and administration. This may be done in a form of an organisational chart and it is essential that the chart should reflect the following areas of responsibility:-

i. Overall Project Management
ii. Design
iii. Site Management
iv. Programming
v. Budgetary Control
vi. Contract Administration

The level of staffing to be provided by the local partner over the contract period together with a general indication of the nature of work of the various key personnel to be deployed must also be indicated.

Your detailed proposals for technology transfer should also be submitted for consideration.

Very truly yours,
Mass Rapid Transit Corporation

APPENDIX C

PRE QUALIFIED TENDERERS FOR MRTC CONTRACTS

Contractor No	Name	Type of Bid	Nationality
C101			
1.	Aoki Lim Kah Ngam	JV	Japan Singapore
2.	Paul Y	S	Hong Kong
3.	Henry Boot Keppel Shipyard	JV	UK Singapore
4.	Daewoo	S	Korea
5.	RSEA Hock Lian Seng	JV	Taiwan Singapore
6.	Nishimatsu Lum Chang	JV	Japan Singapore
7.	Lee Kim Tah Societe Generale D'Enterprise	JV	Singapore France
8.	George Wimpey Sembawang Construction	JV	UK Singapore
9.	Ohbayashi-Gumi Koon Construction	JV	Japan Singapore
C102			
1.	Volker Stevin Civil Engineering	S	
2.	Citra Construction SPIE-Batignolle Active Building & Civil Construction	JV	Australia Italy Singapore
3.	Hyundai Engineering	S	Korea
4.	Aoki Lim Kah Ngam	JV	Japan Singapore
5.	Paul Y	S	Hong Kong
6.	Gammon (HK) Reliance Contractors	JV	Hong Kong Singapore
7.	BES Engineering Singa Development	JV	UK Singapore
8.	RSEA Hock Lian Seng	JV	Taiwan Singapore
9.	Dragages Et Travaux Publics	JV	France
10.	Fairclough Intl Construction Fletcher Construction Marples Ridgway Contractors	JV	UK USA Singapore
11.	Dyckerhoff & Widmann Ag Neo Corporation Spa Construction Metrobilt Construction	JV	Germany Singapore " "

12.	Leighton Contractors	S	Austrlia
13.	Kumagai Gumi Co	JV	Japan
	RDC		Singapore
C103			
1	Interbeton	JV	
	Edmund Nuttall		
2.	Compagnie Francois D' Enterprise	JV	Belgium
	Franki		"
	Eng Hup Heng Construction		Singapore
	Evergreat Construction		"
	Hock Chuan Ann Construction		"
	Job Associates		"
	Tan Gim Huat Construction		"
3.	Daewoo	S	Korea
4.	Paul Y	S	Hong Kong
5.	Fougerolle	JV	France
	Reliance Contractors		Singapore
	Antara Koh		"
	Chartered Project Management		"
6.	Philipp Holzman Aktiengessellschaft	JV	Germany
	Low Keng Huat Construction		Singapore
7.	Dillingham Construction	JV	USA
	Metrobilt Construction		Singapore
	Neo Corporation		"
	SPA Construction		"
8.	RSEA	S	Taiwan
C104			
1.	Tokishima Corporation	JV	Japan
	Takenaka Komuten		"
	Takenaka Doboku		"
2.	Maeda Construction	S	
3.	Lee Kim Tah	JV	Singapore
	Bilfinger & Berger		Germany
	Alfred Kunz		Germany
	SGE		France
4.	S & M Contractors Inc.	JV	Singapore
	Keang Nam Ent.		"
	Metrobilt Construction		"
	Ong Chwee Kou		"
	Mancini Construction		Italy
5.	Dragages et Travaux	JV	France
	Sheridan Construction		UK
	Sembawang Shipyard		Singapore
	Bored Piling		"
	Tiong Seng Construction		"
6	Aoki	JV	Japan
	Lim Kah Ngam		Singapore

C105

1.	Borie SA	JV	Italy
	Cogerar SPA		France
	Traylor Bros		USA
	Ong Chwee Kou		Singapore
2.	Ohbayashi-Gumi	JV	Japan
	Okumura Corporation		"
3.	Nishimatsu Construction	JV	Japan
	Oh Teck Thye		Singapore
4.	Dragados Y Constructiones	S	Spain
5.	Kumagai Gumi	JV	Japan
	RDC		Singapore
6.	BES Engineering	JV	Korea
	Daiho Construction		
	Tai & Son		
7.	Dumez Travaux Publics	S	

C106

1.	Hazama-Gumi	JV	Japan
	Japan Dev Construction		
2.	Sambu Construction	S	Korea
3.	Sato Kogyo Co	S	Japan
4.	S & M Contractors	JV	Singapore
	Keang Nam Entr.		"
	Metrobilt Construction		"
	Ong Chwee Kou		"
	Mancini Construction		Italy
5.	Kumagai Gumi	JV	Japan
	RDC		Singapore
6.	Interbeton BV	JV	
	Edmund Nuttall		
7.	Campenon Bernard	JV	France
	Singapore Piling & Civil Engineering		Singapore

C107

1.	Maeda Construction	S	Korea
2.	Lee Kim Tah	JV	Singapore
	Bilfinger & Berger		USA
	Alfred Kunz		Austria
	Societe Generale D Entre		France
3.	Borie SAE	JV	Italy
	Cogerar SPA		France
	Traylor Bros		USA
	Ong Chwee Kou		Singapore
4.	Hochtief AG	JV	Germany
	Gammon (HK)		
	AB Skanska		

5.	Nishimatsu Construction Oh Teck Thye	JV	Japan Singapore
6.	Marubeni Corporation Shimizu Construction Taisei Corporation	JV	Japan
7.	Kajima Corporation Keppel Shipyard	JV	Japan Singapore
8.	Fairclough International Constrn Fletcher Construction Lum Chang Building Construction Marpels Ridgway Construction	JV	USA Singapore
9.	Hyundai Engineering	S	Korea

C108

1.	Hochtief AG Gammon (HK) AB Skanska	JV	Germany
2.	Kajima Corporation Keppel Shipyard	JV	Japan Singapore
3.	Marubeni Corporation Shimizu Construction Taisei Corporation	JV	Japan
4.	Sambu Construction	S	Korea
5.	Tobishima Corporation Takenaka Komuten Takenaka Doboku	JV	Japan
6.	Wayss & Freytag Samsung Construction International Bechtel	JV	Germany Korea USA

C109

1.	Aoki Lim Kah Ngam	JV	Japan Singapore
2.	Cementation International Trafalgar House Engineering	JV	UK
3.	Daewoo	S	Korea
4.	Dragages et Travaux Sheridan Construction (Overseas) Sembawang Shipyard Bored Piling Tiong Seng Construction	JV	France UK Singapore " "
5.	Dyckerhoff & Widmann Lian Hup Granite SPA Construction	JV	Germany Singapore "
6.	Ohbayashi-Gumi Okumura Corporation	JV	Japan
7.	Paul Y	S	Hong Kong

8.	Sato Kogyo Co Ltd	S	Japan
9.	Wayss & Freytag	JV	Germany
	Samsung Construction		Korea
	International Bechtel		USA

C103A

1.	Maeda Construction	S	
2.	Tobishima Corporation	JV	Japan
	Takenaka Komuten		
	Takenaka Dobuku		
3	Compagnie Francois D'Enterprise	JV	France
	Franki		"
	Eng Hup Heng Constrn		Singapore
	Evergreat Constrn		"
	Hock Chuan Ann Constrn		"
	Job Assoc		"
	Tan Gim Huat Constrn		"
4.	Daewoo	S	Korea
5.	Fougerolle	JV	France
	Reliance Contractors		Singapore
	Antara Koh		"
	Chartered Project Management		"
6.	Ret-Ser Engineering Agency	S	Taiwan

C105A

1.	Dragados Y Construccioness	S	Spain
2.	Dragages et Travaux Publics	JV	France
	Sembawang Shipyard		Singapore
3.	Aoki Corporation	JV	Japan
	Lim Kah Ngam		Singapore
4.	Samwhan Corporation	JV	Korea
	Econ Piling		Singapore
5.	Ohbayashi-Gumi	JV	Japan
	Okumura Corporation		"
	Parsons Brinckerhoff		USA
6.	Dillingham Constrn	JV	USA
	Metrobilt Constrn		Singapore
	Neo Corporation		"
	SPA Constrn		"
7.	Citra Constrn	JV	Australia
	SPIE-Batignolles		Italy
	Active Bldg & Civil Constrn		Singapore
8.	Borie SAE	JV	
	Cogefar SPA		
	Traylor Bros		
	Ong Chwee Kou		

C106A

1.	Gammon (HK)	S	Hong Kong

2.	Borie SAE Cogefar SPA Traylor Bros Ong Chwee Kou	JV	
3.	Campenon Bernard Singapore Piling & Civil Engineering	JV	France Singapore

C107A

1.	Marubeni Corporation Taisei Corporation Shimizu Corporation	JV	Japan
2.	Hazama-Gumi Ltd Japan Dev Constrn RDC	JV	Japan " Singapore
3.	Kier Int'l Ltd Lilley Constrn Sum Cheong Piling	JV	 Singapore

C107B

1.	Nishimatsu Constrn Lum Chang	JV	Japan Singapore
2.	Gammon (HK) AB Skanska	JV	Hong Kong German
3.	Borie SAE Cogefar SPA Traylor Bros	JV	Italy France USA
4.	Philip Holzmann Aktiengesel Schaft Low Keng Huat Constrn	JV	German Singapore
5.	Kajima Corporation Keppel Shipyard	JV	Japan Singapore

C110

1.	Montcocol S.A. Ong Chwee Kou Sofretu Wah Chang Int'l Corpn	JV	France Singapore France Singapore
2.	Thyssen Engrg Gmbh Heitkamp Low Keng Huat Constrn Singapore Shipbuilding & Engrg	JV	German " Singapore "
3.	Cgee Alsthom Spie Batignolles	JV	Italy "
4.	Henry Boot Int'l Gammon (HK) Singa Development	JV	UK Hong Kong Singapore

C201

1.	Kier Int'l Lilley Contrn	JV	

	Antara Koh		Singapore
2.	Paul Y	S	Hong Kong
3.	Ohbayashi Corpn Okumura Corpn	JV	Japan
4.	Borie-Sae Cogerar Construzioni Generali S.P.A. Traylor Bros Ong Chwee Kou	JV	
5	Taisei Corpn Shimizu Constrn Marubeni Corpn	JV	Japan " "
6.	Nishimatsu Constrn Lum Chang Bldg	JV	Japan Singapore
7.	Gammon (HK) Reliance Contractors	JV	Hong Kong Singapore
8.	Samsung Constrn Chuan Joo	JV	Korea

C202

1.	Paul Y	S	Hong Kong
2.	Penta-Ocean Constrn	S	Japan
3.	Borie-Sae Cogefar Construzioni Generali S.P.A.	JV	Italy France
4.	Societe Generale D'Enterprise Lee Kim Tah	JV	France Singapore
5.	Taisei Corpn Shimizu Constrn Marubeni Corpn	JV	Japan " "
6.	RSEA Int'l Hock Lian Seng Engrg	JV	Taiwan Singapore
7.	Sumitomo Constrn	S	Japan
8.	Samsung Constrn Chuan Joo	JV	Korea
9.	Citra Constrn Active Bldg & Civil Constrn SPIE Batignolles	JV	Australia Singapore Italy

C203

1.	Antara Koh Samwhan Corpn	JV	Singapore Korea
2.	AB Skanska Cementjuteriet Hexacon Constrn Bored Piling	JV	German Singapore "
3.	Kin Sun Contractors Ahong Constrn	JV	Korea "

4.	RSEA Int'l Hock Lian Seng Engrg	JV	Taiwan Singapore
5.	Sumitomo Constrn	S	Japan
6.	Aoki Corpn LKN Constrn	JV	Japan Singapore
7.	Tobishima Corpn Econ Group	JV	Japan Singapore
8.	Kumagai Gumi Resources Dev Corpn	JV	Japan Singapore
9.	Citra Constrn Active Bldg & Civil Constrn SPIE-Batignolles	JV	Australia Singapore Italy

C204

1.	Antara Koh Samwhan Corpn	JV	Singapore Korea
2.	GTM Entrepose	S	France
3.	Okumura Corpn Oh Teck Whye	JV	Japan Singapore
4.	Dragages et Trauvaux Publics Sembawang Constrn	JV	France Singapore
5.	Dyckerhoff & Widmann AG Metrobilt Constrn Neo Corpn SPA Constrn	JV	German Singapore " "
6.	Aoki LKN Constrn	JV	Japan Singapore
7.	Kajima Corpn Keppel Shipyard	JV	Japan Singapore
8.	Tobishima Corpn Econ Group	JV	Japan Singapore
9.	Leighton Contractors Mega Constrn	JV	Australia Singapore

C301A

1.	Kier Int'l Lilley Constrn Antara Koh	JV	Australia " Singapore
2.	Nishimatsu Constrn Lum Chang	JV	Japan Singapore
3	Dragages et Travaux Publics Sembawang Constrn	JV	France Singapore

C301B

1.	Hazama-Gumi RDC	JV	Japan Singapore

2.	Kier Int'l Lilley Constrn Antara Koh	JV	Australia " Singapore
3.	Nishimatsu Constrn Lum Chang Bldg	JV	Japan Singapore
4.	Dragages et Travaux Publics Sembawang Constrn	JV	France Singapore
5.	Econ Group Tobishima Corpn	JV	Singapore Japan

C302

1.	RDC Sato Kogyo	JV	Singapore Japan
2.	Taisei Corpn Shimizu Constrn Marubeni Corpn	JV	Japan " "
3.	Kajima Corpn Keppel Shipyard	JV	Japan Singapore
4	Dragages et Travaux Publics Sembawang Constrn	JV	France Singapore
5.	Lee Kim Tah Societe Generale D'Enterprises	JV	Singapore France
6.	Econ Group Tobishima Corpn	JV	Singapore Japan

C303

1.	RDC Ohbayashi Gumi	JV	Singapore Japan
2.	Okumura Corpn Oh Teck Thye	JV	Japan Singapore
3.	Campenon Bernard Singapore Piling & Civil Constrn	JV	France Singapore
4.	Lee Kim Tah Societe Generale D'Enterprises	JV	Singapore France
5.	Econ Group Tobishima Corpn	JV	Singapore Japan

C304

1.	RDC Ohbayashi Gumi	JV	Singapore Japan
2.	Wah Chang Int'l Corpn Hyundai Engrg & Constrn	JV	Singapore Korea
3	Gammon (HK) Reliance Contractors	JV	Hong Kong Singapore

C305

1.	RSEA Hock Lian Seng Engrg	JV	Taiwan Singapore
2.	White Industries Low Keng Huat Antara Koh	JV	Australia Singapore "
3.	Wah-Chang Int'l Corpn Hyundai Engrg	JV	Singapore Korea
4.	Gammon (HK) Reliance Contractors	JV	Hong Kong Singapore
5.	Kumagai Gumi	S	Japan

C306

1.	RDC Sato Kogyo	JV	Singapore Japan
2.	Borie-Sae Cogefar Construzioni Generali S.P.A.	JV	Italy France
3.	Taisei Corpn Shimizu Constrn Marubeni Corpn Wang Coo-Kien	JV	Japan " " Singapore
4.	RSEA Int'l Hock Lian Seng	JV	Taiwan Singapore
5.	White Industries Low Keng Huat Antara Koh	JV	Australia Singapore "
6.	Dragages et Travaux Publics Sembawang Constrn	JV	France Singapore

C308

1.	Aoki LKN Constrn	Jv	Japan Singapore
2.	Nishimatsu Constrn Lum Chang	JV	Japan Singapore
3.	Gammon (HK) Reliance Contractors	JV	Hong Kong Singapore
4.	Jurong Engrg	S	Singapore
5.	GTM Entrepose Tiong Seng Contractors	JV	France Singapore
6.	Shimizu Constrn Wang Coo-Kien & Co	JV	Japan Singapore
7.	Woh Hup	S	Singapore
8	Sato Kogyo RDC Constrn	JV	Japan Singapore
9.	Wah-Chang Int'l Corpn	S	Singapore

10.	Lee Kim Tah Societe Generale D'Enterprises	JV	Singapore France
11.	Singapore Piling & Civil Engrg	S	Singapore
12.	Low Keng Huat Constrn Antara Koh Metrobilt Constrn	JV	Singapore " "

C310

1.	Okumura Corpn Oh Teck Thye	JV	Japan Singapore
2.	Taisei Corpn Shimizu Constrn Marubeni Corpn Wang Coo-Kien	JV	Japan " " Singapore
3.	Gammon (HK) Antara Koh	JV	Hong Kong Singapore
4.	Campenon Bernard Singapore Piling & Civil Constrn	JV	France Singapore

C402

1.	GTM Enterprise	S	France
2.	Sumitomo Constrn Ong Chwee Kou	JV	Japan Singapore
3.	Paul Y	S	Hong Kong
4.	Geroge Wimpey Int'l Sembawang Constrn	JV	UK Singapore
5.	Hazama-Gumi RDC	JV	Japan Singapore
6.	Woh Hup Kin Sun Contractors	JV	Singapore "

C403

1.	GTM Enterprise	S	France
2.	Sumitomo Constrn Ong Chwee Kou	JV	Japan Singapore
3.	Paul Y	S	Hong Kong
4.	Aoki LKN Constrn	JV	Japan Singapore
5.	George Wimpey Int'l Sembawang Constrn	JV	UK Singapore
6.	JDC Corpn Jurong Engrg	JV	Japan Singapore

7.	Dyckerhoff & Widmann	JV	
	Neo Corpn		Singapore
	Metrobilt Constrn		"
	SPA Constrn		"

C404

1.	GTM Entrepose	S	France
2.	Leighton Contractors	JV	Australia
	Mega Constrn		Singapore
3	Sumitomo Constrn	JV	Japan
	Ong Chwee Kou		Singapore
4.	Paul Y	S	Hong Kong
5.	Aoki	JV	Japan
	LKN Constrn		Singapore
6.	George Wimpey	JV	UK
	Sembawang Constrn		Singapore
7.	JDC Corpn	JV	Japan
	Jurong Engrg		Singapore
8.	Dyckerhoff & Widmann	JV	
	Neo Corpn		Singapore
	Metrobilt Constrn		"
	SPA Constrn		"

C405

1.	White Industries		
2.	Paul Y	S	Hong Kong
3.	RDC	JV	Singapore
	Ohbayashi-Gumi		Japan
4.	Gammon (HK)	JV	Hong Kong
	Singapore Piling & Civil Engrg		Singapore
5.	GTM Entrepose	S	France
6.	Taisei Corpn	JV	Japan
	Shimizu Constrn		"
	Marubeni Corpn		"
7.	RSEA	JV	Taiwan
	Hock Lian Seng		Singapore
8.	Dyckerhoff & Widmann AG	JV	
	Neo Corpn		Singapore
	Metrobilt Constrn		"
	SPA Constrn		"
9.	Aoki	JV	Japan
	LKN Constrn		Singapore
10.	Takenaka Doboku	JV	Japan
	Takenaka Komuten		"
	Hytech Builders		Singapore

11	Chuan Joo Samsung Constrn	JV	Korea "

C501

1.	Nissan Constrn	S	Japan
2.	Sembawang Constrn	S	Singapore
3.	Wah-Chang Int'l	S	Singapore
4	Aoki LKN Constrn	JV	Japan Singapore
5.	Reliance Contractors Gammon Pte Ltd	JV	Singapore Hong Kong
6.	Okumura Corpn Bored Piling	JV	Japan Singapore
7.	RDC Constrn Singapore Piling	JV	Singapore "
8.	RSEA Int'l Hock Lian Seng	JV	Taiwan Singapore
9.	Sato Kogyo Evergreat Constrn L&M Prestressing	JV	Japan Singapore "

Phase	Contract	Contractor	Description		(a)Date of award (b)Contract completion date	Awarded contract sum (including provisional sums)
1	101	Nishimatsu Construction Co/ Lum Chang Bldg Construction	O/L*	Construction of Bishan depot	(a) 10 09 84 (b) 25.05 87	S$ 164,412,000.00
1	102	Paul Y Construction Pte Ltd	O	Construction of Yio Chu Kang and Ang Mo Kio (elevated) Stations' viaduct sections (3.7 km)	(a) 08.10 84 (b) 23 04.87	S$ 82,655,654.43
1	103	Sinbelco Construction Co	O/L	Design and construction of Bishan (at ground) Station, tunnels between Bishan and Braddell (1.52 km)	(a) 14.12 83 (b) 02 01 87	S$ 32,882,507 00
1	103A	Sinbelco Construction Co	O/L	Design and construction of Braddell (underground) Station (civil defence), tunnels between Braddell and Toa Payoh (0.89 km)	(a) 09.04 84 (b) 27.04 87	S$ 58,078,939 00
1	104	Tobishima/Takenaka JV	O	Design and construction of Toa Payoh and Novena (underground) Stations, tunnels between Toa Payoh and Newton (2.61 km)	(a) 14.09 83 (b) 08.01 87	S$ 96,802,000.00
1	105	Bocotra Construction Pte Ltd	O/L	Design and construction of Orchard (underground) Station, tunnels between Newton and Somerset (197 km)	(a) 03.10.83 (b) 21.03 87	S$ 78,800,000.00
1	105A	Dragages-Sembawang Construction Pte Ltd	O/L	Design and construction of Newton (underground) Station (civil defence) adjacent (0.27 km) cross-over section (0.27 km)	(a) 09.01 84 (b) 22.06 87	S$ 43,462,348.00
1	106	Campenon Bernard/Singapore Piling & Civil Engineering Co Ltd	O/L	Design and construction of Dhoby Ghaut Station (underground), tunnels between Somerset Station and City Hall (1.50 km)	(a) 10.10 83 (b) 23.06 87	S$ 51,300,000.00 and FFr 31,150,000 00
1	106A	Bocotra Construction Pte Ltd	O/L	Design and construction of Somerset (underground) Station (civil defence)	(a) 26.01.84 (b) 22 06 87	S$ 39,257,210 00

Phase	Contract	Contractor		Description	(a) Date of award (b) Contract completion date	Awarded contract sum (including provisional sums)
1	107	Kajima/Keppel JV	O/L	Design and construction of tunnels between City Hall and Raffles Place (0.81 km) NB/SB (0.81 km) EB/WB	(a) 10 10.83 (b) 23 06.87	S$ 35,650,000.00
1	107A	Taisei Shimizu-Marubeni JV	O	Design and construction of Raffles Place (underground Station (civil defence); tunnels towards Marina Bay (0.43 km) NB/SB (0.29 km) EB/WB	(a) 07 05 84 (b) 22 06.87	S$ 70,723,000 00
1	107B	Nishimatsu Construction/Lum Chang Building Construction	O/L	Design and construction of City Hall (underground) Station (civil defence), tunnels towards Bugis (0.28 km) NB/SB (0.48 km) EB/WB	(a) 07 05.84 (b) 22 06.87	S$ 77,655,600.00
1	108	Taisei Shimizu Marubeni JV	O	Design and construction of Tanjong Pagar (underground) Station tunnels between Raffles Place and Tanjong Pagar (1.12 km)	(a) 14.12.83 (b) 17 05.87	S$ 63,387,500.00
1	109	Ohbayashi/Okumura JV	O	Design and construction of Outram Park (underground) Station tunnels between Tanjong Pagar and Tiong Bahru (2.32 km)	(a) 01.11.83 (b) 27 05 87	S$ 73,850,000.00
All	110	Henry Boot/Gammon/Singa JV	O/L	Trackwork for phase I, phase IA and phase II (option)	(a) 07.01 85 (b) 26.12 88	£ 53,569,000.00 and US$ 59,148,000.00 and S$ 3 477,450.00
1A	201	Bocotra Construction Pte Ltd	O/L	Construction of Tiong Bahru (underground) Station (civil defence), cut and cover tunnels between Tiong Bahru and headwall (0.96 km)	(a) 08 04 85 (b) 30.11 87	US$ 13,724,411.00 and FFr 25,028,333.00
1A	202	Sumitomo Construction Co Ltd	O	Construction of Commonwealth and Redhill (elevated) Stations, viaduct between headwall and Queenstown Circus (2 51 km)	(a) 11 02 85 (b) 30.11 87	S$ 50,767,979.46

Phase	Contract	Contractor	Description		(a) Date of award (b) Contract completion date	Awarded contract sum (including provisional sums)
1A	203	Aoki/Lim Kah Ngam JV	O/L	Construction of Queenstown and Buona Vista (elevated) Stations, viaduct between Queenstown Circus and Clementi Road (3.61 km)	(a) 07.01.85 (b) 30.11 87	US$ 32,508,375.00
1A	204	Aoki/Lim Kah Ngam JV	O/L	Construction of Clementi (elevated) Station, viaduct between Clementi Road and Ulu Pandan Depot (2 24 km)	(a) 22.04.85 (b) 30.11.87	US$ 21,900,000 00
1A	205	Hiap Shing Construction Pte Ltd	L	Ulu Pandan Depot (earthwork)	(a) 12 08.85 (b) 12.05.86	S$ 2,677,363.00
2A	301	Nishimatsu Construction/Lum Chang Bldg Construction	O/L	Design and construction of Bugis and Lavender (underground) Stations (civil defence), tunnels between City Hall and Lavender (2.39 km)	(a) 14.10.85 (b) 25.09.89	S$227,112,437.50
2A	302	Lee Kim Tah Pte Ltd/Societe Generale D'Enterprise Sainrapt Et Brice JV	O/L	Construction of Kallang and Aljunied (elevated) Stations, viaducts between Lavender and Paya Lebar (2 75 km)	(a) 12 11.85 (b) 25 09 89	S$ 59,520,783.39
2A	303	Okumura/Oh Teck Thye JV	O/L	Construction of Paya Lebar and Eunos (elevated) Stations, viaduct between Paya Lebar and Kembangan (2 26 km)	(a) 16 12 85 (b) 25.09 89	S$ 60,005,677.48
2A	304	RDC Pte Ltd/Ohbayashi Corporation	O/L	Construction of Kembangan and Bedok (elevated) Stations, viaducts between Kembangan and Tanah Merah (3.27 km)	(a) 13.01 86 (b) 25 09 89	S$ 35,048,866 00 and US$ 16,493,584 00
2A	305	Wah Chang Int'l Corporation (S) Pte Ltd/Hyundai Engineering & Construction Co Ltd	O/L	Construction of Tanah Merah (elevated) Station, viaduct between Tanah Merah and Changi Depot (1.95 km)	(a) 13.01 86 (b) 25 09 89	US$ 31,952,260 52
2A	306	Resources Development Corporation Pte Ltd/Sato Kogyo Co Ltd	O/L	Construction of Simei, Tampines and Pasir Ris (elevated) Stations, viaduct between Tanah Merah and Pasir Ris (5.45 km)	(a) 10 03 86 (b) 30.10.89	S$ 91,891,290.00
2A	307	Gammon Ltd	O	Changi Depot Earthworks	(a) 07 10 85 (b) 07.12 87	S$ 9,969,496.50

Phase	Contract	Contractor		Description	(a) Date of award (b) Contract completion date	Awarded contract sum (including provisional sums)
2A	308	Jurong Engineering Ltd	L	Construction of Changi Depot	(a) 08.12.86 (b) 30.10.89	S$ 27,472,514.75
2A	310	Gammon (HK) Ltd/Antara Koh Pte Ltd	O/L	Construction of Marina Bay (underground) Station (civil defence), tunnels between Raffles Place and Marina Bay (1.10 km)	(a) 07.04.86 (b) 25.09 89	S$ 96,247,606 00
2B	402	GTM Enterprise/GTM Int'l Societe Nouvelle Coignet Enterprise/Coignet SAJV	O	Construction of Hishun and Khatib (elevated) Stations, viaduct between Yio Chu Kang and Yishun (6 25 km)	(a) 12.11 85 (b) 09.01 89	SR 92,555,379 16
2B	403	JDC Corporation/Jurong Engineering Ltd	O/L	Construction of Jurong East (elevated) Station, depot sidings and viaduct between Ulu Pandan and Jurong East (2.78 km)	(a) 07.10 85 (b) 31.10 88	S$ 79,580,169 33
2B	404	Aoki/LKN Corporation Pte Ltd	O/L	Construction of Chinese Garden and Lakeside (elevated) Stations, viaduct between Jurong East and Lakeside (3.03 km)	(a) 12.11 85 (b) 31.10.88	S$ 64,750,313 00
2B	405	RSEA Int'l Pte Ltd/Hock Lian Seng Engng Pte Ltd	O/L	Construction of Bukit Batok, Bukit Gombak and Chua Chu Kang (elevated) Stations, viaducts and tunnels between Jurong East and Chua Chu Kang (6.15 km)	(a) 06.01.86 (b) 05.02 90	S$ 50,688,995 20 and US$ 23,424,600 00
2C	501	RSEA Int'l Pte Ltd	O/L	Construction of Boon Lay (elevated) Station, viaduct between Lakeside & Boon Lay (1.48 km)	(a) 09 05 88 (b) 14.05 90	S$ 34,190,000 00
Misc	130	Wah Chang Int'l Corp Pte Ltd	L	Construction, completion and maintenance of MRTC headquarters building basement	(a) 11.04 88 (b) 08.01 89	S$ 6,789,000 00

* Legend : O - Overseas Contractor
L - Local Contractor