

## INTERNATIONAL JOINT VENTURING IN THE STEEL INDUSTRY: A THEORETICAL PERSPECTIVE

SAE-YOUNG KIM\*

*This paper explores the conceptual models of international joint ventures from the economics perspective. Various economic models suggest that foreign direct investment in the U.S. steel industry made good sense. Threats of import restriction, a desperate need for capital for modernization, and the existing over-capacity of the industry all suggest that foreign acquisitions were economically justified.*

*The organizational economic views of transaction cost and resource-based models accurately predicted that the Asian partners would offer important capabilities that were closely tied to their organizational competencies, requiring a degree of integration possible only through ownership. They imply that the American sides must have offered similar capabilities to justify using joint ventures while offering little in the way of direct productive value to be derived from retaining the American parent companies as partners.*

### I. INTRODUCTION

This paper visits the theoretical and conceptual bases for forming and managing international joint ventures (IJV) and interpret the examples from the steel industry in light of this theoretical background.

By doing this, two key issues are to be addressed. First, the study is interested in understanding what the various organizational economics and sociology models can say to systematize and clarify just what happened to encourage the sudden development of production-focused international joint ventures in the U.S. steel industry. Second, the study investigates what this industry has to show about the relative value of these various general models in understanding a specific national industry context. By bringing general concepts into a specific situation, we hope to learn more about the situation and more about the concepts.

The analysis is divided logically into two major concerns. One is to examine the decision to form joint ventures. A variety of organizational, locational and

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\*Professor, Department of International Trade, The Dankook University.

managerial factors drive firms to seek international markets, to attempt foreign direct investment in these markets, and finally to form international joint ventures to manage this investment. Several models are described which have been devised and used to justify the commitment to IJVs in general. We will discuss how these models relate to the ventures in the American steel industry to learn more about the industry and about the models. The second primary concern here is to understand how the IJVs in the study were managed. Again, the descriptive studies will be compared to conceptual models developed to describe international joint ventures in general in search for similarities and differences. As in the case of formation, this method allows us to understand what is unique about steel IJVs and what is consistent between these ventures and the broader population of IJVs. Again, useful lessons can be drawn from steel industry in relation to the general case and about the real value of expectations derived deductively from grounded theory to analysis of a specific situation.

This paper explores the conceptual models of international joint ventures. By setting up the theory of joint venturing from addressing the case of the steel joint ventures, the study expects to be able to learn from them about international joint ventures in general.

## II. THEORETICAL PERSPECTIVE

### 2.1 The Theory of Foreign Direct Investment

Before proceeding to joint venture theory, let us first take a quick look at foreign direct investment in general. This allows us to approach our empirical study with three questions in mind: First, why would foreign firms enter the U.S. steel market? Second, why use foreign direct investment rather than exports to service this market? Third, why use international joint ventures rather than building new plants or simply acquiring American firms? These questions can be placed in a theoretical model to gain some insight from wider experience.

The model of foreign direct investment which seems most appropriate to this situation is John Dunning's Eclectic Model of FDI.<sup>1)</sup> Dunning has written about his model extensively, and it has been discussed at length by other scholars. The summary provided here hardly addresses the nuances of the model, but will be sufficient to undergird exploration of the steel industry. Dunning begins by describing Ownership Factors, resources of a given multinational firm which provide a unique competitive advantage to that firm. He proposes that if the firm has no such advantages or competencies, it will not be able to compete in foreign mar-

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<sup>1</sup> J. Dunning, "The eclectic paradigm of international production: A restatement and some possible extensions", *Journal of International Business Studies*, Vol. 19(1), 1988, pp. 1-32.

kets, given its inherent disadvantages of distance, shipping costs, tariffs, and unfamiliarity with the market. However, ownership advantage, in a perfect market and the absence of other factors, only implies that the firm can successfully export to the foreign market.

In the steel industry, we see that foreign firms had several advantages over U. S. firms. First, many of them used more modern process technologies and were considerably more efficient than the American companies. Second, the quality of their product was often higher, particularly in the case of the Japanese steel companies. Third, due to process efficiencies, lower labor costs, and subsidies, foreign firms could sell profitably at lower prices. These advantages were reflected in the fact that, despite transportation costs and delays and distance from customers, foreign imports were making significant inroads into the U.S. market in the 1970s and 80s. The sustainability of such advantages, despite their seeming simplicity, is indicated by the rush of American steel makers to leave the industry or seek government protection rather than compete directly. The institutional factors of domestic overcapacity, strong union pressures, and capital starvation kept the U.S. industry at a disadvantage even while it understood many of the causes for its problems.

So the foreigners were able to make better, cheaper steel and export it to the U.S. at a profit. Why then would some of them decide to move production to the U.S.? Dunning describes Location Factors which work to determine where production will take place in an international business. These factors provide advantage to the firm which can locate its operations in that place, whether home or host country (or, possibly, even a third country), where the economics of the location provides the greatest efficiencies. In the early stages of internationalization of the steel industry, raw materials were traded from places that had them to places where they were needed by the market. Basic trade economics and comparative advantage explain this. Finished steel first began to be traded because the input factors of production, primarily labor, were much less expensive in some locations, particularly Japan and Korea, than in the U.S., the primary importing nation. In other cases, especially that of Western European producers, government subsidies lowered production costs and encouraged exports to maintain employment levels in the industry. Thus, government distortions of the market encouraged some trade in steel. Further threats of government intervention, this time on the part of the United States government, were a primary encouragement for foreign producers to move operations to America.

Steel industry pressure resulted in a number of anti-dumping actions against foreign producers, and threats of punitive and protective tariffs loomed large as the U.S. industry went through its period of shrinking production, layoffs, and plant closures. At the same time, labor cost advantages began to disappear for the Japanese and primary customers, also responding to U.S. protectionist threats (primarily in the auto industry), moved to American based production. In-

creasing home costs, a customer base which had shifted to the U.S., and various real, threatened, and anticipated trade restrictions made production in the U.S. begin to appear to make economic sense. Recognition that their product and process technologies were perhaps superior to U.S. practice moved the competitive advantage of foreign producers away from location-based low factor costs to company-based technological competencies which could be transplanted.

The final step toward direct investment in Dunning's model is the recognition of Internalization Factors, organizational capabilities which make ownership and direct control of overseas operations preferable to market controls. Of primary interest are organizationally bound, complex skills which are difficult to fully describe in documents or involve complex social interaction in teams. Such tacit resources encourage the firm to become a multinational by extending its internal organization abroad. Through foreign direct investment, the company is able to accomplish two main goals. First, it can protect its proprietary knowledge from compromise to a licensee or export sales agency. Many companies have discovered that training partners in applying their unique skills, without ownership, has led to creating competitors while providing inadequate royalty compensation. Second, the firm can ensure that its unique capabilities and resources are applied properly. Thus, a valuable brand name is not ruined by being attached to low-quality goods or poor service, a unique product technology is engineered correctly, and a complex production process is organized and managed correctly. The multinational company can both protect its sources of competitive advantage and can manage them for maximum economic benefit. The Eclectic Model provides a reasonable explanation, from an economics perspective, for foreign direct investment, but provides no direct explanation for joint ventures as a specific form of FDI. That is the subject of the following sections.

## 2.2 Defining the International Joint Venture

As we intend to focus on internationally shared equity joint ventures, we should first define in detail just what we mean by this categorization. A scholar<sup>2)</sup> defined joint ventures as an integration of operations between two or more separate firms, in which the following conditions are present:

1. The joint venture is under the joint control of the parent firms, which are not under related control;
2. Each parent has invested a substantial amount in the joint venture company; and,

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<sup>2</sup> Joseph Brodley, "Joint Ventures and Antitrust Policy", *Harvard Law Review*, Vol. 95, May 1982, pp. 1521-1590.

### 3. The joint venture exists as a business entity separate from its parents.

There are two general forms of organization which meet this definition. One is the acquisition of part of one firm by another. In this case, one partner/owner is a distinctly separate firm, while the remaining ownership is shared among whatever private or public equity holding existed previous to the partial acquisition. The other form is the establishment by two (or more) independent companies of third business entity in which the parents each own significant equity shares. Here, the parents share ownership, management responsibilities, and profits of the joint venture company. The parents may hold equal shares of the joint venture, or they may participate as majority and minority interests.

International joint ventures are further defined as shared equity organizations in which the joint venture and at least one of the parent firms are based in different countries.<sup>3)</sup> Most IJVs conform to the model of a multinational parent and a local parent (or group of local equity holders), for which a primary motivation is access to the local economy. However, other IJV ownership structures may include two parents from one home country organizing a joint venture in a foreign country where their combined resources appear to offer unique advantages either for market access, raw material access, or offshore production. Also, parents from two (or more) foreign countries may set up a strategic alliance in a third country in order to apply their pooled assets in a similar manner.

Many academic and managerially oriented books and articles have been written about joint ventures and other strategic business alliances. Equity joint ventures are but one variety of strategic alliance, with unique advantages and disadvantages over other forms. In order to study international joint ventures in their full organizational context, we need a common understanding of their role in the world of alliances. The next section provides a summary of the alliance forms which places the equity joint venture on the continuum of alliance organizational forms.

### 2.3 Joint Ventures and other International Strategic Alliances

A variety of terms have been used to describe cooperative relationships among business firms. "Strategic alliance" is a broad term, encompassing most of the cooperative forms, and also implies the significance of cooperative forms to the strategic success of the companies in question. No longer are long-term licensing agreements or equity joint ventures considered as second best responses to government requirements or exotic secondary markets. Rather, cooperative arrangements are used to change the terms of competition across major industries. The

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<sup>3</sup> Michael J. Geringer, "Strategic determinants of partner selection criteria in international joint ventures", *Journal of International Business Studies*, Vol. 22(1), 1st Quarter 1991, pp. 41-62.

subtle differences among the various types of alliances make strategic nuance possible. An extensive list of possible alliance types is provided by Farok Contractor and Peter Lorange<sup>4</sup>), and is shown in Table 1.

Table 1 indicates the variety of alliances, listed in order from the least permanent and lowest commitment extended license agreements to equity joint ventures. Technical training or startup assistance agreements require involvement of the two organizations over the period of time which covers the training period, but then terminate by prearrangement. The degree of involvement is that needed to support a small training team in a foreign location for usually a short time. Franchising predicates a long and indeterminate lifetime for the alliance, but requires only limited commitment. Most franchise agreements are detailed, requiring only periodic monitoring. Enforcement is primarily in the form of agreed termination for non-performance.

Research partnerships and other high level agreements anticipate long-term alliances with significant degrees of interaction between the partners in a manner difficult to fully specify, thus engendering significant organizational commitments. Such alliances subject the partner firms to mutually high potential risks from opportunism or cheating by the other firm. The most significant degree of partner interaction in an alliance is shared equity ownership in a joint venture.

Stock ownership permits the partners freedom to access information, monitor performance, and control operations in ways which would be subject to high risks and intense negotiations in a contractual mode. Partners can protect their share of the residual income and have input to decision making without constant renegotiation. Equity ventures, by setting up new organizations, can increase the loyalty of managers, who are removed from the parents, and workers, who are usually hired directly by the joint venture, and can encourage transfer of organizationally embedded, implicit knowledge and group skills.

At the same time, shared equity joint ventures do pose risks to the alliance partners. The partner firms may gain new knowledge from their ally, but they also risk opening themselves to the same freedom of information access by the ally. The flexibility and managerial discretion in equity joint ventures make possible the sharing of complex organizational knowledge and skills as well as the opportunity for managers to run the joint venture as an independent firm. This freedom puts the know-how of the parents on the table to some extent, but also provides much greater potential for sustained relationships and high levels of profitability. The complexity of the interactions in shared equity joint ventures makes them of particular interest to alliance studies. This series of case studies focuses on equity joint ventures in the steel industry, both from the importance

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<sup>4</sup> F. J. Contractor & P. Lorange, "Why should firms cooperate? The strategy and economic basis for cooperative ventures", In *Cooperative strategies in international business*, ed. F. J. Contractor and P. Lorange, Lexington, MA: Lexington Books, 1988, pp. 3-30.

[Table 1] Types of Cooperative Arrangements

Type of Cooperative Agreement	Extent of Integration
Technical training/start-up assistance agreements	Low
Production/assembly/buy-back agreements	
Patent licensing	
Franchising	
Know-how licensing	Moderate
Management/marketing service agreements	
Partnerships in:	
Exploration	
Research	
Development/coproduction	High
Equity joint venture	

of the industry and the revelations about the globalizing world economy to be found in these ventures. The next section discusses the theoretical and managerial issues behind the use of IJVs from the perspective of the multinational firm.

This is followed by a discussion of the impact of joint ventures involving foreign firms on the host nation economy.

#### 2.4. The Multinational Firm and the International Joint Venture

Joint ventures are claimed to be strategic responses to uncertainty and growth in the environment. How does this work? Theoretical answers are provided by the major economic models of the multinational firm.<sup>5)</sup> The strategic behavior model of the multinational firm, based on the concepts of Industrial Organization Economics, suggests that strategic alliances permit large oligopolistic firms to extend their influence widely, even in the face of government resistance and competition. Such firms identify and occupy market positions which can be defended against further entry, thus permitting them to gain and share monopoly profits. Internationally, this type of strategy suggests foreign direct investment strategies which allow the multinational firm to lock up foreign markets. When wholly owned subsidiaries are not permitted, joint ventures provide a long term market position through association with a host country firm. Potentially threatening local firms can be absorbed or otherwise controlled by provision of technology, skills, and capital, so that they aid the multinational rather than attacking it.

An alternative interpretation of the reasons for joint venture formation is

<sup>5</sup> B. Kogut, "Joint ventures: theoretical and empirical perspectives", *Strategic Management Journal*, Vol. 9, 1988, pp. 319-332.

provided by internalization theory, and international version of transaction cost economics.<sup>6</sup> This model suggests that an alliance, and a joint venture in particular, acts as a performance bond when two firms wish to combine resources, do not trust each other to act fairly in a pure market transaction, but do not desire a full merger of assets. Hennart proposes that when two firms each possess unique resources or capabilities which would have higher values if combined, but for which market prices cannot be determined, a joint venture may be the answer<sup>7</sup>. Joint ownership allows the firms to combine even difficult-to-transmit capabilities without having to deal with a large numbers of irrelevant assets which would be included in an acquisition. The parents can then monitor the use or misuse of the assets and skills which they have each provided. Long-term equity alliances guarantee that both sides can monitor the transaction and that rewards to both partners are related mutually to the success of the venture. If either partner cheats, the joint venture will be harmed, costing both equity holders a part of their earnings. Lack of confidence in a fair deal or a reliable alliance partner is exacerbated by the different outlooks of managers in firms from different countries, making joint ventures particularly likely in international dealings.

A different but compatible perspective on IJVs is provided by the Resource-based Economics view of the firm, which focuses on bundling strategic and generic resources to gain economic rents (Profits)<sup>8</sup>. This view of businesses suggests that joint ventures allow firms to combine valuable resources which are related to tacit know-how and are tied broadly to the organization and its routines. Such competencies are impossible to transmit through licenses or patents because they involve team activities and learning by doing.<sup>9</sup> Therefore, sharing such complex skills requires transplanting part of the organization and its people so that the alliance can learn how to perform the requisite tasks from both parents. While combining such implicit skills requires the close and extended relationships of a joint venture, the parents risk the loss of their particular core competencies to the joint venture and to their partner, particularly if one is more aggressive about learning than the other.<sup>10</sup> Chi(1994)<sup>11</sup> shows that forming these bundles of stra-

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<sup>6</sup> Peter J. Buckley and Mark Casson, "A theory of cooperation in international business", In F. J. Contractor and P. Lorange, eds., *Cooperative Strategies in International Business*, Lexington, MA: Lexington Books, 1988, pp. 31-54.

<sup>7</sup> J. F. Hennart, "The transaction costs theory of joint ventures: an empirical study of Japanese subsidiaries in the United States", *Management Science*, Vol. 37(4), 1991, pp. 483-497.

<sup>8</sup> E. Penrose, *The Theory of the Growth of the Firm*, 1959.

<sup>9</sup> C. K. Prahalad & G. Hamel, "The core competence of the corporation", *Harvard Business Review*, May-June 1990, pp. 79-91.

<sup>10</sup> G. Hamel, "Competition for competence and inter-partner learning within international strategic alliances", *Strategic Management Journal*, Vol. 12(S1), 1991, pp. 83-103.

<sup>11</sup> T. Chi, "Trading in strategic resources: necessary conditions, transaction cost problems, and choice of exchange structure", *Strategic Management Journal*, Vol. 15(4), 1994, pp. 271-290.

tegic and supporting, or complementary, assets involve non-recoverable transactional investments which make market, alliance, and wholly-owned packages non-equivalent. Porter says that the different environments in different home countries lead to firms from these countries evolving distinctively different capabilities.<sup>12</sup> The organizational skills most likely to develop in this way are tied so closely to the firm itself that they cannot be transmitted to a firm from a different nation. Thus, the unique environments of firms from different home countries both encourage bundling complementary skills and make international equity alliances the best way to meld these embedded competencies.

Resource-based and transaction cost arguments for joint ventures support one another. The resource-based model explains why the profits available to the joint venture may exceed market or ownership relationships - the bundling of two (or more) sets of unique organizational resources to produce larger joint profits. Transaction costs explain the value of using an equity alliance - protecting the parent company's interest in the skills and assets which it shares with the JV while making the knowledge transaction as efficient as possible. The projections of both theories are enhanced in the international arena, where firms have very different capabilities and less understanding of each other.

Other economic models provide insight on joint venture formation and management. Evolutionary economics suggests that the joint venture will provide an opportunity to try new combinations of capabilities, some of which will provide new economic value to the JV and to one or both of the parents. The joint venture thus becomes a learning opportunity for the parents, both through observing the partner's capabilities in action and by trying new ways of applying one's own competencies. Finally, the use of game theory in economic modeling shows that while competitive relations can be preferred in a single iteration game, cooperation provides the best outcome for both players in a multiple turn game, particularly with non-zero sum payoffs.<sup>13</sup> If alliances are treated as true sources of advantage, such that internal opportunism is eliminated as non-productive, stable cooperative relationships of business organizations appear to have great theoretical potential as strategic solutions to the uncertainties and demands of a dynamic but confusing environment, typical of international conditions.

Organizational theory also addresses joint ventures as a form of business organization. Shenkar and Tallman suggest that a number of organizational considerations can lead to specific forms of alliance.<sup>14</sup> Pfeffer and Nowak show that firms act to reduce the potential ill-effects of excessive dependency on other firms

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<sup>12</sup> M. E. Porter, *The Competitive Advantage of Nations*, New York: The Free Press, 1990.

<sup>13</sup> A. Parkhe, "Strategic alliance structuring: A game theoretic and transaction cost examination of interfirm cooperation", *Academy of Management Journal*, Vol. 36(4), 1993, pp. 794-829.

<sup>14</sup> S. B. Tallman & O. Shenkar, "A managerial decision model of international cooperative venture formation", *Journal of International Business Studies*, Vol. 25(1), 1994, pp. 91-114.

through joint ventures.<sup>15</sup> Internal compromise in approaching overseas markets in general and unfamiliar countries in particular, partial interdependencies among the interests of two firms, and corporate culture and institutional routines influence the selection of strategic alliance type for a multinational firm. The similarity (or difference) of national cultures between home and host countries will influence the choice of organizational form in specific ventures, and the requirements, needs, and desires of other concerned stakeholders (government, labor unions, investors, etc.) in a particular host location will also affect the choice of alliance form. Traditional international business studies of international joint venture activity emphasize the importance of cultural distance as an incentive for the hedged approach to the market represented by the IJV.

Institutional models suggest that uncertainty leads managers to be conservative in committing resources to new directions, encouraging joint venture use in new or unfamiliar markets, particularly when joint ventures are common in an industry.<sup>16</sup> Kogut and Singh show that joint ventures are preferred over acquisitions when the cultural distance between home and host country is greater, creating uncertainties.<sup>17</sup> Koblin shows that among less-developed regions, American multinationals use more shared control; as host regions are farther from the U. S., both geographically and culturally. Various studies suggest that partners with complementary task related assets and related firm cultures form more lasting alliances.<sup>18</sup> On the other hand, Arvind Parkhe proposes that while complementary economic resources provide incentive to form joint ventures, different company cultures are the most common reason for JVs to dissolve.<sup>19</sup> The different national cultures influencing the firms of different national origin in an international joint venture arrangement make such an outcome quite likely.

In summary, economic theory provides a variety of conditions which might encourage joint ventures. However, economics can only say that failure indicates a change in the conditions that favored joint venturing, resulting in a shift to another form. Organizational models, on the other hand, provide less convincing arguments for why JVs might be a preferred form, but are much more convincing in explaining why they are a hedge against uncertainty (a second best option)

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<sup>15</sup> J. Pfeffer & P. Nowak, "Joint ventures and interorganizational interdependence", *Administrative Science Quarterly*, Vol. 21, 1976, pp. 398-418.

<sup>16</sup> P. DiMaggio & W. Powell, "The iron cage revisited", *American Sociological Review*, Vol. 48(2), 1983, pp. 147-160.

<sup>17</sup> B. Kogut & H. Singh, "Entering the United States by acquisition or joint venture", Reginald H. Jones working paper series, Wharton School, University of Pennsylvania, 1986.

<sup>18</sup> Michael J. Geringer, "Strategic determinants of partner selection criteria in international joint ventures", *Journal of International Business Studies*, Vol. 22(1), 1st Quarter 1991, pp. 41-62.

<sup>19</sup> A. Parkhe, "Interfirm diversity, organizational learning, and longevity in global strategic alliances", *Journal of International Business Studies*, Vol. 22(4), 1991, pp. 579-602.

and why they so often fail to last. When cultural clash is included in the picture, the simple economics of complementary resources seems rather naive. Fear of differences and incompatibility of interests provide an equally convincing, somewhat more intuitive, and distinctly less appealing view on the use of joint ventures in international markets.

### III. THE STEEL JOINT VENTURE MOVEMENT

One way out of the American steel industry's 1980s financial dilemma was to seek foreign investment. But foreigners were no more likely than American investors to find the steel rate of return attractive, unless they had some other incentive. That incentive found its focus in joint venturing rather than either attempting to transplant outposts of foreign firms to American soil as the automobile industry had done or purchase outright the assets of American steel producers.

#### 3.1 Joint Venture Motives

The National/NKK joint venture reflected well the motives of their respective national industries. The American firms were the most single-minded to begin with. They wanted access to financial capital not available to them from U.S. sources. However, as they began the pursuit of partnerships, some of the U.S. firms recognized other potential gains and ended up finding even more advantages than they expected. Access to improved technologies, a greater quality consciousness, more aggressive preventive maintenance, and changed approaches to employee-employer relations emerged as by-products of the joint ventures.

The Japanese from the beginning had essentially three motives for joint venturing with U.S. firms. They wanted access to the world's largest market. Yet opposition to steel imports were rising and the "not so voluntary" restraint agreements were a "steel fist in a velvet glove" reminder of that threat. Domestic production within the United States seemed to be the only practical opening. There might or might not be objection to "greenfield" construction of new Japanese-owned steel facilities, but that was not an attractive alternative at any rate. World steel capacity was already in surplus supply. That, in part, was the reason for wanting strengthened and guaranteed access to the U.S. market. The only practical approach was to buy into existing U.S. facilities, then invest to modernize and upgrade them, adding new facilities only where no rehabilitatable ones existed.

Finally, and most immediate, Japanese automobile company customers transplanted to the U.S. were complaining of available steel quality and U.S. business methods, entreating and even demanding that their more familiar suppliers come aboard the U.S. industrial scene. They had already imposed that demand upon their Japanese parts and tire suppliers, resulting in their purchase of existing or

establishment of new facilities in the United States.<sup>20</sup> Building galvanized steel capability in the U.S. would be a particular attraction since the Japanese were accustomed to much heavier anti-trust protection than American manufacturers because of their climate and the more intense use of ice-melting salt.

Two forthcoming international joint ventures would not fit that tri-motivation pattern. Both Pohang Steel Company of South Korea and a Brazilian/Japanese joint venture named California Steel would be welcomed into that state as sources of imported semifinished steel for plants which would otherwise have closed with substantial losses of employment.

### 3. 2. Census of Steel Joint Ventures

NKK was first with its National Steel joint venture because it had been negotiating to acquire 75 percent of the Ford Motor Company's steel division when the National Steel opportunity arose. National, on the other hand, had sought to reduce its dependence on the steel industry and a wealthy foreign partner was the next best thing to selling out. Nisshin Steel and Wheeling-Pittsburgh Steel also agreed in 1984 upon a joint venture to produce both galvanized steel and aluminum. Sumitomo Metals Industries and LTV Corporation entered into an agreement in 1986 to construct an electrolytic galvanizing line, followed by a second such line a few years later. Kawasaki Steel and Armco Steel entered a joint venture agreement in 1989 to operate Armco's plant at Middletown, Ohio. U.S. Steel and Kobe Steel joint ventured operation of the USS plant at Lorain, Ohio in 1989 as did Inland Steel and Nippon Steel at Indiana Harbor, Indiana. By the end of the 1980s, all five of the major Japanese integrated producers had formed joint ventures with U.S. steel firms with Japanese firms controlling at least 25 percent of all steel capacity in this country (Table 2).

As noted earlier, for the American firms, access to financial support unavailable from domestic sources was the major attraction of the joint ventures. Investment of the magnitude required to modernize the steel industry was available in the United States only through the stock market.

But the ability to float new stock offerings depended on both the immediate relative rates of return and professional and public estimation of the short and long run outlook for the industry. The Japanese, who depended upon bank loans rather than the stock market and were attuned to longer range concerns than fluctuating stock prices, had only to meet the banks' loan amortization requirements. The Korean government owned 20% of POSCO common stocks and the state-owned Korea Development Bank (KDB) owned 15%. The government still maintains the right to control POSCO's management. Therefore, government poli-

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<sup>20</sup> Martin Kenney and Richard Florida, *Beyond Mass Production: The Japanese System and Its Transfer to the U.S.*, New York and Oxford: Oxford University Press, 1993, pp. 155-89.

cies were major considerations in the investment decisions of the Korean steel industry.

With the Japanese auto transplants as a driving force, the needs of that industry were major factors in product choice. Therefore, though of necessity buying into integrated basic steel companies, the Japanese focus was primarily on a narrow range of products from those mills. Kobe Steel's choice of the Lorain, Ohio USX mill was its high quality steel bars used in the production of engines and transmissions. Nippon Steel made a major equity investment in Inland Steel but put no money directly into that company's existing facilities. Instead, it put up 40 percent of the capital for a totally new cold-rolling mill and 50 percent of the investment necessary for two galvanizing lines on the same property in New Carlisle, Indiana. Indeed, new galvanizing capability became a major focus of the Japanese investment, as noted above. Modernizing an existing electrogalvanizing sheet metal line near Detroit was a major project for NKK in its National Steel investment. The jointly-owned National subsequently became involved with Dofasco of Canada in a 400,000 ton hot-dipped line in that country. Modernization of an older galvanizing line and the building of a new one at Middletown, Ohio were major motives for Kawasaki Steel's investment in Armco Steel. Nisshin Steel bought 10 percent of Wheeling-Pittsburgh Steel and then put up 67 percent of the cost of a new hot-dip galvanizing line at Follansbee, West Virginia. Kobe Steel and USX invested equally in a new hot-dip galvanizing line at Leipsic, Ohio. Sumitomo Metal Industries and LTV established a joint venture in an electro galvanizing line in Cleveland, Ohio and another in Columbus, Ohio.

These facilities serve U.S. as well as Japanese auto assemblers but the latter were clearly the driving force. The Cleveland line of Sumitomo/LTV was designed primarily to supply General Motors and Chrysler with pure zinc-coated steel sheets. However, the Columbus line was designed to produce sheet steel coated with the zinc-nickel alloy preferred by the Japanese automobile assemblers, though it can also produce pure zinc and organically-coated sheets.

Japanese auto manufacturers have not limited themselves to the joint ventures of their countrymen, but the preference is evident, as long as costs and quality are maintained. As of 1993, Honda was obtaining all of its coated steel sheets from Inland and Armco which had joint ventures and Bethlehem which did not. Toyota was buying from LTV, Inland, Armco and National Steel, all joint venturers; Nissan from mills in which Nippon, Sumitomo, Kawasaki, and NKK were joint venturers. Mazda was a major customer of the LTV/Sumitomo Columbus, Ohio facility.<sup>21)</sup>

But the auto industry was not the only motivator for international joint ventures. United States Steel negotiated unsuccessfully with British Steel in 1985 to

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<sup>21</sup> B. O. Huallachain, "The Restructuring of the U.S. Steel Industry: Changes in the location of Production and Employment," *Environment and Planning A*, Vol. 25, 1993, pp. 1347-1349.

**[Table 2]** Foreign Steelmakers Investment in U.S. Joint Ventures

Foreign Partner	U.S. Partner	Name	Type of Operation	Location	Date Begun	Employment	Investment (\$ mil.)	Foreign share (%)
Nippon	Inland	I/N Tek	Cold rolling	New Carlisle IN	1990	280	520	40
Nippon	Inland	I/N Kobe	Galvanize	New Carlisle IN	1991	250	550	50
Nippon	Inland		Integrated	Indiana Harbor IN.	1989	11,500	186	14
NKK	National Intergroup	National	Integrated	Ecorse MI; Granite IL; Portage, IN.	1984	12,000	2.2bil.	70
Kawasaki	Armco	Armco	Integrated	Middletown, OH.	1989	9,500	1.6bil.	45
Kawasaki	Armco	Armco	Galvanize	Middletown, OH.	1991	100	150	50
Kawasaki	CVRD (Brazil)	Calif	Rolling	Fontana, CA.	1984	725	275	50
Kobe	USX Corp.	USS-Kobe	Integrated and Pipe	Lorain, OH.	1989	3,000	300	50
Kobe	USX Corp.	Protec Coating	Galvanize	Leipsic, OH.	1992	100	200	50
Sumitomo	LTV Corp.	LSE I	Galvanize	Cleveland, OH.	1986	83	100	40
Sumitomo	LTV Corp.	LSE II	Galvanize	Columbus, OH.	1991	100	180	50
Nisshin	Wheeling-Pittsburg	Wheeling-Nisshin	Integrated and coating	Steubenville, OH.	1988	5,500	15	10
Nisshin	Wheeling-Pittsburg	Wheeling-Nisshin	Galvanize	Follansbee, WV.	1988	100	96	67
Nisshin	Wheeling-Pittsburg	Wheeling-Nisshin	Galvanize	Follansbee, WV.	1993	100	120	100
Yamato Kogyo	Nucor	Nucor-Yamato	Mini-Mill	Blytheville AR.	1988	320	210	50
Kyoei/Sumitomo		Aurban	Mini-Mill	Auburn, NY.	1975	315	300	100
POSCO	USX	UPI	Cold roll	Pittsburg, CA.	1986	990	437	50

Sources: Martin Kenney and Richard Florida, *Beyond Mass Production: The Japanese System and Its Transfer to the U.S.*, New York and Oxford: Oxford University Press, 1993, p. 157, and authors' data.

import slabs as an alternative to modernizing its iron and steel producing facilities at its New Jersey Fairless plant. During the 1970s with its domestic demand booming, Kawasaki Steel had entered into a Brazilian joint venture to produce and import steel slabs into Japan to feed its finishing mills. But when steel demand slowed its growth after 1973, Kawasaki had no further need for the added slab capacity to which it had committed itself. However, Kaiser Steel had closed its Fontana, California integrated plant. Kawasaki, CVRD, a Brazilian iron ore company, and a U.S. steel warehouse and fabricator, the Wilkinson Group, entered into a 1984 joint venture to purchase the finishing end of the Kaiser facility for which it imports Brazilian slab. It was also in that context that United States Steel and Pohang Steel Company of South Korea entered into a joint venture in 1985 to own, modernize and operate the near-obsolete USS finishing mill at Pittsburg, California, no longer able to meet the quality demands of its canning industry customers. And in 1989, The Japanese Yamato and American Nucor mini-mill companies joint-ventured a structural mill on the Mississippi River in Arkansas capable of producing 650,000 tons a year of wide-flange beams up to 24 inches.<sup>22)</sup>

#### IV. INTERNATIONAL JOINT VENTURE FORMATION: THEORY AND PRACTICE IN THE AMERICAN STEEL INDUSTRY

The first aspect of international joint ventures which we address is just why multinational companies would form such organizations in the first place. One of the more interesting developments in these cases relates to a theory which is not addressed previously except as a rejected alternative. This is neoclassical trade theory, and its formal interpretation of the meaning of foreign direct investment. Given all assumptions of this theory, international exchange should all take place through markets, and all production factors are immobile. Partially relaxing the assumption of factor immobility suggests that foreign direct investment is the movement of capital from locations which provide low returns to those which provide higher returns because capital is less available in those locations. Foreign direct investment theory concluded that this model was hopelessly unrealistic when Stephen Hymer showed in his dissertation<sup>23)</sup> that most direct investment took place among the industrialized nations, all of which were presumed to have plentiful capital. He assumed, therefore, that location-based return on capital investment was not the primary reason for foreign direct investment. Hymer went on to lay the foundation for the 10 or strategic behavior model of foreign direct

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<sup>22</sup> T. William and S. J. Hogan, *Global Steel in the 1990s: Growth and Decline*, Lexington, Massachusetts: Lexington Books, 1991, p. 211.

<sup>23</sup> S. H. Hymer, *The international operations of national firms: A study of direct foreign investment*, Ph. D. dissertation, MIT, 1960 (published by MIT Press, 1976).

investment – and subsequently of international joint ventures.

The cases discussed previously, however, should give some pause to those who have joined in decrying the relevance of neoclassical trade theory to the microeconomics of direct investment. Specifically, in every case described here, the U.S. parent sought a foreign partner (or acquisition) to provide capital, and the foreign partners all immediately provided large infusions of cash.

This condition reflected a basic imperfection in financial markets. Neither the U.S. equity markets nor American banks was willing to supply the large quantities of capital needed by American steel firms to update their processes to remain globally competitive. Overcapacity in the U.S. and worldwide markets made profits scarce and gave little hope that large investments would result in large profits with any certainty. However, foreign capital markets, and particularly the Japanese corporate debt market was willing to support this massive investment. Japanese banks were not as concerned with levels of profit as they were with ability to amortize debt. The “patient” capital from Japan was willing to take a long-term perspective on profitability for the various reasons stated in the cases. U.S. equity markets, on the other hand, were almost totally driven by current profit levels. In addition, the return to investment in the U.S. was typically higher than for most investment in Japan, and the dollar was generally strong during the period of investment. Japanese banks had equity positions in Japanese steel companies. They also held shares in the Japanese auto assemblers which would provide immediate customers for Japanese quality steel produced in the U.S. and provided on a “just-in-time” basis. The Japanese undoubtedly saw that the low quality and productivity of American producers provided an easy opportunity to take market share from competitors, particularly if acquisition led to replacing capacity, not adding to it.

The upshot is that all of the steel IJVs had as a primary *raison-d'être* the provision of capital to cash-starved U.S. production facilities. Even in two capital rich countries, alternative perspectives on the profit potential of certain industries created a situation where capital from one market could find high levels of demand in the other. While the macroeconomic conditions of the U.S. and Japan were similar, the microeconomics of the two national steel industries were quite different.

Thus, Asian investment in productive capacity in the U.S. makes sense from a simple capital mobility perspective. However, the organizational form of foreign direct investment is not directly explained by this slight relaxation of the neoclassical assumptions. Rather than further deconstructing this model, we can look to newer models of industry and organizational economics to explain the details of the transactions.

#### 4.1 Foreign Direct Investment Theory

From the perspective of the Eclectic Model of foreign direct investment, Asian steelmakers' investments in the U.S. industry would seem to have made sense. Ownership capabilities and resources included the access to capital detailed above in relation to the neoclassical economics approach to direct investment. They also included the product and process technologies in which the Asian producers were expert as well as the management techniques – total quality, training, team production, etc. – which really turned these plants into competitive facilities. All of these concerns were essential. Without foreign control and technology, there was no reason to suspect that the American plants would provide any profits, despite capital infusions. Without the capital, existence of superior processes made little impact on firms which could not afford them.

Locational factors are largely explained above. The actuality and threat of protectionist legislation and regulation made increasing exports undesirable and risky. The Japanese (and Korean) manufacturers needed to bring their process skills and management methods to the American investments in order to get a better return on their bank capital and to increase sales in the U.S. In order to do this, they had to be present in the U.S. In addition, as their multinational customers in the auto and appliance industries located in the U.S., the need to be close to their customers forced the steelmakers to enter the U.S. with direct investment. As we have seen, industry overcapacity made acquisition the efficient method for entry, as further increases in capacity could only drive down prices and generate additional political problems.

Finally, internalization was encouraged by the nature of the resources and capabilities brought into the U.S. Foreign ownership follows logically after foreign investment. The Japanese banks would provide capital in the U.S. market, but not as direct loans to proven problem firms. The capital was available through the Japanese steel companies, which could provide the guidance and control to ensure that the American investments would be made efficient and productive. Therefore, the direct investments were made by the Japanese steel companies using bank money provided to them. Ownership came through equity investment. The Japanese bought American assets and thus became owners of American plants. This ensures both access to profits and the right to control the purchased facilities. Ownership also permitted the Japanese and Korean partners to closely monitor and control the application of their process methods, quality systems, training, and other complex capabilities which were not amenable to licensing the way simple technology might be. Still, the actual decision to joint venture is not addressed in this model, as discussed above.

## 4.2 Industry Economics and Acquisitions

The "strategic behavior" model of the joint venture provides our first look at the decision to joint venture.<sup>24</sup> As explained previously, this model takes an Industrial Organization Economics perspective on strategic decisions. That is, it focuses on industry conditions. First among these is the political sensitivity of the steel industry. As the basis for much industrial and military strength, it is of considerable concern to governments. Therefore, the same imperatives which made increased imports risky suggested that complete takeovers of a significant number of steel plants by Japanese firms would arouse government scrutiny and perhaps restrictions. Joint ventures, by retaining a local connection, are often safer in a touchy political situation.

Another aspect of strategic behavior is that large multinationals can use joint ventures to subordinate local concerns and control local industry. In this industry, though, foreign steel makers were neither larger nor more powerful than Americans, although they did have better, more committed management and experience with superior technology. Caves attributes foreign direct investment to superior technological and management capabilities rather than simple market power, and may be close to the mark in this case. Interestingly, it appears that both U.S. and foreign partners expected the Japanese firms in particular to provide superior new technology. While this did occur in some cases, in others events showed that the technological differences were not great. What the Japanese firms did bring to their American investments was superior production management techniques and a commitment to long-term continuous improvement. These capabilities seem to be the basis for the financial successes of the joint ventures studied. However, these skills could not be said to provide dominance to the foreign partners.

Contrary to some industry-focused models, the overcapacity and resulting lack of profits in the U.S. steel industry did not act to discourage foreign investment. However, market crowding and overcapacity in the industry were primary disincentives for greenfield plants. Acquisition, whether whole or part, changed ownership and management but did not add to the competition in the steel industry. And, of course, some of the excess capacity that drove down profits was created by U.S. imports from these same Japanese and Korean companies. The American ventures replaced trade in finished steel, but were stabilized by imports of raw steel or iron, particularly in the cases of the finishing mills.

A final concern of the industry model of competition is the availability of customers. Customer demand pull from Japanese auto makers which were traditional customers of the Japanese steelmakers appears to have been a major fac-

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<sup>24</sup> B. Kogut, "Joint ventures: theoretical and empirical perspectives," *Strategic Management Journal*, Vol. 9, 1988, pp. 310-332.

tor in attracting steel investment. The auto assemblers were not happy with U.S. quality and were generally uncomfortable with American inns holding critical positions in their logistical chains. By inviting their Japanese suppliers to come to America, these firms provided assurances of initial markets. The same demands for automobile-quality steel from U.S. car makers provided additional customer pull. In the cases of the west coast finishing plants, the demand for bar and sheet steel for burgeoning construction and the stability of agricultural demand for can stock made obvious the market potential for lower cost production of the same products.

From an industrial organization perspective, then, foreign investment in U.S. steel made sense. Political pressure to reduce imports was high. The competition was weak, demand for high quality and lower cost production was in place, foreign raw materials provided cost advantage, and the technological and managerial superiority of the Asian producers were apparent. However, while such a market power approach can explain investment, and the attraction of acquisition over new capacity, it does not really justify the use of international joint ventures. For that, we look to other models which look at the firms and the individual transactions.

#### **4.3 Transaction Cost Economics and International Joint Ventures**

Transaction cost models, such as the internalization model described previous, focus on the relative governance costs of different ways of organizing foreign subsidiaries. Market governance, exports in this case, are preferred when markets are free to operate and when specialized investment is minimal. Once markets are disrupted, as by government action, or specialized production is required, as for the automotive industry, multinational firms begin to seek internal hierarchical governance—they build or buy their own facilities in the foreign market. The effect of trade restrictions on direct investment is common to all models, including trade theory—if a firm cannot sell freely from abroad, a natural response is to locate in the target market. The role of specialized investment is unique to transaction cost economics. This economic theory presupposes that partners may be opportunistic, that they will violate the terms of any contract if this option seems lucrative. When one partner is forced to make large investments, such as in added productive facilities for specialized steels, then opportunism by the other partner can generate very high costs. Thus, to rely only on market transactions, whether with final customers (the auto companies) or with U.S. finishing mills for semi-finishing steel, created a risk of being left with overcapacity if the contracts were violated or not renewed. In such a case, vertical integration by whole or partial ownership can guarantee market access for intermediate products. This appears to have been a significant motivator in the cases of the west-coast finishing mill ventures, where POSCO and the Japanese-Brazilian partnership needed

outlets for their own semi-finished product.

Another major motivator for internalizing international operations, according to transaction cost economics, is that tacit, organizationally bound, complex knowledge such as process technology and management techniques cannot be adequately transmitted by market relationships such as licensing. For the Japanese steel companies to supply their technology and operations management systems to American plants, they needed direct managerial involvement on a large scale, a situation best solved by bringing these plants inside the Japanese company. This permits them the Japanese partner to transmit knowledge through close, ongoing direct relationships, permits them to bring pressure on reluctant partners to adopt new method, reduces the risk of creating a strong competitor, and ensures a share of the long-term payoffs from organizational change. This condition seems to have been a major motivation for the acquisitions of the integrated operations and of the I/N Tek and I/N Kobe joint ventures. Without managerial control, things would not change, without ownership the necessary control was not available and the rewards to changes in the U.S. plants were not assured.

Again, though, the question remains—Why did the Japanese not just buy the American plants? Transaction cost models of joint ventures suggest that both sides must have difficult-to-market organizational resources and neither side can be able to make an outright acquisition. The Asian companies were not in a position to acquire all of USX, NII, or other American steel companies. However, it is clear that individual plants were available for purchase (in the case of National, the U.S. partner even preferred this option). It is also clear that the American companies offered little in the way of useful complex knowledge, only Inland Steel offered to provide raw materials at a level sufficient to want a guaranteed supply to protect the continuity of highly automated operations, and most of the American parents refused to continue infusions of capital. Yet, only in the case of California Steel was there not an American parent company involved in the venture. It would seem that the U.S. parents must have offered some capabilities to the joint ventures that would be lost in an outright purchase of the production facility. To clarify this point, we turn next to the Resource-Based Economics of the firm to get a slightly different perspective on the way resources and capabilities come together to generate profits.

#### **4.4 Resource-Based Economics and the Steel Joint Ventures**

The Resource-Based view of the firm is as a bundle, of resources, some unique to the firm and some, such as capital, necessary but openly available in the market. The key to profitability is possession of unique resources, such as patents, or capabilities, such as management systems, which can be combined to present the marketplace with a unique product. From this perspective, if the most economically rational manner to transmit the firm's unique competencies to a fo-

reign market is through extending the organization, then direct investment will occur. If the unique capabilities of the firm can be enhanced through combination with the capabilities of another firm, then an acquisition or joint venture makes economic sense. In particular, if the resources of the potential partner are tied to the identity of the other firm – its reputation, brand names, national identity, customer or employee loyalty – and would be disrupted or lost to a complete takeover, then a joint venture is the logical way to recombine resources.<sup>25)</sup> As described above, the Japanese and Korean partners brought their capital and their skills in process technology and operations management to the U.S. industry. What they found in American firms were existing plant and equipment, some of it usable, an experienced work force, experienced managers with skills in managing American labor forces (although using very different methods), and considerable willingness to accept the obviously more competitive Japanese ways. Both sides brought customer bases, whether the Japanese auto transplants or existing American markets. Tied to this was the resource that perhaps more than anything else drove the desire to joint venture rather than buy plants outright – national identity. The Japanese had preferred the Japanese auto companies because these customers knew that Japanese steel companies would give them the quality and logistical controls that they needed. The American identity of the U.S. partners protected access to possibly chauvinistic American customers and presented a local identity to governments possibly concerned with foreign penetration of a strategic industry.

Events showed that American managers and workers were much more effective than originally thought – rapid acceptance of TQC methods, discovery that the Americans were aware of the latest technology, and the largely American operating management and work forces confirm this – but constrained by capital shortages and corporate disinterest in remaining in the industry. However, the cases indicate that most of these discoveries were surprises to the Asian partners. Keeping the American firms in the venture may have also reduced the cost of entry considerably, as the foreign entrants were not forced to buy the existing plants before upgrading them. However, at least in the case of National, the purchase price was minimal. As well, a study by Chang indicates that Japanese firms in the electronics industry prefer sequential market entry in order to reduce risks.<sup>26)</sup> A similar dynamic could be in evidence here – exports to joint ventures to (perhaps) whole ownership. It would appear that the primary motivation to retain American partners (California Steel, with its Japanese-Brazilian ownership is obviously outside this discussion, but Kaiser had completely closed the facility) was

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<sup>25</sup> B. Kogut and U. Zander, "Knowledge of the firm and the evolutionary theory of the multinational corporation", *Journal of International Business Studies*, Vol. 24(4), 1993, pp. 625-645.

<sup>26</sup> S. J. Chang, "International expansion strategy of Japanese firms: Capability building through sequential entry", *Academy of Management Journal*, Vol. 38(2), 1995, pp. 383-407.

to "wrap themselves in the flag", the American flag in this case.

Why? The interest of Congress and the Department of Commerce in protecting the U.S. industry was apparent, but perhaps not very deep. So long as jobs were saved, ownership seems to have made little difference to the American government, historically. American customers were interested in input value, which meant good quality at the best price. Their embrace of imports indicates that buying American was not a motivating force. If the empirical evidence does not support the need for an American identity, what might? The strong role of the Japanese and Korean governments in building and protecting their home-based steel industries (a foreign takeover would never have been permitted) and their role in pressuring customer industries to buy from home suppliers may have influenced the outlooks of these firms.

Had the roles been reversed, American firms entering Japan or Korea would have been driven by many influences to take on local partners to make their entry feasible. It is quite possible that the Asian firm were unable to fully understand the very different attitudes of the U.S. government and American customers. It is worthy of note that no European steel companies attempted to joint venture in the U.S. Did they have no skills of note to offer, or did they see no reason to invest in U.S. facilities so long as they had the right prices?

## V. CONCLUSION

The various economic models appear to suggest that foreign direct investment in the U.S. steel industry made good sense. Threats of import restriction, a desperate need for capital for modernization, and the existing overcapacity of the industry all suggest that foreign acquisitions were economically justified. The case for using joint ventures is less clear, from a strictly economic perspective. The macro models offer little assistance. The organizational economics views of transaction cost and resource-based models accurately predict that the Asian partners offered important capabilities that were closely tied to their organizational competencies, requiring a degree of integration possible only through ownership. They imply that the American sides must have offered similar capabilities to justify using joint ventures, but offer little in the way of direct productive value to be derived from retaining the American parent companies as partners. From this, we infer that less apparently economic benefits were expected from retaining an American identity for the acquired plants. The issues of cultural and market unfamiliarity were also identified to have been critical to these decisions. There may also have been a bandwagon, or institutional, effect arising from the generally similar circumstances and the decision by the first entrant to use a joint venture. While not economically irrational, the decisions to use international joint ventures as opposed to other means of direct investment appear to be based more on the social and psychological effects of uncertainty in a novel circumstance.

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