Reflexive Manufacturing: Taiwan's Integration in the Global Economy*

CHENG-SHU KAO AND GARY G. HAMILTON

Department of Sociology, Tunghai University, and University of Washington, Seattle

Drawing on extensive interviews with the owners and managers of Taiwanese firms that we have done during the last twelve years, we offer an alternative interpretation of Taiwanese industrialization. In contrast with economists and strong state theorists, we argue that the organization of Taiwan's economy has been powerfully shaped by networks of export manufacturers whose moneymaking activities have been only indirectly influenced by macro-economic incentives and the state's policy directives. These export producers have created a system of production that is highly responsive to global demand. We call this system of production "reflexive manufacturing." Our paper traces the development of reflexive manufacturing in Taiwan and demonstrates the limited role the state played in shaping the organization of the Taiwanese economy.

* Direct all correspondence to Cheng-shu Kao, Professor of Sociology, Tunghai University, P.O. Box 831, Taichung, Taiwan, and Gary G. Hamilton, Professor of Sociology and the Jackson School of International Studies, the University of Washington, Seattle, Washington 98195, U.S.A.

REFLEXIVE MANUFACTURING: TAIWAN'S INTEGRATION IN THE GLOBAL ECONOMY

The adage, "What you see, depends on where you look," certainly applies to the disciplinary gaze given to explaining Asian capitalism. In the past two decades, the leading explanations of Asia's economic ups and downs split between market and state theories, with economists generally advocating the former and political scientists the latter. This interpretive standoff between disciplinary perspectives continues a controversy started in other sites, particularly Europe and Latin America. However, with their rapid and pervasive economic successes, the countries in East and Southeast Asia became the ideal testing grounds for theories of economic development.

In the 1970s and early 1980s, the empirical observations of economists seemed most persuasive. Some economists made bold statements about the developmental inevitability of free markets, while most area-oriented economists (Little 1979; Scitovsky 1985; Kuo, et.al. 1981; Galenson 1979) gave nuanced explanations that included political and social factors, but that nonetheless focused squarely on macro-economic data interest and inflation, per capital income, total factor productivity, bilateral trade flows, and so forth.

With the publication of Chalmers Johnson's influential book on MITI (1982), the point of view began to change. Johnson persuasively argued that Japan's economic success arose, not because of free markets, but rather because of the state's careful planning and its capacity to implement those plans within the economy. Johnson's book was followed by a number of important works that generalized his conclusions to other political regimes, particularly those in Asia. In fact, with the work of Cummings (1984), Deyo (1987), Amsden (1985, 1989), Woo (1991), Wade (1991), and Evans (1995), South Korea and Taiwan became the epitome of the developmental state, and other regimes, even the Japanese one, were seen as less successful versions. Like the economists before them, these political scientists developed nuanced explanations that included a range of other non-political factors, including social and economic ones, but their disciplinary gaze remained centered on the "primacy of politics, as carried out most particularly by a nation's governmental bureaucrats and technocrats" (Pempel 1999).

Market economists focus on macro-economic patterns and political economists on regime characteristics and industrial policy. Although other factors enter into their explanations at the periphery, what they see is largely a function of where they look. Strangely, however, neither set of theorists look squarely at what is, ostensibly, the object of their investigation--the industrializing economy itself, particularly how the economy is organized and how it operates. In his meticulous analysis of the state's role in creating Taiwan's industrial economy, Robert Wade (1991, 70) confesses this exact point:

I should stress that the organization of firms--their size, the way they grow, their methods of doing business, and the relationships between them--is a major gap in the argument of this book. Any discussion of an economy's development should give a central place to the organization of firms and industries. But since little evidence is available on this subject for Taiwan, and since my primary interest is the uses of public power,

I say little more about it.

Both market and state theories of Asian industrial growth presuppose, respectively, that global market forces and the economic policies of strong states effectively create a society's industrial organization, which in turn leads to economic performance as measured by rates of growth. In the recent Asian business crisis, the same pattern of explanation continues: Macro-economic forces (e.g., exchange rates and money flows) and cronyism in political regimes were offered as the effective forces causing economic decline, but what suffered and often went bankrupt were the businesses themselves. In explaining both the rise of and the later crisis in Asian economies, the organization of the economy, the intermediate variable, is left unexamined, is taken for granted and effective outcome of the primary causes.

A third group of researchers has been examining the organization and operation of Asian economies. Very broadly, these writers engage in what is known as institutional analysis, but their perspectives range broadly from political economy (Evans 1995; Fields 1995; Haggard, Maxfield, and Schneider 1997) to economic sociology (Kim Eun Mee 1998; Kim Hyuk-Rae 1993, 1994, 1998; Lew 199x; Orri, Biggart, and Hamilton 1997; Whitley 1992, 1999) and economic geography (Mitchell 1995; Yeung 1997, 1999; Yeung and Olds 1999). Although this institutional perspective concentrates very broadly on economic organization, particularly on such topics as governance, these writers rarely examine, for the economy as a whole, the organizational qualities of interaction among firms. They prefer instead to look at the institutional background rather than at the organizational foreground.

In this paper, we suggest that the organization of market activity should not be seen exclusively in terms of background institutional factors or as the exclusive outcome of either state or macro-economic forces. Instead, our view is that the organization of economic activity has emergent features that are not fully accounted for by exogenous factors (such as state power or macro-economic forces) or by background institutional features of society (such as family and kinship institutions). Instead, we conclude that such exogenous institutional factors are socially constructed and reconstructed in the context of on-going action, which is intrinsically shaped by the organization of interactions. In other words, the past, as well as the future, only has relevance in the context of present action.¹

Using this organizational perspective, we want to rethink the fundamental structure of Taiwan's economy. We will focus not on industrial policy, financial flows, or political and social institutions, but rather on the Taiwanese entrepreneurs themselves, their firms, and their interpersonal networks. Using this focus, we can see the organizational characteristics of this economy and can understand the dynamics of this economy apart from other factors, all of which are important in the mix, but none of which explain how the economy grows and changes over time.

¹ This premise is a foundational element in the work of such pragmatist social scientists as Mead (1932) and James (1902), and has been reconstructed somewhat for use in modern social science by Giddens (1976) and others (Strauss 1991). Although philosophically sound, this premise has little relevance in empirical research because most social scientists do not use frameworks that are sufficiently organizational, both elements that are necessary to capture the contingent, developmental, and emergent qualities of social action.

For this analysis we draw on the intensive interviews done over a twelve-year period by the research teams of the Institute of East Asia Societies and Economics (IEASE) at Tunghai University in Taiwan. These teams interviewed over 600 Taiwanese entrepreneurs who own or manage firms in Taiwan and China. Over fifty entrepreneurs were interviewed several times. Most interviews lasted for more than two hours and some lasted over four hours. All the interviews have been transcribed.²

Since these interviews cover nearly a fifteen-year period, we cannot treat them as a sample on which we can perform statistical tests. Indeed, it is difficult statistically to compare the same firm at two different points in time, because except for continuity of owners, some radically changed products, networks of colleagues, locations of manufacturing, and nearly everything. More fundamentally, the firm is not the basic unit of the economy, as the corporation appears to be in the United States. In Taiwan, all firms, of whatever size, are embedded in networks of other firms. Therefore, in order to understand the organization of Taiwan's economy, it only makes sense to examine how firms operate in a network of other firms and how changes occur over time in qualitative terms and from the point of view of the firm owners. In this paper, we will refer to our interviews in general terms, either citing work that has concentrated on subsets of the interview material or giving examples from the firms we interview.

Using these interviews as our point of entrance into Taiwan's economy, we will show that Taiwan's export-oriented entrepreneurs organized their early participation in Taiwan's economy through the medium of family-owned small and medium-sized firms. They had little direct assistance from the state, although indirectly the state provided infrastructure and upstream supplies (such as electrical energy and petroleum), and some state policies (such as land reform in the mid 1950s) unintentionally contributed to economic growth in the 1960s. These entrepreneurs also had very little direct assistance from large Taiwanese businesses, some of which received government subsidies. In the early years, several levels of economic players (e.g., small and medium-sized firms, big business, state-owned enterprises) coexisted with very little direct interaction among the levels. It was not until the late 1970s and early 1980s that a more or less integrated economic system emerged, a system in which all the economic levels began systematically to interact. It was at this time that the small and medium-sized firms became the tail that wagged the dog, the productive force around which the rest of the Taiwanese economy became progressively more organized. The large firms began to target the input needs of the small and medium-sized firms, and later the state planners fell in line and also began to support the infrastructure and financial needs of smaller firms. The small and medium-sized firms retained relative independence, while the rest of the country became increasingly intertwined with their needs.

In the early years, though, owners of small firms initially drew on their social relationships to develop manufacturing networks that could effectively produce batches of goods on demand. From these beginnings, Taiwan's entrepreneurs began, aggressively and with

² The paper is part of a book project in which the two authors are engaged. Because of space limitations, in this paper, we use very few quotations for the interviews. For a fuller description of these interviews and for other analyses of SMEs based on these interviews, see Chen 1994, 1995 and Kao 1999.

increasing sophistication, to position themselves in the global economy as specialists in OEM (original equipment manufacturing) production of components and whole goods that were distributed and merchandised globally by non-Taiwanese firms. Because this system of production responds directly to external orders for goods and adjusts its production capabilities accordingly, we call this system of production "reflexive manufacturing." It is our conclusion that the state had very limited direct influence in creating this system of production, but once it became a going concern, the state then adjusted its goals and altered its own directives to complement and further rationalize this system of production. Our paper recounts the rise and rationalization of Taiwan's system of reflexive manufacturing. In order to have a better understanding, we have to put this developmental process back into its historical context.

THE RISE OF SMALL AND MEDIUM-SIZED ENTERPRISES (SME) IN TAIWAN: THE IMPORTANCE OF THE INITIAL STAGE

The fundamental importance of SMEs to Taiwan's economy could not have been anticipated in the early years after World War II. The legacy of the Japanese colonialism was a dual economic structure. The large Japanese-owned *zaibatsu* dominated Taiwan's predominantly agricultural economy from the beginning of the colonial period in 1895 until its demise in 1945. Outside the state-owned sector were small Chinese-owned businesses, which were relatively unimportant producers of manufactured goods in Taiwan. In this regard, they were much like small businesses elsewhere in the world economy in the immediate post War period. In 1945, China's Kuomintang government simply took over the large firms that the Japanese created and made them the foundations of a large state-owned segment of the Taiwan economy, a segment that continues strongly today. In 1948, fleeing from Communist victors, the Kuomintang government retreated to Taiwan and began a nearly twenty-year effort to return its military forces, consisting of a standing army of 600,000 men, to Mainland soil.

In this period, roughly from 1948 to 1968, the nationalist government's primary goals were political and not economic. Stability in Taiwan was the first priority, and the government used repression to attain that goal. State-directed resources for SME development were non-existent. Through their connections to the government and their domination of the Kuomintang, Mainlanders controlled access to state resources, and some of these connections were instrumental in starting a few large businesses, particularly party-owned businesses in communications (e.g., newspaper, radio, and television). Also, a few entrepreneurs with state backing, such as Wang Yung-ching, the founder of Formosa Plastics, started import substitution manufacturing.

On the whole, however, the government's expensive military and foreign policy reduced the amount of resources that could be used for the development of the domestic economy. The main substantive economic goal in the 1950s was to create a self-sustaining rice-based system of agriculture, which would be needed in the event of war and blockades. Invoking

the people's livelihood doctrine (*mingshengjuyi*), which is one of Sun Yatsen's People's Three Principles, the Kuomintang government stressed relative equality within society and limited monopolistic tendencies in the private sector. To this end, the government embarked on land reform, reallocating land to small farmers who actually tilled the soil in exchange for non-controlling shares in a few large party-owned and state-owned enterprises given to former landowners.

Land reform created an agriculturally based freeholder economy, in which individual households could decide what crops to grow and how to allocate labor and capital. Although rice remained an important staple, farmers also began to raise other types of cash crops, so much so that agricultural products became Taiwan's principal export sector in the 1950s, a trend that continued through the 1960s as well, particularly during the Vietnam War, when Taiwanese farmers were one of the primary suppliers of fresh agricultural goods for the American forces in Vietnam (Ho 1978, 198-200). "We raised lettuce," one person recalled, "but we didn't eat it."

The reminiscences of some of the earliest successful entrepreneurs make it clear that one of the unintended consequences of land reform was to nurture a densely networked local society. The Kuomintang encouraged local networks by establishing rural cooperatives and local party organizations, both of which many farmers joined. At the same time, the Kuomintang removed the former landlords from economic as well as political power. This reform was a move to consolidate their power at the local level, but it actually encouraged factionalism. Although the Kuomintang encouraged local networks, the state gave no support for non-agricultural pursuits. Nonetheless, people in rural areas began to explore other ways to expand their ability to make money beyond farming. We heard many accounts of how the earliest entrepreneurs, often the sons of farmers, had migrated for a time to nearby cities to learn skills that later became instrumental in starting their own businesses in the countryside. The capital used to start these new businesses usually came from their savings and from family members or friends engaged in part-time farming. Our interviews largely correspond to Tai-li Hu's account (1984) of her mother-in-law's rural village, Liu Ts'o, where no firms were started during the 1960s, but where many villagers had gained sufficient skill in nearby Taichung City to return to Liu Ts'o in the 1970s to establish, "all of a sudden" (Hu 1984, 2), 20 small-scale factories. Indeed, Ho (1979) makes the claim that throughout Taiwan, rural industrialization was an extraordinarily important feature of Taiwan's economic development. Our interviews make it clear that the earliest entrepreneurs, in Taichung City in the 1960s and throughout the entire region in the 1970s, relied heavily on raising capital and recruiting labor from the social networks that developed in the aftermath of land reform, a point also acknowledged by others as well (Ho 1978, 172-74; Speare 1992; Liao and Huang 1994).³ These networks based on locale and kinship enabled

³ Hu (1984, 212) argues, however, that in her case study "the capital accumulated for the development of rural small-scale industry was not mainly from agriculture." Our interviews indicate that, although rural-based capital accumulation might have been modest, the use of rural resources, including the land and labor of those living in the countryside, was substantial and facilitated the rapid growth of industries that occurred in the 1970s and early 1980s.

the agriculturally based rural society to generate enough resources for a few entrepreneurs to start modest businesses in the late 1960s and early 1970s. By the mid 1970s, these early beginnings mushroomed into a full-scale manufacturing boom, a boom that would transform Taiwan's local society.

The backdrop to this manufacturing boom was the transformation of Asia's role in the global economy. Deeply involved in the Korean War as well as the Cold War, the United States encouraged Japan to rebuild their economy after World War II using exports to global markets as the basis for their re-industrialization. Japanese businesses, particularly the trading companies, quickly renewed ties to Taiwan,¹ and agriculturally rich Taiwan began to export food products to Japan. In addition, a few large Japanese electrical appliance firms began to do some subcontracting in Taiwan (Gold 1986). About 50 percent of Taiwan's very modest exports during the 1950s went to Japan (Ho 1978, 392). By the late 1960s, the Vietnam War had further increased U.S. involvement in the region and encouraged wholesale buyers to locate products in Asia for sale in the United States and Europe. In part stimulated by the availability of high quality manufacturing in Japan and Hong Kong, retail outlets and mass merchandisers in the United States and Europe discovered that they could buy set amounts of manufactured products (e.g., garments, toys, and consumer electronics) in East Asia for resell elsewhere. This period marked the beginning of OEM production in Asia.

Taiwan's export economy took off in the 1970's. This initial stage of industrialization is tremendously important, because it shaped the basic structure of the Taiwanese economy and set the economy on a trajectory of development that continues today, thirty years later. Export production started in agriculture and textiles but quickly expanded to other areas. Small and medium-sized firms began as the primary manufacturers for exports. These firms could buy some of their inputs from Taiwan's import-substituting large firms that had been subsidized by the government, but they also bought inputs from Japan and the United States as well. Our interviews are clear on one point, unlike Amsden (1985) and Evans (1995) have suggested, there was never a formal or even long-term informal relationship between the upstream producers of intermediate goods, such as the producers of plastics and textiles, and the SMEs, the producers of finished products. Even though the SMEs needed these intermediate goods, they would happily buy from anyone offering them the right combination of price, quality, and availability. The success of the SMEs depended on their autonomy from large upstream firms and the organizational flexibility in linking with each other.

From the beginning, small trading companies, each consisting of only a handful of employees, brokered deals between foreign buyers and local networks of SMEs. The research teams at IEASE interviewed about forty entrepreneurs who started or managed such trading companies (Chen 1994). The interviews revealed that most owners of trading companies have a modest education and are able to speak a little English. Many of

¹ The Korean War limited products that Japan could buy from Korea but at the same time increased the demand for exports. In the postwar period, the Japanese trading companies quickly reentered the Taiwanese country, but in part because of the war and in part because of the lingering animosity from the colonial era, Japanese trading companies were less successful in Korea.

these entrepreneurs, sometimes with no advance contacts, simply went on the road, sample suitcase in hand, going from one wholesale firm to another in the United States and Europe. The trading companies they owned were known colloquially as *piban gungsi*, "suitcase companies." The entrepreneurs served as compilers of information about trends in consumption, collectors of samples for reverse engineering, and as matchmakers between foreign buyers and local manufacturers. Once they had orders in hand, the traders actively participated in establishing manufacturing networks for the ordered products. Even though entrepreneurs drew on their social relationships, the production networks they put together were temporary, functioning only as long as the contracts lasted. As such, the networks were not static, rather their composition changed dramatically over time. As orders increased, the organizing entrepreneurs would increase their production by subcontracting parts of the manufacturing process to others. Building around production, the networks grew more complex as the production became more complex. Networks segmented and proliferated, with some specializing in one type of product or a specific type of manufacturing process (e.g., metal working). Geographic concentrations grew. For instance, in the area around Hemei, in central Taiwan, hundreds of firms participated in the manufacture of cotton textiles and garments (Chen, Chieh-ying 1997). In Chiayi, in southern Taiwan, the six hydraulic jacks plants located there dominated the world's production of hydraulic jacks.

This model of doing business was easy to learn and easy to adapt to the manufacture of most types of products. Entry for bottom-end subcontractors was easy and required little capital. Once the process of manufacturing was mastered, a subcontractor could venture out on his own, finding a new product to make or a better way to make an existing product. Hence, once this model of doing business was a proven success, foreign buyers began to seek out manufacturers to make the products that they wanted to merchandise. Trade shows set up by the government helped to showcase selected firms, but the real links between global demand and local production were the thousands of small trading companies and entrepreneurs willing to go out and find buyers (Levy 1988).

By the late 1970s, an accelerating and self-reinforcing cycle of production had begun, fed in large part by the accelerating retail boom in the United States. By this time, the Vietnam War had ended and mass merchandising of brand-name products had begun in earnest. Many people nowadays forget that the most common brand names for consumer non-durables date only from the 1970s. Such footwear companies as Nike and Reebok and such clothing companies as Esprit, Ann Klein, and The Gap began in the 1970s as manufacturers without factories, and as designers and merchandisers they subcontracted the manufacture of their brand name goods. Gary Gereffi (1994) terms these merchandisers and mass retailers "big buyers," and calls the types of manufacturing arrangements they established "buyer-driven commodity chains." From the outset of their deployment, Taiwan, Hong Kong, and South Korea had very large shares of the big-buyer subcontracts. When such buyer-driven chains proved fabulously successful, Taiwan's manufacturing model became self-perpetuating.

Whether successful or not, Taiwan's entrepreneurs drew on their knowledge of everyday society to create their production networks. The knowledge they used to make the economy work was the tacit social knowledge they already possessed. At least initially, they needed little special training to become entrepreneurs. They had, most of all, to know how to "do society." This outcome was neither an intended consequence of government officials, who let local society alone as long as there was stability and not too much speculation, nor an intended outcome of Taiwan's big businesses, which increasingly oriented their own business strategies to fulfilling the demands created by export-driven SMEs. Instead, the network organization of Taiwan's economy rested squarely on the patterns of activity reconstructed from the patterns of Taiwan's local society.⁵

THE ECONOMIC ORGANIZATION OF THE SMES: THE CONNECTIONS OF GLOBAL ECONOMY

It would be a mistake, however, to conclude that the organization of Taiwan's economy is due simply and entirely to its embeddedness in Taiwanese society. Social institutions certainly shaped these networks by giving them everyday social meanings as well as a style-of-life orientation (Chen 1994, 1995). But when these networks became the medium of a system of production that could successfully compete in the global economy, the network organization grew increasingly economic and increasingly directed towards improving the global competitiveness of entrepreneurs. The interviews with entrepreneurs make this point very clearly: They are not in business in order to "do society" (i.e., "to be sociable"), but rather they were "sociable" in order to make money from their business. They are businesspeople first and foremost, and as businesspeople, they are not only socially embedded, but also economically embedded in a system of production in which they are players and in which they can be entrepreneurs, but over which they have very little control.

Seen in this way, the network organization of the Taiwan economy has two levels of activity: the activities of entrepreneurs and their firms and the activities of networks. Entrepreneurs and their firms are not autonomous actors, but rather are collective players in a system of production, a system they helped create and of which they are a product. Socially, such firms are, *ipso facto*, family firms because these entrepreneurs are part of a society in which family and kinship relationships form the organizational medium by which all activities outside of the state sphere are organized (Fei 1992; Hamilton 1999). The heads of such businesses are *laoban*, a word conventionally translated as "boss." But *laoban* means more than a boss; it means the person in charge. The head of Formosa Plastic is a *laoban*, as is the owner of a peddler stand selling "rotten" tofu. The *laoban* of a business is the counterpart of the head of household (*jiachang*), and in fact the person in charge of the business is usually the acknowledged head of

⁵ For an extensive analysis based on the interviews done by the Tunghai team, see in particular the two books done by Chen (1994, 1995), which reached this same conclusion as well.

household. Therefore, business decisions are often family decisions, as Kao (1999) has demonstrated in his study of the importance of the "boss's wife" (*laoban niang*) to the everyday operation of entrepreneurial firms, large as well as small. But a full understanding of how these firms actually operate and transform economically is only achieved by examining how they become part of a system of production.

In order to survive economically, entrepreneurs must be socially and normatively connected to each other and more importantly, their firms must be integrated into one or more production networks. We have spent many years, through observations and interviews, trying to understand how these networks operate as economic organizations. Looking at the networks from the entrepreneurs' point of view (including that of the bosses' wives), we see that family units constantly learn and relearn how to be a part of production networks. Being in a network, or networking, is a process rather than a state of being. Networking is part of a constantly changing economic world in which networks are dynamic vehicles through which productive activity is carried out.

We have come to see these networks as "functional hierarchies." The social counterpart of these economically oriented and often very specialized hierarchies is the continuing round of banquets in which all the *laoban* engage: The inviter hosts the meal for the invited, and all eaters observe the etiquette of the round table, where equality and hierarchy are subtly blended. Similarly, most production networks consist of firms that have been invited to participate. The networks form around the manufacture of a product. Typically, the inviting entrepreneur, often but not necessarily connected to a trading company, organizes a production network, which is made up of independent firms. Each firm corresponds to the actual requirements to manufacture a specific product. Some firms may be large, some medium, and some small, depending on the inputs and manufacturing sequence. Even though in reality inequalities among entrepreneurs may be considerable, in a formal sense, every firm in the network is independent and every *laoban* an independent operator. However, for each production network, there is an organizer, who invites others in, who serves as a host, who coordinates the activities of the network, and who serves as the person in charge.

For products having large and long-term orders, manufacturing networks typically grow better at networking and often are quite stable over time. Firms increase their technological sophistication; inefficient firms are weeded out tactfully, and more efficient firms are integrated into the network. For short-term orders, production networks form and reform around each new order and each new product being produced. Network organizers also shift over time. Having experience as a subcontractor, an entrepreneur may try his hand at organizing a new production network around the same or similar products. Viewed from the standpoint of the economy as a whole, the dynamism and flexibility of the Taiwanese economy is easy to understand. The ability of the Taiwanese economy to respond quickly to changing global demands, to be reflexive manufacturers, was present early in Taiwan's economic development.

The networking dynamism has internal as well as external causes. The internal causes arise from a tendency of economic networking to incorporate new firms in expanding

areas of production (often through subcontracting and outsourcing) and to diversify across product areas as demands change. The proliferation of firms leads to product development and product differentiation. In fact, the level of product diversification in Taiwan's economy is nothing short of amazing (Feenstra, Yang, and Hamilton 1999), even when compared with much larger economies, such as South Korea and, for some product areas, even Japan. It should be noted that government support is not among the internal causes. The government has provided the SMEs no protection, few privilege, and little guidance. The government has provided a friendly environment and limited support for the development of selected upstream and midstream industries. But SME's export successes, their organizational flexibility, and their manufacturing capacities cannot be adequately explained by policy directives or by the actions of government technocrats, however competent they may be (Hamilton 1997).

The external causes of Taiwan's networking flexibility and dynamism are equally important to, and complementary with, the internal ones. These causes are directly linked to the global economy and to the rationalizing pressure constantly placed on the organization of the economy. We can understand the pressure towards rationalization by understanding price structure within which Taiwan's networks function. Although the entrepreneurs may want to increase their profits over the long term, the real pressure to rationalize production networks usually comes from the big buyers, who find themselves in global competition with other merchandisers offering similar products. The big buyers constantly squeeze production networks with each new round of orders, and the functional hierarchies respond by further rationalizing their production chains. In this sense, networking and price structures are intimately linked and integral to the same economic system. As we will discuss in the next section, production networks frequently reach a point where no further systemization will allow the networks to reach the price targets set by outside buyers within an acceptable level of profit as demanded by participating firms and an acceptable level of quality as demanded by buyers. At this point, networks collapse and are only reestablished under very different circumstances, such as producing different products or producing the same products under very different conditions of production.

THE POST-PLAZA ACCORD TRANSFORMATION OF TAIWAN'S ECONOMY

In the 12 years between the signing of the Plaza Accord in 1985 and the onset of the Asian business crisis in 1997, Taiwan's economy was transformed. In this period, Taiwan went from being one of the world's leading exporters of footwear and garments to an economy that exports very little in the way of either product (Hsing 1998; Gereffi 1994). In the same period, Taiwan became one of the world's leading manufacturers of an amazing array of high technology products. From the late 1980s to early 1990s, Taiwan also experienced a severe crisis and emerged from that crisis as one of the

world's most resilient and dynamic economies, an economy specializing in reflexive manufacturing. It was this reflexivity that allowed Taiwan to emerge relatively unscathed from the 1997 crisis that forced most other Asian economies into near bankruptcy.

In the twenty-year period between the late 1960s and the late 1980s, Taiwan's economy flourished. Early on, OEM manufacturing was very profitable and an exceedingly wide range of products came to be manufactured in Taiwan's production networks. As the years passed, the production teams had to work harder and harder to maintain the same level of income. Networks could only absorb so many accelerating demands from the global markets. And within Taiwan, every successful sector of production had also generated many competing networks, which, when added to competition from other locations in Asia, only made matters worse. Production networks could not indefinitely cushion declining profits.

This complaint about declining profits and unending work were ubiquitous themes from our interviews during this period. But other factors influenced Taiwan's economic environment at this time. By the late 1980s, demographic changes in Taiwan's society were having a full effect on its economy. Family planning had been so successful that the birth rate dropped precipitously. At the same time that the birthrate was falling, the government extended the length of mandatory education through 12 grades, further keeping people out of the labor force, and those entering the labor force with education often wanted new types of jobs. Accordingly, the labor market tightened as fewer and fewer young people entered the labor force at the bottom rungs. Additionally, the government directives banning the entry of foreign laborers did not help to alleviate the problem. The rate of unemployment reached the lowest point ever just as the demand for cheap labor increased.

After years of running trade deficits with Korea, Japan and Taiwan, the United States negotiated a currency reform measure and, in 1985, all parties signed at the Plaza Hotel in New York City. The Plaza Accord, as this currency reform became known, removed the pegged trading range of East Asian currencies with the U.S. dollar and allowed the Asian currencies to appreciate. In a year's period, Taiwan's currency moved from 40 New Taiwan dollars to 1 U.S. dollar to 27 New Taiwan dollars to 1 U.S. dollar. The reevaluation had an immediate effect on the cross-market price structure within Taiwan's economy. Momentarily everyone was much richer as computed in U.S. dollars. The price of imports fell considerably, and local consumption and styles of life rose quickly. Real estate prices, which had been rising, now took off, and money poured into property construction. Stock market speculation also increased.

After a short lag time, however, the cost of labor in Taiwan grew prohibitively high and accordingly Taiwan exports became more expensive on world markets. By the late 1980s, the real estate bubble burst, the stock market collapsed from a high of about 14,000 to a little over 2,000, and rising exports began to taper off. Suddenly, in 1988, Taiwan's outward investment skyrocketed. In a two-year period, 1988-90, Taiwan's most profitable manufacturers--those specializing in footwear, textiles, and garments--were out of business or moved the site of their assembly operations to China and Southeast Asia. Those entrepreneurs who stayed in Taiwan began to look for new

products to manufacture.

Our interviews reveal that the initial impetus to relocate the site of manufacturing came from the big buyers (i.e., brand manufacturers, such as Nike, and mass retailers, such as Home Depot), who told their manufacturers to move or lose their contracts. There was no government policy that encouraged this movement or assisted it in any way. Quite to the contrary, the government forbade the transfer of funds to the PRC. The owners of the SMEs, however, openly ignored the governmental restrictions and moved huge amounts of capital, machinery, and intermediate inputs to China by transshipping them through Hong Kong. Once a core group of entrepreneurs began to move, every competitor and would-be competitor also had to move. The interviews show that, win or lose, most entrepreneurs felt they had no choice. An SME stampede to China ensued, and as soon as the SMEs had established a China beachhead, some of Taiwan's large firms, supplying intermediate inputs to the small firms, began to set up subsidiary firms in China, too. Having greater control over large firms, the government, however, was able to block many large firms from moving.

Once in China, Taiwanese entrepreneurs found they could not duplicate the production networks they had had in Taiwan. Similar to Hsing's findings (1998), our interviews with Taiwanese firms in Guangdong Province show that they were forced to integrate many of the operations in the transplanted firm that had been done formerly by independent firms in the network. Quite a few entrepreneurs, especially those making footwear and garments, had to establish factories in China many times the size and employing many times the workers than they had done in Taiwan. The scale of production meant that they needed massive amounts of intermediate inputs, much of which they continued to buy from manufacturers in Taiwan. Accordingly, Taiwan's exports to Hong Kong and then transshipped to China zoomed upward. Many firms kept their headquarters in Taiwan, had their manufacturing sites in China, and shipped their exports out to the rest of the world from Hong Kong.

THE TRANSFORMATION OF TAIWAN'S REFLEXIVE MANUFACTURING

This hollowing out of the Taiwan economy in only a two year period did not, however, spell an end to Taiwan's manufacturing boom, as one might have predicted it would. Instead, after a downturn of several years, Taiwan's manufacturing exports resumed again, more strongly than ever. How can the resumption of, and even increase in, Taiwan's manufacturing prowess be explained? We believe that Taiwan's reflexive manufacturing system best explains this remarkable restructuring that has occurred in the last decade.

Interviews show that Taiwan's entrepreneurs followed one of two strategies to upgrade their businesses. First, many entrepreneurs simply did not want to abandon their homes and their families to establish new factories overseas. They decided to remain in Taiwan making the same products, but now targeting the very high end of the market. Where

one firm had been making bicycles for mass consumption, it now began to make titanium and carbon composition bicycles for select enthusiasts who would pay premium prices.

The second strategy for many organizers of manufacturing networks, especially those in traditional labor-intensive industries, was to split their business into low-end and high-end segments. They moved low-end labor-intensive segments to areas outside of Taiwan, and resumed production on existing or new contracts in the new location. For the high-end segment, they typically tried to move production to a higher level of quality with more capital intensity than was the case previously. This often meant that they needed to find some new products to make, which were hopefully not totally unrelated to the previous products. They wanted to retain their manufacturing expertise but find a new market in which they could excel. One entrepreneur described his efforts as a "search and discovery mission." Entrepreneurs would read trade magazines and go to trade shows. They would travel to their markets in the United States and Europe to get ideas. Once they hit upon a new product, they would recombine previous resources, put together a new production network, reinvest their own money, and then begin again. In this search and discovery, one entrepreneur, who had made shoes for twenty years, ended up successfully making high-end craft tools. Another entrepreneur, who had made model airplanes as toys, began making turbojets for foreign governments. In more than a few cases, however, entrepreneurs decided just to close their businesses, usually without formally claiming bankruptcy. They sold their property and used the money to invest elsewhere.

In the late 1980s, a new period of rapid growth began, this time in high technology industries. The entrepreneurs creating these new industries were a new group of people quite different from the first round of entrepreneurs. These were more highly educated, many receiving their education in Taiwan, but an important few had gone to school in the United States, had worked in Western high technology firms, and then moved back to Taiwan to start businesses or manage existing ones.

This new set of entrepreneurs built on a previous high technology industry that had arisen in Taiwan in the early 1980s, but that had remained small and relatively unsophisticated. According to the accounts that these entrepreneurs gave us, the PC industry in Taiwan developed accidentally and with no direct assistance from the government. The government indirectly helped, however, by banning the manufacture of gambling machines. With the government prohibition, those firms that had been making these machines needed to find something else for its production network to manufacture. Drawing on their expertise, they decided to make PC clones and copies of Apple II. When asked how he could make a computer from scratch, one entrepreneur replied with the Chinese saying, "We have no experience with horses, but we have ridden a donkey." From this beginning, the PC factories in Taiwan grew to become the main OEM suppliers for such American PC computer companies as Compaq and Dell. Taiwan is now the third largest manufacturer of PC related products, behind the United States and Japan.

The new beginning for the high technology firms occurred in the early 1990s. Demand

in the United States for computer components and peripherals was high, and many U.S. firms were in hot competition with each other to offer the latest PCs to consumers who were just developing an appetite for fast computers with lots of memory. The area of deepest concentration of software and hardware producers was in Silicon Valley. Saxenian (1994, 1998) shows these producers were highly networked, and from the beginning Taiwanese and Chinese American entrepreneurs had an important presence among Silicon Valley firms. Many of the hardware firms were eager to locate high quality and low cost OEM producers for components that had very rapid product cycles. Drawing on their connections in both California and Taiwan, a number of Chinese high technology engineers started manufacturing firms in Taiwan, many adjacent to one another in the Hsinchu Science-Based Industrial Park.

At this time, in the late 1980s, Taiwan had no silicon wafer semiconductor factory. The Taiwan government decided Taiwan's economy needed to be competitive in high technology industries, but did not want to compete head on with firms in the United States and Japan. Private entrepreneurs (Morris Chang, a former executive at Texas Instrument, being the most prominent one) persuaded government officials to follow the pattern of other large firms in Taiwan, namely to be upstream providers of intermediate inputs that SMEs could then use to manufacture exports. Joining with Philips Electronics, the government established Taiwan Semiconductor Manufacturing Company (TSMC), the world's first dedicated independent semiconductor manufacturing foundry. A semiconductor foundry is simply an OEM manufacturer of semiconductor chips designed and merchandised by other firms, in much the same way that garments and footwear had been in Taiwan. In fact, TSMC's charter prevents the company "from designing or making our own brand-name IC products. TSMC therefore is a partner, not a competitor with other semiconductor companies." (TSMC Annual Report 1998, 7)

TSMC's success epitomizes Taiwan's new surge in reflexive manufacturing. From the beginning, TSMC began to work cooperatively with small chip design firms that would create special purpose chip sets for export products. The design firms, in turn, worked with export manufacturing firms, some located in Taiwan and some elsewhere. The key feature of the semiconductor foundry business is its integration into a manufacturing system whose foremost characteristic is its quick response to external demand, the essence of reflexive manufacturing. The approach proved successful, and soon other entrepreneurs started foundries in competition with TSMC. The foundry business took off. Today, semiconductor foundries form an extremely important segment in global high technology development, in which Taiwanese foundries have a commanding lead, producing over 80 percent of the global demand in foundry-made chips. With foundries, every high technology firm can have their own "virtual fab." They can be designers and merchandisers of products that they do not produce. Increasingly the global high technology industries are becoming "buyer driven chains," and increasingly Taiwan's organizational capacity for reflexive manufacturing has pushed global high technology in this direction.

Besides the big semiconductor companies, other PC and PC related high technology industries share the similar characteristics of reflexive manufacturing as well. Although

they are new firms, we also see many continuities in the patterns of network production between the newer and the older industries. We want to be clear here: Taiwanese high-tech companies are not organized in exactly the same manner as they were with footwear and other similar products. Nonetheless, decentralized but well-connected production networks serve as the basic organizational pattern in both the new and old industries. Businesses in Taiwan are accustomed to decentralized networking instead of vertical integration. The major difference in the high technology industry is that the entrepreneurs are more highly professionalized than they were in the previous networks of *laoban*. Notwithstanding this difference, it is still apparent that there is an affinity between the global high technology industry and network production systems. It is not surprising, therefore, that Taiwanese manufacturers played such an important part in the formation of this industry. The Taiwanese entrepreneurs have mobilized the existing local conditions and efficiently integrated them into the global division of labor. They are able to achieve mass production and flexibility simultaneously. It is the transformed network production system that makes reflexive manufacturing possible and successful.

A final word is needed about the role of the state in the development of high technology industries. Unlike in the older industries, in the new high technology industries the state plays a more active role, but that role is still largely restricted to providing infrastructure, for instance in the form of developing science parks, and investment capital for large, capital intensive endeavors that serve as upstream suppliers of intermediate inputs for export manufacturers. In this role, the Taiwanese state does not act like the mythical "developmental state" so often discussed in the literature, but rather reacts to, and is merely a sustainer of, the reflexive manufacturing system that is well institutionalized and that powers Taiwan forward.

CONCLUSION

What you see depends on where you look. In this paper, using the insights we have gained from twelve years of intensive interviews, we have looked at the organization of Taiwan's economy from the point of view of those who organize it, the entrepreneurial owners and managers of firms. Based on our interviews, Taiwan's entrepreneurs do not see the government as their partner. State planners are often more than willing to take credit for Taiwan's spectacular industrial successes, and some are even willing to call Taiwan's capitalist transformation an economic miracle. But the entrepreneurs interviewed by the research teams at IEASE never used the word "miracle" to describe what they have done and they see very little governmental effects on the products of their labor. Most entrepreneurs ignored government programs and complied with government regulations only if it was convenient to do so. Their world is a world of business and for them the government is largely outside of this world, and is certainly not its shaper.

Analyzing their words and actions, we have come to understand that the entrepreneur's

world is complexly organized, and that the government has very little role in shaping it. The organization of Taiwan's economy is shaped by the social and economic life of those who run it. It is a world that runs by socially interpreted rules of family and friends, but it is also a world that is thoroughly economic and calculable in those terms. There is no boundary between the social and the economic; the boundary is kept purposefully ambiguous. Both the social and economic worlds are intimately and intricately bound up in one reality. That reality is grounded in the routines of everyday life and thus is distinctively Taiwanese. It is also historical in that it has evolved and grown over time. But it is also a reality that is now intertwined in global economic forces, which the Taiwanese entrepreneurs were active participants in creating, but over which they, as individuals, have very little control. For them, the market is not an invisible hand that works automatically towards beneficent ends. Instead, the market is filled with real things, real products, real money, real families, real decisions, and real futures, none of which will necessarily lead to good ends. They see bankruptcies and failures, as well as wealth and successes, all around them. They know that the paths to wealth and success are the tried and tested, and have become institutionalized processes in an economic system constantly recreating itself in the light of new and ever changing ways to make money. This encompassing economic system, which constitutes the world of Taiwan's entrepreneurs, is what we have identified as a system of reflexive manufacturing. It is through this system of manufacturing that Taiwan has become integrated into the global economy.

REFERENCES

- Arnsden, Alice H. 1985. "The State and Taiwan's Economic Development." In: *Bringing the State Back In*, eds. Peter B. Evans, Dietrich Rueschmeyer, and Theda Skocpol. Cambridge: Cambridge University Press.
- . 1989. *Asia's Next Giant: South Korea and Late Industrialization*. New York: Oxford University Press.
- Chen, Chieh-hsuan. 1994. *Xieli Wangluo yu Shenbu Jiegou: Taiwan Zhongxiao qiye de Shehui yu Fenxi* [Chinese Name] [Mutual Aid Networks and the Structure of Daily Life: A Social Economic Analysis of Taiwan's Small and Medium-sized Enterprises]. Taipei: Lianjing.
- . 1995. *Heila Wangluo yu Shenbu Jiegou: Dijiang Jinrong, Zhongxiao qiye Taiwan Shishi Shehui zhi Zhuanyuan* [Monetary Networks and the Structure of Daily Life: Local Finances, Small and Medium-sized Enterprises, and the Transformation of Folk Society in Taiwan]. Taipei: Lianjing.
- Chen, Chieh-ying. 1997. "Gongyehua Chongde Chuantonghua Hemei: Fangzhiye zhi Yanzhou" [The Tradition of Industrialization Revival on the Cotton Industry in Hemei]. *Dijiang Shehui* (Local society) 1 (1): 211-54.
- Cummings, Bruce. 1984. "The Origins and Development of the Northeast Asian Political Economy: Industrial Sectors, Product Cycles, and Political Consequences." *International Organizations* 38:1-40.
- Deyo, Frederic C., ed. 1987. *The Political Economy of the New Asian Industrialism*. Ithaca: Cornell

- University Press.
- Evans, Peter B. 1995. *Embedded Autonomy: States and Industrial Transformation*. Princeton, N.J.: Princeton University Press.
- Feenstra, Robert C., Tzu-Han Yang, and Gary Hamilton. 1999. "Business Groups and Product Variety in Trade: Evidence from South Korea, Taiwan and Japan." *Journal of International Economics* 48 (June): 71-100.
- Fields, Karl. J. 1995. *Enterprise and the State in Korea and Taiwan*. Ithaca, New York: Cornell University Press.
- Galenson, Walter. 1979. *Economic Growth and Structural Change in Taiwan*. Ithaca, N.Y.: Cornell University Press.
- Gereffi, Gary. 1994. "The International Economy and Economic Development." In *The Handbook of Economic Sociology*, eds. Neil Smelser and Richard Swedberg. Princeton: Princeton University Press.
- Giddens, Anthony. 1979. *Central Problems in Social Theory: Action, Structure, and Contradiction in Social Analysis*. Berkeley: University of California Press.
- Gold, Thomas B. 1986. *State and Society in the Taiwan Miracle*. Armonk, New York: M.E. Sharpe.
- Haggard, Stephan, Sylvia Maxfield, and Ben Ross Schneider. 1997. "Theories of Business and Business-State Relations." In *Business and the State in Developing Countries*, eds. Sylvia Maxfield and Ben Ross Schneider. Ithaca, N.Y.: Cornell University Press.
- Hamilton, Gary G. 1997. "Organization and Market Processes in Taiwan's Capitalist Economy." In *The Economic Organization of East Asian Capitalism*, eds. Marco Orr, Nicole Woolsey Biggart, and Gary G. Hamilton. Thousand Hills: Sage Publications.
- _____. 1999. "Reciprocity and Control: The Organization of Chinese Family-owned Conglomerates." In *The Globalisation of Chinese Business Firms*, eds. Henry Wai-chung Yeung and Kris Olds. London: Macmillan.
- Hsing, You-tien. 1998. *Making Capitalism in China: The Taiwan Connection*. New York: Oxford University Press.
- James, William. 1997. *Pragmatism: A New Name for Some Old Ways of Thinking*. New York: Longmans, Green, and Co.
- Johnson, Chalmers. 1982. *MITI and the Japanese Miracle*. Stanford: Stanford University Press.
- Kao, Cheng-shu. 1999. *Tongia Niang*. Taipei: Lien Chin Publishing Co.
- Kim, Eun Mee. 1997. *Big Business, Strong State: Collusion and Conflict in Korean Development*. Albany: State University of New York Press.
- _____, ed. 1998. *Four Asian Tigers: Economic Development and the Global Political Economy*. New York: Academic Press.
- Kim, Hyuk-Rac. 1993. "Divergent Organizational Paths of Industrialization in East Asia." *Asian Perspective* 17: 105-35.
- _____. 1994. "The State and Economic Organization in a Comparative Perspective: The Organizing Model of the East Asian Political Economy." *Korean Social Science Journal* 20: 91-120.
- Kuo, Shirley W. Y., Gustav Ranis, and John C.H. Fei. 1981. *The Taiwan Success Story: Rapid Growth with Improved Distribution in the Republic of China, 1952-1979*. Boulder, Colorado: Westview Press.
- Levy, Brian. 1988. "Korean and Taiwanese Firms as International Competitors: The Challenges Ahead." *Columbia Journal of World Business* (Spring): 43-51.

- Liao, Cheng-hung and Chun-chieh Huang. 1994. "Attitudinal Changes of Farmers in Taiwan." In *The Role of the State in Taiwan's Development*, eds. Joel D. Aberbach, David Dollar, and Kenneth L. Sokoloff. Armonk, N.Y.: M.E. Sharpe.
- Little, I. M. D. 1979. "An Economic Reconnaissance." In *Economic Growth and Structural Change in Taiwan*, ed. W. Galenson. Ithaca, N.Y.: Cornell University Press.
- Mead, George Herbert. 1932. *The Philosophy of the Present*. Chicago: Chicago University Press.
- Mitchell, Katharyne. 1995. "Flexible Circulation in the Pacific Rim: Capitalisms in Cultural Context." *Economic Geography* 71 (4): 364-82.
- Orr, Marco, Nicole Biggart, and Gary G. Hamilton. 1997. *The Economic Organization of East Asian Capitalism*. Thousand Hills, Calif.: Sage.
- Pempel, T.J. 1999. "The Developmental Regime in a Changing World Economy." In *The Developmental State*, ed. Meredith Woo Cummings. Ithaca: Cornell University Press.
- Saxenian, Anna Lee. 1994. *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Cambridge, Mass.: Harvard University Press.
- . 1998. "Silicon Valley's New Immigrant Entrepreneurs and their Asian Networks." Paper presented at the International Conference on Business Transformation and Social Change in East Asia, May 22-23, Tunghai University, Taiwan.
- Scitovsky, Tibor. 1986. "Economic Development in Taiwan and South Korea: 1965-1981." In *Models of Development: A Comparative Study of Economic Growth in South Korea and Taiwan*, ed. Lawrence J. Lau. San Francisco, Calif.: Institute for Contemporary Studies.
- Speare, Aklen Jr. 1992. "Taiwan's Rural Populace: Brought in or Left out of the Economic Miracle?" In *Taiwan: Beyond the Economic Miracle*, eds. Denis Fred Simon and Michael Y.M. Kuo. Armonk, N.Y.: M.E. Sharpe.
- Strauss, Anselm. 1991. "Mead's Multiple Conceptions of Time and Evolution: Their Contexts and Their Consequences for Theory." *International Sociology* 6 (4) (December): 411-26.
- Wade, Robert. 1990. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. Princeton: Princeton University Press.
- Whitley, Richard D. 1992. *Business Systems in East Asia*. London: Sage.
- . 1999. *Divergent Capitalisms: The Social Structuring and Change of Business Systems*. New York: Oxford University Press.
- Woo, Jung-en. 1991. *Race to the Swift: State and Finance in Korean Industrialization*. New York: Columbia University Press.
- Yeung, Henry Wai-chung. 1997. "Business Networks and Transnational Corporations: A Study of Hong Kong Firms in the ASEAN Region." *Economic Geography* 73 (1) (January): 1-25.
- . 1999. "The Internationalization of Ethnic Chinese Business Firms from Southeast Asia: Strategies, Processes, and Competitive Advantage." *International Journal of Urban and Regional Research* 23.
- Yeung, Henry Wai-chung and Kris Olds, eds. 1999. *The Globalisation of Chinese Business Firms*. London: Macmillan.