

## **Chapter 2**

### **The Evolution of Taiwan's Economic Miracle 1945-2000: Personal Accounts and Political Narratives**

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In this chapter, we examine the contours of Taiwan's economic history as a ROC (Republic of China) province and as the seat of the ROC's émigré regime and the economic miracle that was launched with the help of the ROC's strongest ally, the United States. We meet the technocrat actors from both the ROC and the USA who helped to promote and finance the miracle and then create a consumer electronics sector that in turn helped produce a strong IT (information technology) sector. Only then can we understand the nature of the ROC's private sector move to the "open for business and investment" Peoples Republic of China of the mid 1990s and early 2000s.

We begin this overview with the coming of the ROC regime to Taiwan and end as new IT firms and other industrial firms are beginning to relocate their factories in southeast and mid-eastern coastal China

#### **I.1 Post-war Taiwan and the Birth of an "economic miracle"**

The ROC military and civilian forces took over the island from the colonial Japanese government that had ruled what had been a province of the Qing Empire from 1895 in late August of 1945. The three years that followed, the Retrocession (to use the proper KMT terminology) were marked by all too many recorded examples of how the ROC civilian officials and military forces carpet-bagged, the sins of corruption and brutality, and even rape. This was the situation that existed in 1947 when the Taiwanese revolted. That revolt, successful at first, was brutally put down after ROC negotiators had bought time by talking to Taiwanese elite

leaders. The suppression resulted in at least 10,000 deaths and result in a population that would remain large cowed and quiescent until the end of the 1960s.<sup>1</sup>

Only after the revolt of 1947 and its suppression did the ROC officials, then beginning to loose their hold of Mainland China, did realize that reforms had to be made and they were. Things began to get better as the island's economy recovered some of its former capacity and a measure of anxious calm returned.

It was during this time that groups of ROC technocrats high within the circles of the bureaucracy began to come to Taiwan to aid in the reconstruction process. A number of these men would become the core of a well trained and experienced planners and doers that the ROC's second in command, Chen Chiang, would rely upon to restructure the economy in the decades following the ROC's 1949 loss of the mainland and its governments retreat to the island.

The year following the retreat saw the new island home of the ROC regime saved from invasion by an historical event taking place a few thousand miles away. History was now favoring the defeated, demoralized and virtually defenseless Chiang Kai-shek-led regime. The American government's involvement in the defense of South Korea and its subsequent bloody and prolonged military engagement with the new Peoples Republic of China led the Truman administration to order a carrier group in Taiwan Strait and then led the US to become the protector of the ROC.

Let us flesh out this scenario out in a bit more detail. In late 1950, the UN's war in Korea moved into critical stage. The American and British forces, under the command of Douglas Macarthur, had been able to destroy the North Korean armies and advance well north in Communist North Korea's heartland only to meet the PRC's Peoples Liberation Army that had

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<sup>1</sup> On the Japanese period in Taiwan see Harry Lamley in Murray A. Rubinstein, ed. Taiwan, a new history (Armonk, New York: M. E. Sharpe, 1999).

moved across the Yalu River to defend a sister socialist regime. That army, the victor in the Chinese Civil War drove the surprised the American and British forces down deep into the south. It was then, with the US engaged in full blown combat on the Korean Peninsula with the PRC, that the Truman administration sent naval forces into the Taiwan Strait to protect the government of the ROC. The United States would continue to recognize and support the ROC for almost thirty more years.

Early in the 1951, a high profile and multifaceted American foreign aid initiative began on in this now small and weak Republic of China on Taiwan. That initiative would proved to be perhaps the most successful effort of its kind in American post-war history and it was that initiative and the high-level cooperation of US and ROC technocrats that was at its core that produced the Taiwanese miracle and the high-tech miracle that was an essential and dramatic element in that process of economic transformation.

Before we examine the stages of that economic transformation it is important to meet three sets of actors. The first set consists of American civilians who were members of the Agency for International Development Mission, the arm of the State Department. These men were sent to the island to plan and then implement the Truman led government's foreign aid programs. The second set of actors were American military officers who were to help rebuild the ROC's armed forces and who also set up listening stations and sites for the analysis of data gathered by ROC agents and their networks still on the mainland. CIA agents worked with these men who were able turn Taiwan into America's forward base for the gathering of intelligence about the now hostile PRC. The third set of actors was those Chinese technocrats, newly arrived on the island, who worked with the ROC leadership to reinvent Taiwan as the "Other China." In

the pages ahead we will focus on the civilians, American and Chinese, who helped create the “economic miracle.”

The Taiwan “Miracle” can be broken down in four overlapping periods or stages. These are as follows:

1. The Stage of Import Substitution
2. The Stage of Export-Driven Industrial Development
3. The Stage of the Development of Computer-centered High-tech Industries
4. The Stage of Economic Relations with and Transfer of Technology to Mainland China

In the sections of this chapter that follow I will discuss, somewhat briefly each of the first two of these stages, then examine the American presence on Taiwan, a presence that is an important aspect of the Export-driven stage and is also related to the decisions that helped bring about the third stage, and then look at that third and fourth stage.

## **I.2 The Stage of Import Substitution**

The Import Substitution Stage is the starting point for the Taiwan Miracle, and, as much research on development has shown us. It is also a first stage that many evolving Westernizing economies go through, as what may be seen as a necessary “rite of passage.” It begins in the early 1950s and ends in 1960, as the Export Driven Stage begins to take shape.

But let us return to industrial development: A first step the government’s leaders and planners felt they had to take was to rebuild what had been there before, under the Japanese colonialists, as a foundation for future economic expansion. They needed economic support to do so and thus the presence of American foreign aid officials and advisors, with vast sums of

direct foreign aid funds at their disposal, became almost essential for both the survival of the regime and for the redevelopment its economy. American officials in the halls of the grand buildings at Foggy Bottom, at the embassy in downtown Taipei (near the preserved West Gate of the old Qing government's headquarters, and from the heights of the western neighborhoods of Tianmu and Yangminshan looked at Taiwan as a potential model—an Asian test case, for its attempts to administer foreign aid funds and practical advice.<sup>2</sup>

Their American allies provided the capital they needed to tide them over these difficult first years but this gift came with strings attached: Americans would have to be brought into the

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<sup>2</sup> There is a wealth of literature one can tap into to study this first and the later stages of the Economic Miracle to tap. I have suggested two of these in my introduction, the collaborative Li-min Hseuh, Chen-kuo Hsu, Dwight K. Perkins study and the more recent Yongping Wu study

I will also make frequent reference to Sophia Wang's recently published English translation of her biography of K. T. Li. The Chinese version of this manuscript had of a book already been published on Taiwan and now it has been joined on the book by an able translation and expansion by its author. I have made use of the manuscript of that book, a manuscript I read for M. E. Sharpe of Armonk, New York.

A host of other books on Taiwan's economic evolution, books that were written and published during the decades under discussion, have proven invaluable. Such books are, as I see them, very close to the source and give the flavor of the periods that their authors examine. These works include K. S. Yum, Successful Economic Development of the Republic of China in Taiwan (New York: Vantage Press, 1968), and Yuan-li Wu, Becoming an Industrialized Nation (New York: Praeger, 1985).

K. T. Li, one the major architects of the process contributed to the literature as well. See his K. T. Li, The Experience of Dynamic Growth on Taiwan (Taipei: Mei Ya Press, 1976) A later volume, also by K. T. Li, but with introductory essays by Gustav Ranis and John C. Fei has proven very useful. See K. T. Li, , The Evolution of Policy Behind Taiwan's Development Success(New Haven: Yale University press, 1988).

The basic book on the American foreign aid program on Taiwan is Neil H. Jacoby, U.S. Aid to Taiwan: A Study of Foreign Aid, Self-Help and Development (New York: Frederick A. Praeger, 1966).

Conference papers such as Peter Chow, "From Dependency to Interdependency: Taiwan's Development Path toward a Newly Industrializing Country," and Chu-yuan Cheng, Taiwan's Economy Under Chiang Ching-Kuo Han. My own take on this subject of economic development can be found in Murray A. Rubinstein, "chapter...) in Murray A. Rubinstein, ed. , Taiwan, a new history (Armonk, N. Y.: M. E. Sharpe, 1999) .

newly rationalized system of economic planning. There was another problem with the Americans: they disliked the kind of direct ownership of industries and commercial enterprises and control that key ideologues within the KMT and the government espoused and put into practice. As we have noted, it was government officials and party officials that took over many of the Japanese enterprises once the Japanese had surrendered the island.

As the 1950s went on, the first three of the basic challenges were met. Fiscal policies, while notably draconian, were introduced that did stabilize the currency. Funds were found for the large military and the American sea and air umbrella provided the degree of security the regime felt it needed. And, with American help and with an American presence on a number of joint committees, a successful land reform program was launched.

Infrastructure, in terms of hard-on-the ground assets—roads, rail lines, port facilities, and the basic industries that allowed the transportation systems to be re-constructed, expanded, and maintained—had still to be fully developed for economic expansion and the creation of a powerful industrialized Taiwan to become possible. That process would take place in the 1970s.

The human infrastructure had to be re-developed as well. Thus the school system that had begun under the Japanese had to be expanded and improved upon. Primary schools, middle schools, high schools, colleges and universities had to be rebuilt and expanded to meet the growing needs of the now multi-regional Han (and Aborigine) populations and these schools, equipped and staffed well trained teachers. Modern curriculum—in Mandarin, the common language of the mainlanders and the Minnan and Hakka peoples who had settled the island before 1945, had to be developed. The planners such as K. T. Li, a graduate of Nanjing University who had done graduate work in physics at Cambridge realized all too well that an

educated workforce was required for development.<sup>3</sup> Medical care had to be improved as well as did the general level of public health and safety.

Certain aspects of the development of science and technology had been a priority of the Nationalist government during the Nanjing Decades and the war years and this interest continued once the government had reestablished itself on Taiwan (see Chapter 1). Americans became important here for the advice and deep expertise they could provide. We see this in the development of the nuclear energy program the government began and in the realm of high level technical education and in the education in the pure sciences.<sup>4</sup>

With the help of missionary doctors and teachers and secular teachers and experts working with US government agencies, training programs were developed that were designed to meet the needs of a better class of industrial workers.<sup>5</sup> Thus this development of the human infrastructure was thus stressed almost as much as the industrial/transportation infrastructure

However, the physical infrastructure presented more challenging problem. The Japanese system had been an extensive one and was being rebuilt, but the bureaucrats and planners and their American counterparts realized that more had to be done. The Japanese system that was in place provided but a starting point, even after it had been repaired and returned to full operation. As the Import Substitution Program took hold, the planners realized that there was already and

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<sup>3</sup> K.T Li has written about this facet of Taiwan's infrastructural development in his various books. See his See also Sophia Wang's new book, K. T. Li and the Taiwan Experience (Taipei: 2005). The citations in this essay are taken from the manuscript version of Sophia Wang's important book. I read the mss for M. E. Sharpe and strongly recommended that it be published by Sharpe. As fate would have it, it was not and thus is not a part of the M. E. Sharpe Taiwan in the Modern World Series.

<sup>4</sup> See J. Megan Greene, The Origins of the Developmental State in Taiwan: Science Policy and the Quest for Modernization (Cambridge, Mass.: Harvard University Press, 2008).

<sup>5</sup> On the missionary presence see Murray A. Rubinstein, The Protestant Community on Modern Taiwan: Mission, Seminary and Church (Armonk, N.Y.: M. E. Sharpe, 1991)

would continue to exist a need for new roads and inter-county highways, for new rail systems, for the improvement of the older harbors and port facilities and for the development of new ones.

Plans were drawn up and then expanded upon, but even contemplating such developed forced the planners to realize, as I have suggested above, that key industries had to be put in place to meet the needs of the types of basic materials---the steel, concrete and macadam, for example that the large scale construction projects would make use of. As each of the stages of the Taiwan's developmental miracle took, place both human and physical infrastructure was expanded to meet the change needs of the expanding economy. This was not accomplished piecemeal but within a coherent system that was build on a series of large-scale, multi year plans. Such plans and initiatives helped defined the nature of each of these progressive developmental stages.

During the 1950s, the Import Substitution Strategy was implemented by determined economic planners of the economy who running a strong and demanding state apparatus. A draconian, regulatory solution was put in place. To end the demand for goods, high tariffs were put in place and the people were forced to save money and limit their levels of consumption. The people of the island felt the pain of the scarcity that this policy did produce.

There were some novel and effective on-the -ground solutions that were put in place. Many of the basic needs of the populace such as education, health care, food, and clothing were provided by members of the Protestant and Catholic missions that moved to the island in the late 1940s and early 1950s and churches and denominations in the United States that supported this Christian missionary enterprise. Taiwan had become the center of what had been a large humanitarian and education effort that the missionaries had begun on the Chinese mainland. With coming of the anti-foreign and anti-religious CCP, however such mission bodies found

themselves driven for their old homes along the coast and in the Chinese interior. Taiwan became both refuge for Chinese Christians and the new base for the missionaries themselves and it was this area of relief that such missionaries made the largest contribution. But even such efforts were limited.

However, as the general economic conditions and the quality of life on the island slowly began to improve, there were increased demands on the part of the Taiwanese populace for basic consumer goods and more. The pent up demand for consumer goods was making itself felt. The easiest solution to this problem was to import such goods. However, to import such goods was to create a trade deficit and, by in doing so, further worsen a problem of a large-scale budget imbalance that the expenditures on the military system had brought about. But the demand was still there and here the strategy of Import Substitution, now in effect and now increasingly visible came into its own. Industries that produced products for the domestic market had to be put in place or expanded and the joint committees and ministries involved in this process began to move forward.

But more industries producing a wider range of products for domestic consumption and possibly export had to be started. The planners on the committees attempt to find such firms. And as they did so , they felt the pressure of meeting American demands for greater levels of privatization. Thus the board in charge of such matters began moving at what seems to have been a feverish pitch, finding individuals and group willing to take over given state industries and running them.<sup>6</sup>

They also pushed for start up companies as well. Willing investors were found especially after the land reforms had provided former landlords with newly available capital for such

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<sup>6</sup> Sophia Wang traces this process in her book, K. T. Li and the Taiwan Experience.

projects. As I suggested in my introduction, this act helped strengthen the hand of the Taiwanese Private Sector who were seen as a challenge by the more pure *sanmin zhuyi* ideologues, even as such moves were espoused by and carried out by the economic technocrats.

### **I.3 The Stage of Export-Driven Industrial Development**

The second of these stages, the Stage of Export-Driven Industrial Development is a vital one, in the minds of many observers of comparative economic development. By 1958, the Import Substitution Policy had made considerable progress and the privatization that the United States was pressing and that K.Y. Yin and K.T. Li had agreed to, was now underway, though on a scale still unacceptable to the AID advisors. However the budget deficit caused by military spending remained: The ROC's President and his inner circle of ideologues and departmental heads refused to let go their dream of the re-conquest of the PRC. They also felt that large defense established was needed to protect the regime against the threat of a PRC invasion. The United States officials now felt that new strategies had to be devised to deal with the budget issue and to also wean the ROC off the milk of fiscal survival that was American foreign aid dollars. New initiatives and strategies were called for to make the end of foreign aid possible. The multiple plans and initiatives designed to meet that goal of the end to foreign aid were summed up in the grand strategy that was the term "the Export –driven (or Oriented) Strategy.

The impetus for this change of direction came from the Americans. The United States had leverage over Taiwan and had the power over what the ROC could or could not accomplish economically and militarily. The great problem of the government deficit and the reasons for that deficit forced the United States to act in the late 1950s. When it did so it changed the course

of Taiwanese history. John Foster Dulles visited the ROC in the mid 1950s and the United States and the Republic of China signed a mutual defense treaty.

One heavy psychological and ideological cost of that treaty was the understanding that Chiang's regime would not continue to pursue its futile and provocative policy of attempting to recover the Chinese mainland. But the United States wanted more—it wanted Taiwan to reduce military expense or find a way to obtain the revenues needed to balance the budget. It also wanted the ROC to open its system up to private enterprise and reduce its strong –one might say strangling--hold on the Taiwanese economy. To push these agendas, the American officials then announced the formal end of foreign aid grants to the ROC. This step was taken to force the government to commit itself to strategy that would promote fiscal self-reliance, if not total economic separation.<sup>7</sup>

The director of AID on Taiwan met with high-level Taiwanese officials at the end of 1959 and strongly suggested an export-driven strategy as a general policy of dealing with the various economic issues. He then went still further. He and some Taiwanese planners saw the need for a wide-ranging set of changes that were designed to develop a strong foundation for the export driven economy that was to be developed. He suggested a number of proposals and these were used as the basis for what became know as the Nineteen Point Program. Generalissimo Chiang recognized that he had to give up his dream of a triumphant return to the mainland and his open of a ever flowing source of American financial aid and went along with the export driven strategy and the Nineteen Point Plan, thus setting in motion those steps that would result

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<sup>7</sup> See Hseuh, Hsu and Perkins., Industrialization and the State, 2. See also Lin Industrialization, 83-84.

in, within a decade, that period of expansive economic growth that would be term “the Taiwan Miracle.”<sup>8</sup>

From 1958 to 1963, the pieces of the bold grand strategy were mapped out and by 1964 the initial steps to achieve the success of the strategy had been taken. Each year thereafter elements of the grand plan implemented and sets of new, related initiatives were also put in place.

Before we move on to see how these strategies work it is useful to ask some questions about motivations and objectives. The first is this: Why did the planners feel the need to adopt this new direction in the economy? One reason was that the United States felt that the foreign aid they were providing had to be ended. Taiwan had shown that it was not been able to deal the problem of budget deficits as the U.S. advisors had warned them to do. They pressured the ROC to cut its military budget—the major source of those deficits but it was something the ideologues

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<sup>8</sup>The specific proposals that made up the Nineteen Point Plan may be broken down into a number of sections that covered related issues. The first such section dealt with overall economic development, The specific proposals dealt with plans to promote savings and develop capital markets as means of raising the overall rate of investment.

The second group of the points was designed to make the government have a better control over budgetary problems. Issues of tax regulations and of the program of subsidies were covered here. A third set of points deal with the banking system and here again issues of state control versus private control were focused upon, but with the decision made to have the state continue to have sway with its system of publicly held (i.e. governmentally held) banks holding the dominant position in the financial system.

The final set of points involved the sticky one of exchange rates and here progress was made toward moving to a single such exchange rate. What observers on the scene and what later groups of scholars have suggested is that the plan was not carved in stone and it contained points not yet fully fleshed out, but it did give the United States a feeling that their concerns were now being addressed. Furthermore, it provided a the basis for the more open economy that key figures within the ROC planning community could build upon and make use of in their own attempt to create a more viable and powerful private sector.

and Jiang himself was reluctant to do. To do so would be to admit that they no longer had the will to attempt to take back the Chinese mainland.

The United States did not want to pull out its aid or other types of support quickly. They could not abandon an old ally, one that had a considerable lobby in Washington that worked to insure and powerful US support for the continued existence of the ROC, but they wanted to show that could do something. They also wanted Taiwan to be able to wean itself off the aid and stand on its own as an economic force in East Asia.

What were the reasons the ROC went along with these suggestions? If the ROC leaders and planners adopted a strategy that would allow their vulnerable nation to become a more important economic and strategic entity for international production of the US and other advanced economies in addition to its role in the American security alliance in East Asia, this role would benefit the ROC politically at home and abroad.

Finally, were there other agenda's at play here? The answer is yes. For example, Taiwan would now also serve as an assembly area for many products produced by American manufacturers, thus fitting into the expanding world economy before one thought of the terms "globalization" or "technology transfer". By setting up such plants on Taiwanese soil American corporations such as the Long Island, New York-based electronics manufacturer, General Instrument would be able to cut labor costs and at the same time produce higher pre-tax profits, more of which the company could retain due to Taiwan's lower taxation. Taiwan also would gain because it would be the home of a new, vigorous, and cutting edge group of companies. These U.S.-based companies would gain higher revenues and the US government would be sure that an American company that might have failed on native soil could still produce respectable

levels of tax revenues. Furthermore, the U. S. government would also be cutting its expanding foreign aid budget during these years of Cold War competition with the Soviet Bloc.

There was to be a considerable lead time provided for this introduction of new industrial strategies and the ending of foreign aid. The U.S. advisors made sure that the ROC planners worked closely with them in a variety of ways to make the new system work and make the transition to partial self-sufficiency easier. One must add that not all aid was cut nor did many American government personnel leave Taiwan. There would remain the formal diplomatic presence, at least until the formal end of diplomatic relations in early 1979, and there would remain both the sizable Military Assistance Group (MAG) with its own specialized personnel, personnel who worked directly with the Taiwanese military and those other members of the American military establishment who ran the U. S. military facilities, such as air bases and less visible quasi-military and intelligence sites on-island.

But did the complex strategy, with its tax rebates, its investment incentives and its set of new EPZs work as planned? The record of the next twenty years shows that it did, in ways that far exceed its planners, particularly K.T. Li's expectations, but only after considerable hard work by both Chinese officials and their American counterparts.

When the formal program began, in 1964, only K. T. Li was left standing. His close friend and mentor K. Y. Yin had died in 1963 of what many observers believed was overworking. Li now became not only a key member of a number boards and committees, but was also a member of the cabinet. He and those around him tried to sell the idea to companies in the United States. General Instrument, a company we shall focus upon in Part 3 became the first American firm to buy in. Other electronics firms came in the years that followed and by the early 1970s the American consumer electronics industry was firmly transplanted on Taiwanese soil.

Other industries also came to Taiwan over the late 1960s and over the course of the 1970s such as the clothing industry and the shoe industry. Major American shirt companies such as Hathaway moved facilities to island, for example. Outer-ware manufacturers could also be found and thus, at the outlet stores in Taipei one could purchase seconds of the shirts and also goose down vest and goose down jackets at prices well below those in the United States. The recreational shoe industry was represented as these companies produced the running shoes and the high-end sneakers that became so popular in the 1970s. The name brands would be exported but brands with local names were readily available to the consumer at greatly reduced cost.<sup>9</sup>

This somewhat anecdotal evidence is reinforced by the aggregate data that is available. C. Y. Lin tracked this process in detail in his important book written in the early 1970s and shows us that from 1960 to 1970 the exports from the industrial sector US \$ 200,000,000 to US \$1,100,000,000. He then notes that this in turn produced greater growth in overall industrial growth and the efficiency of the industrial sector as well as higher levels of worker productivity. The most telling effect of all of this dynamic expansion was the fact that the net deficit on balance of payments ended and became a growing surplus by the mid-1970s and grew even greater in the decades that followed, in spite of world wide economic crises in oil begun by the Yom Kippur War of the fall of 1973 and other similar large scale diplomatic and military incidents and problems.

By the early 1970s, the ongoing and ever increasing pace of economic expansion began to strain the nation existing infrastructure and demonstrate the need to create new island-based

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<sup>9</sup> These comments are based on observations made while your author and his family were living in Taipei--- and playing the consumer ---in the late 1970s and when he was visiting each year over the course of the 1980s, 1990s and the first half of the first decade of the 21<sup>st</sup> century. See also Ying-yi Tu, "The Textile and Apparel Industries, Appendix A. in Hsueh, et. al., Industrialization and the State, 186-224.

heavy industries that could produce the materials needed for large-scale industrial expansion and infrastructural improvements. The Ten Great Projects were designed to deal with the weakness in the basic transportation system and the power grid and also deal with the question of the growing demand for semi-finished products and for oil and its byproducts. In his remaining decade and a half of life—the most productive time in his rather amazing and fruitful career, Chiang Ching-kuo, now the key figure in government and after 1978, the President of the ROC, oversaw the launching of this large scale and expansive program and the period when each of these projects reached completion.<sup>10</sup>

The Ten Major Projects focused on transportation. It included the development of new port facilities, new super-highways linking north to south, and a large scale and modern airport set in Taoyuan County an hour to the south and west of Taipei. The growing demand for electric power for industrial, commercial and consumer use was also addressed. Atomic-powered generators were planned and then constructed north of Taipei and in south on the large, scenic and still pristine bay that faced the Philippines.

Finally, the government involved itself in projects that suggested that the 1950s policy of import substitution had not yet died. A large-scale steel factory was planned and then built, with the help of a major German concern near Gaoxiong.<sup>11</sup> A shipyard was also built in the same area, the area that had long been the home of the local shipyards that had serviced East Asian fleets since the Japanese years. Nor was the demand for fossil fuel neglected. Large scale oil

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<sup>10</sup> Chiang Ching-kuo's long, eventful, and productive life are spelled out in Jay Taylor, The Generalissimo's Son: Chian Ching-kuo and the Revolutions in China and Taiwan (Cambridge, Mass.: Harvard University Press, 2000. On Ching-kuo's role in economic development see the masterful essay by Chu-yuan Cheng of Ball State University, "Taiwan's Economy Under Chiang Ching-ku" (unpublished mss.).

<sup>11</sup> See Hsueh, Hsu and Perkins, Industrialization and the State. See also Chu Yuan Cheng, "Taiwan's Economy under Chinag Ching-kuo," (mss.)

refineries were built both as a source of automotive and rail system fuel, but also as the basis for a textile and clothing industry based to a large extent on petroleum based threads and fabrics.<sup>12</sup> Each of these facilities were built and then put into operation with different degrees of success.

By the mid-1970s, it was clear that the shift to the export –driven strategy had been a solid success that produced record levels of growth in the Taiwanese industrial economy. The decision to focus on producing exports had been the correct one. The entire nation felt the impact of these large-scale economic changes. Taiwanese were enjoying their individual and collective success but were beginning to demand change in many of the ways their government and their nation was run. And though Taiwan was regarded as a Little Dragon, it was one, that after the Shanghai Communiqué and the de-recognition by the United States was increasingly isolated by the larger world.

What I have presented thus far is the large- scale context of the evolution of the high tech center that we are going to focus upon in this essay. Now let us shift to that smaller sphere of US technical cooperation and of the joint US/ROC effort to construct a new industrial economy with a consumer electronics segment at its cutting edge.

## **II. The American Consumer Electronics Industry in the Taiwanese Developmental Miracle: The Case of General Instrument Taiwan, Ltd. and its Long-term Taiwan based President James Klein**

When one looks deeper into to the nature of the crucial second stage of the miracle, the Export Driven stage one begins to see specific corporate actors and the individuals who ran them. Here let me first present out the nature of the American consumer electronic industry and

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<sup>12</sup> Yin-ti Yu, “The Petrochemical Industry,” Appendix B in Hsueh, Hsu and Perkins, Industrialization and the State, 224-265.

spell out how it came to and developed in the Taiwan of the decades from the 1960s to the 1990s.

What direction would the newly planned export-driven economy move in? What industries and types of Western firms would be involved in working with the Taiwanese authorities and potential Taiwanese suppliers (SMEs)? The answers to these fundamental questions would begin to appear in the early 1960s. It was during this period that a confluence of forces in America and in Japan produced the decision made by corporate leaders in each of these economic powers to shift elements of their developed or, in the case of Japan—still evolving—consumer electronics industries to a newly industrializing Taiwan open to these companies and to the assembly of their various product lines. This section focuses upon the American facet of this decision. Let us begin with the development of General Instrument.

General Instrument was a producer of electronic parts that evolved on the East Coast of the United States and that represented the what some of its employees and others have called the Jewish coast of the electronics industry. Firms located on the West Coast had their own distinct cultures, cultures my informants described as decidedly WASP in nature. GI evolved in this close knit, often interconnected yet very competitive industry and produced those specific components and parts, diode, rectifiers, transformers, switches and embryonic chips, that the major consumer electronics companies needed to assemble the radios, televisions and high end and specialized electronic equipment that the American military required to fight the Cold War.

Now let us again meet K. T. Li, one technocrats that planned and implemented the Taiwan miracle and, in the 1970s, one of the architects of the hi-tech section. Li and his mentor, K. Y. Yin, had developed the idea to bring American companies into Taiwan to act as exemplars and models for the development of the industrial sector and the consumer electronics industry.

By 1963-64 he was read to talk to such companies and the first he sought was General Instrument. Thus in 1964 he began too invite the leading executives of General Instrument to Taiwan and try to convince them to set up manufacturing plants on Taiwan. GI was the first company he talked to and the first company that accepted his offer. With GI's commitment in hand he knew he had taken the first of many steps to implement the export oriented strategy that he and his American counterparts had laid out in the early 1960s. Taiwan would now also serve as an assembly area for many products produced by American manufacturers, thus fitting into the expanding world economy before one thought of the terms "globalization" or "technology transfer."

Leading the way was General Instrument. How was GI able to establish itself and created the foundation for Taiwan becoming the new home of the American Consumer electronics Industry? One answer can be found by profiling the careers of the people that GI sent to Taiwan and then examining just what they did. One of the first of these was Richard Adler. A later and ultimately more important arrival was James R. Klein.

Richard Adler was an extraordinary and fascinating man and a throwback to an earlier age of American business as was the company he worked for. He was a person possessed of many different talents with a decidedly unique style that he projects to this day. He fit the GI executive profile as a bit of a brilliant, smart-ass rogue. Thus he was the perfect man to be able to succeed in fulfilling the challenges and problems that an American engineer/administrator faced on Taiwan. Within a few years after his arrival he was able to set up and operate an electronics component factory that produced high quality made-to-spec products in an area that had been a short time before a rice paddy suburb of Taipei—an area which today houses the

original GI factories and high rise, very exclusive apartment complexes in to what was then the still a largely undeveloped, mostly non-industrial, agricultural island nation.

General Instrument went into production by the late 1960s but it took an incredible amount of effort, know-how and sheer imagination to get the plants to that point. In interviews conducted in July of 2004, Richard Adler talked about this early period and provided details about just what had to be done and just how things were done. Suffice to say, according to Adler, the problems of construction of facilities and the problems of obtaining and installing the equipment needed to produce various components, antennas, cable converters and the many other products that these factories did eventually produce were many and had to be solved one at a time.

By the mid-1970s, according to Adler many of these problems had been dealt with but other problems of a different nature remained. These were problems of personnel and management and the man who was brought in to deal with these problems was James Klein. Thus the second man in GI we must study is James Klein.

Klein arrived on Taiwan in 1974 and took over, after some tense weeks as General Instrument's Vice-President for Personnel. He would succeed in this position and as the President of General Instrument Taiwan, Ltd. beyond his and his superior's greatest expectations. GIT's development under James Klein must be seen within the context of the larger linked processes of what is termed the second stage of the Taiwan economic miracle, the expansion and evolving sophistication of Taiwan's hi-tech industries development and the on-going development of the US-ROC-tech-transfer nexus. However it can also be seen for what it is—the case of the right man taking the right job for himself, his company and his adopted new home, Taiwan. Now we must look at the man and his work.

Klein's arrival in Taipei on the first day of 1974 was an inauspicious one that did not bode well for the future, but he did reach his hotel and then did get to the General Instrument headquarters in the Taipei suburb of Hsintian (Xindian) the next day. It was in this fashion that Klein's triumphal and highly successful career as corporate executive, as corporate president and intermediary between the American government and the Taiwan corporate community began. .

His first years on the island spanned the four years from 1974 to 1977. These were crucial ones for James Klein, for his company and its four divisions and for the community of transplanted American consumer electronic firms.

Over these first two or three years in-country, Klein had to face many problems and many challenges. He first found that he was forced to defend himself from the man whose position he was taking. The man refused to recognize him or accept the decision of the high company officers and went on with his normal routine, never trying to recognize the change or help Klein learn about what he had to do. This forced Klein to operate on his own and learn about the company and its culture in an informal way. He did gain the confidence of a number of the people of the same line rank and above and then found a way to ease the personnel man out. It was all in all a set of lessons well earned. Had he not had experience in a number of different corporations as an officer or as a free-lance consultant, he would not have been able to survive this difficult situation. It was an unwanted test, but he came through it looking good and all the better for the ordeal.

As Klein got to know the company on Taiwan, he became aware of the most difficult it faced—the very high worker turnover. The line workers were young women and they were housed a about a half mile away at facilities run by a Catholic priest. The walk from housing facilities to the factories was through paddy fields. Xindian is now a thoroughly urbanized

suburb that lies southeast of Taipei and is a few stops from the new Taipei Zoo that is the final stop on that subway line.

But what of the employee turnover problem GIT faced? Given the conditions these women lived in and worked in and the rigorous and disciplined life style that they were forced to lead, it seems little wonder that the turn-over rate would be around 12% per month and an astounding 144% per year. The time it took to train workers for what were very delicate tasks in potentially dangerous environments was high as were the overall stress levels. When one added the ugly factor of sexual harassment on the part of the male managers of these young female country girls, one can image the scale of the problem GI and similar companies faced.

Klein had two decades of experience figuring the solution to similar problems and he did some onsite research and conducted interview with managers and with the heads of each division. He developed detailed proposals and argued for the acceptance of his new approaches to the problem. He won over the man who was then president of GI Taiwan and other officers and the plan was implemented. It succeeded in a fashion that was far beyond anyone's expectations and James Klein became a "local hero."<sup>13</sup>

This was but a first step. Klein then began to reorganize the whole salary system and the incentive system for managers. It was the type of reorganization that did create enemies on local level but support from those above. He had also created a powerful network of friends and allies and by 1975 had become de-facto president of the GIT. That title was formalized by his actual promotion to President in 1977. But having the title "president" did not really mean having substantive power. The president, according to Klein, "operated as legal representative and

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<sup>13</sup> I have interviewed James Klein in depth and at length over the past three years. The data I made use of in this section comes from interviews conducted and taped at the Klein residence at Belfair Plantation in Bluffton, South Carolina in January of 2004.

when hired assumed that they had full power and responsibility.”<sup>14</sup> However, the reality at GIT was that the division managers thought otherwise. Even before he took over formally, Klein had begun to chip away at the managers’ belief that real power lay with them and what little power the on-site president could wield. He had worked in on number of problems on such areas of concern as personnel, training, labor relations and the increasing level of government involvement and at each stage, did what he could to strengthen the hand of the president. He also had a direct line to the GI Corporate president in NY. However, before he held the title and the “theoretical power of the position,” power that he wanted make real in the everyday world of GIT, he couldn’t do much. He still needed the status and the formal approval of command from corporate headquarters in New York City. Once authority was given to him he was able to make changes in the organization structure of GIT that, in turn, shifted power from onsite managers of GIT to the on-island to himself, president of GIT.

What Klein did, once he was formally president, was seemingly simple. He made each the division managers into “production managers.” Their task was to make things—products-based upon the production schedules for their respective U.S. heads of divisions. Everything else was reported to the president. This included “personnel/training, finance/accounting purchasing, security, administration, union relations, government relations, import/export, receiving and customs.”<sup>15</sup> This was an extensive amount of power and with the acquisition a state of the art IBM 360/40 computer, even more power was put into Klein’s hand for he had management information system tools to help him.

The control on the divisions was tightened even more as time went on with the president’s office providing basic services and also provided help in basic problem solving in the divisions.

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<sup>14</sup> Klein, ‘memoirs,’ (handwritten mss. (December 29, 2004.), 1.

<sup>15</sup> Klein, ‘memoirs,’ (handwritten mss. (December 29, 2004), 2.

Control of hiring and retaining personnel was one key item and here new structures were set up to bring many more Han-Taiwanese into the mix. Implementing this policy meant that many more local people were able to reach the ranks of middle management. Such middle managers were the core group in the reform and the democratization process that was taking shape on Taiwan.<sup>16</sup>

What these changes meant was that now the president now held real power. He also possessed an additional power, as well--to monitor the effectiveness of operations in each plant. The president could see what was going on and this meant fixes could be applied and problems could be solved without recourse to communicating directly to U. S. management in NYC.

These changes were implemented rapidly and they made GIT a much better company that by the 1980s was in Klein's words, "the Big Dog on the island, largest employer, top exporter, and a clear reputation."<sup>17</sup>

Klein would build off this success and he would over the years that followed expand his own role in GIT and strengthen GIT's presence in Taiwan and in other parts of East and South East Asia.<sup>18</sup> I simply mention this here but it is a tale told in greater detail elsewhere.<sup>19</sup> By the time the end of tenure as GIT's President came, in the early 1990s, he would have been able to use all his hard won skills to break up GIT into individual pieces. Each of these pieces, these GIT divisions would then be offered up for sale by the mother company's new owners, Foresman Inc and its very powerful and charismatic CIO, a man named Donald Rumsfeld. With his work

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<sup>16</sup> Klein, 'memoirs,' (handwritten mss. (December 29, 2004), 3.

<sup>17</sup> Klein, 'memoirs,' (handwritten mss. (December 29, 2004), 4.

<sup>18</sup> Klein, "summary of the 1980s" in "memoirs," (handwritten mss. (December 29, 2004), 21

<sup>19</sup> . I will have a chapter on Klein as GIT president in a biography of James Klein that is also a study of the American governmental and corporate presence on Taiwan from the 1950s through the 1990s.

accomplished he moved to the United States and to the home that he and his wife Helen had purchased at Sea Pines Plantation on the South Carolina golf Mecca of Hilton Head Island.

What the K.T. Li and Chiang Ching-kuo came to realize that they had allowed a tiger to enter the gates. They might have thought that with the end of foreign aid from the United States would come to the end of a forceful American presence on Taiwan,<sup>20</sup> but the Americans had their own agenda and had been able to carry it out with the help of such ROC friends as K.T. Li himself. The newly invited, and now invested American FDI firms, had their own ways of working and had their own networks and pressure groups in place by the end of the 1970s and thus had a major stake in the Taiwanese economy. But the ROC leadership also realized that they held the keys to a major new direction in the industrial economy---the development of computers and computer peripherals and the productions of computer chips.

Let us see just how they did this.

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<sup>20</sup> That presence could be seen on each street in the new sections of Taipei and the major cities and industrial and high tech zones to the south. By the early 1990s that icon of American fast food culture, McDonalds could be found on the major thoroughfares of the city. Many Taiwanese preferred American fast food to the classic street food or small local restaurant food that could be found a few streets or alleys distant. By the late 1990s Starbucks had invaded the central city as well and were a major competitor to the smaller, more intimate and more infamous and raunchy coffee shops that had dominated the city in previous decades. Thus American food and beverage culture, and American movie culture began to win the cultural war. American presence in general and the American Corporate Private Sector were now truly forces to be reckoned with.

These comments of the street scene and the growing American presence in that street scene are based on my two and a half decades in one major city area, of Taipei, the shopping and residential district west of the centers of the central government and bordering the Chiang Gong Memorial Park.

### **III. The Computer-centered High-tech Industry Stage of the Taiwan**

#### **Miracle**

The fifteen years from 1977 to 1992 saw Taiwan enter a new and more complex period in its economic, societal and political histories. The new sets of problems the technocrats and planners who had defined and implement the governmental policies that made the “miracle” possible now faced were different in scale and in nature from what they had dealt with in the export driven stage. They were, in a sense, trying to cope with their very success, even as that success forced government officials to move in directions they did not want to go, but had to in the new socio-economic environment of a Taiwan that they, as members of the Public Sector, had been able to create with the cooperation of the new and more aggressive and more dynamic Private Sector. Those who were statist and basically anti-capitalist in their thinking found that they themselves had played the role of Dr. Frankenstein and had unleashed the monster of a more open Private Sector economy. Thus they discovered that they faced quite different problems and had to develop strategies and on-the-ground tactics that allowed them to operate easily in this new and, in their eyes, chaotic environment of economic change.

The tone for the changes to come was set by the new leader, Chiang Ching-kuo. Ching-kuo was the son of the Generalissimo who had become Prime Minister in 1968 and president upon the death of his father in 1975. He had been the man who had been convinced that the infrastructure needed to be dramatically improved and had the power to push forward the Ten Major Projects to their successful conclusion. This was an important step, but he felt he needed to be more conversant in economic issues before he and his government could move ahead with the next stages of development. But there was something more here as well. Chiang had long deferred to his father’s judgment and to his father’s willingness to go along with K. Y. Yin and

his successor, K.T. Lin. Now that he had served as Prime Minister and was heir apparent to his father as President he wanted to have his own group of economic thinkers with him. The ideological and interpersonal dimensions to this struggle will be spelled out in the next section. Here I simply want to make mention of it as part of the background to the changes in large-scale economic developments that would take place in the year from the late 1970s to the early 1990s.

Chiang Ching-kuo was not alone in this thinking about what had to come next: By 1974 he had received a policy paper that showed him that some of the best Taiwanese economists connected with Taiwan were thinking ahead as well. Some of these men were members of the prestigious Institute of Economics at Academia Sinica. Others were based in the United States and were on the faculties of major universities. These men, citizens of the ROC who were in major positions in the west, were still willing to contribute the development of their home country. Liu Ta-chung (T.C. Liu) of Cornell, Fei Ching-han (John Fei) of Yale, Chiang shi-chieh (S. C. Tsiang) who held joint appointments at Rochester and Cornell, Ku Ying-chang (Anthony Koo) of Michigan State, Tsou Chih-huang (Gregory Chou) of Princeton and Hsing Mo-han of the Chinese University of Hong Kong. These men were all allied with the Milton Friedman-connected, free market (or “classical liberal”) Chicago School, rather than the more statist liberal(or New Dealer) Keynesian school. In report that they put together, “A discussion of Future Economic and Financial Policy in Taiwan,” they first commented on and praised the effort of Chiang Ching-Kuo and then made the case for their common economic thinking and the need to privatize Taiwan’s economy while continuing to make use of government intervention only in careful and more modest ways. This paper dealt with other issues as well and stirred a debate but some of the changes that they did advocate were adopted in this period. What they

had done was bring to Chiang Ching-Kuo's attention was a viable and authoritative case for the large-scale privatization of the Taiwanese economy.

What one can also say is that this report was one that could and did serve as foundation of the changes to be put in place a decade later, during a dramatic period of rapid political, diplomatic, and social change.<sup>21</sup> When more formal plans were developed in the mid 1980s, a number of these same experts were consulted once again and a number of these men were brought together again as the government formulated of new sets of initiatives to define the nature of the now even more sophisticated and complex economy.

The last years of the old decade the consumer electronics industry and the Information Technology (or computer) industry become the very center of the economic miracle. A bit earlier in the decade Industrial Technology Research Institute (ITRI) and the Electronic Research Service Organization under the ITRI umbrella were established in 1973. It was during this time that discussion about the manufacture of wafers (electronic chips) had been discussed and a tentative step was taken. RCA, one the American consumer electronics firms brought in the mid 60s signed a technology transfer agreement with ITRI and a private firm (but with the government holding 40% of the stock), United Microelectronics was set up. This firm became one of the pioneer in the area of chip manufacture and would produce a wide range chips for consumer products over the course of the 1980s. The second major firm in the field, a firm with a more ambitious agenda, Taiwan Semi-conductor was set up in 1986 with a Morris Chang, the former president of the American firm, General Instrument (and parent of the General Instrument Taiwan Ltd) took command of this new and, soon thereafter, major actor in the rapidly evolving technology sector.

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<sup>21</sup> See the discussion of this in Hseuh, Hsu, and Perkins, Industrialization and the State, 67-69.

But let us go back a bit. In the late 1970s, both Li and Premier Sun and key figures in industry did not think the time was yet right for moving aggressively. Organizational groundwork had to be done. K. T. Li, the grand master of the export promotion strategy and more, had lost his struggle with the president but a new and important place in government was found for him. Chiang Ching-kuo was a better judge of people than his father and a far more successful strongman turned governmental leader and he recognized the contributions Li had made and the depth of his knowledge in the field of science and technology. Thus Li, was given command of a fair amount of governmental policy planning in this increasing important private sub-sector. He was a smart man who read the situation correctly and took the opportunity granted to him by the man he had served but often disagreed with to set down the path for Taiwan's technological future.<sup>22</sup>

First was the issue of formally organizing the new effort. This began, with the convening of major conference, the First National Conference for Science and Technology Development began in 1978. It was promoted by Li and here he had the support of both Premier Sun, and the now-officially elected ROC President, Chiang Ching-kuo. The attendees, pushed by the conveners produced a basic document that Li then used as the basis of the program for development of pure science and technology. It had broad set of three large scale objectives, each with its own subset of goals. Furthermore an administrative organ within the government was created and it was the task of members of the newly formed National Science Council for putting these plans in effect. Within three years, the called-for large scale research plan had been drawn up.<sup>23</sup>

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<sup>22</sup> Hsueh, Hsu, and Perkins, Industrialization and the State, 60.

<sup>23</sup> Hsueh, Hsu, and Perkins, Industrialization and the State, 59.

The next step was to concretize the new IT initiative by creating a home for research and development and new modes of production. Here Premier Sun took command. He too had a science/technology background and saw the value of bringing together technical education resources with centers of corporate Rand D and with onsite production facilities. The result was the Xinzhu Science and Education Park. It was formally launched in 1979 and became a model facility of its kind and a display area for the industry that would evolved with such speed over the course of the 1980s and 1990s.<sup>24</sup>

Hsueh, Hsu and Perkins, in their important and grand introduction to (or perhaps the better word is “summing up” of ) the Taiwan miracle book, Industrialization and the State, suggest that the Sun and Li had another purpose in mind in establishing the Xinzhu facility: they saw it as away of convincing western train Taiwanese scientists that great opportunity awaited them not in the United States, but back home on Taiwan. BY the 1970s, with the growth of the consumer electronics industry many of these “overseas Taiwanese” began to come home but this new park made the new direction of Taiwan’s industrial sector as clear as could be. It was a beacon seen by Taiwanese engineers and scientists as far away as Poughkeepsie, the IBM stronghold in New York's not so bucolic Dutchess County.<sup>25</sup>

The strategy to make Taiwan a place for the professionals to return to did work out by the late 1980s. Salaries had risen, opportunities were abundant and native Chinese language ability was advantage, not a hindrance. Ownership and high level management positions were a good possibility for those ambitious and talented enough and there were many who were in that category. After 1988, there was one other strong reason the engineer or physicist or chemist to

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<sup>24</sup> Hsueh, Hsu, and Perkins, Industrialization and the State, 60-61.

<sup>25</sup> This comment is based on conversations with Taiwanese Chinese engineers and IT specialists made at Vassar College (actually on the Vassar Golf Course) in the summer of 2007.

return home: The Chinese mainland's economy was taking off and one direction that new economy was taking was in technology. From the late 19<sup>th</sup> century, if not the late Ming and High Qing that the Jesuits came to know and to contribute to, the Chinese had been fascinated by Western science and strove to master it as best they could. Even the laobaixing were fascinated, as the new scholarship on the quasi-cult surrounding the introduction of electricity shows us. It was also easy for those who wanted to learn more about public figures like Yin, K. T. Li, Premier Chen and Premier Sun, to discover just what types of backgrounds and skills these able and famous policy makers and leaders had had. The list of new and successful firms in IT such as Acer with its president Stan Shih make this point quite clear to all.

Development of the hi-tech sector was a key element in economic development but there was more planning going on, and scale that reached the entire economy itself. In the mid seventies major figures in the economic theory who were loyal to the ROC, though based in American universities, had been brought in to assess the Taiwanese economy. Those reports were now returned to by the men around CCK. He, he, himself was in poor health now and his Vice-president and his premier were now taking over many of his responsibilities.

Premier Sun had been involved at this level and now felt that the grand initiative begun in the 1970s had now to be continued. What amounts to a master plan on the macro –economic level was now called as a means of charting the course of a maturing economy that was on the verge of becoming what the United States had become, a service oriented economy that was able to invest in other areas and to place its manufacturing sector in places where costs of production were lower, but still of good quality (see Chapters 3 and 7 of this volume).

By the mid-1990s, the new economy that had been re-imagined in the 1980s had begun to take shape. But there was more. There was the new domestic and international political

openness of Taiwan. This new aspect—this totally new direction was a result of those political and fiscal and foreign policy initiatives that the dying CCK had launched in 1987. He had ended martial law, thus opening the political system and moving Taiwan from soft totalitarianism to quasi-democracy. At the same time he had opened the way for Taiwan and the Mainland to come together economically. He had ordered that those people of who had relatives in China could visit them. This seemed like a small step but many grasped its real significance—China was a place where one could visit and then, quietly assess the possibilities of trade and investment. Furthermore the limits on the amount of currency one could out were changed and this allowed for greater levels of cash flow. In the next few years quasi-public agencies for mainland relations were set up in Taipei and similar bodies were set up in Fuzhou, the capital of Fujian, the Chinese province that most Taiwanese had come from.<sup>26</sup> In my three research trips to Fujian, from 1990 to 1995, I saw evidence of the various levels of the evolving ROC/PRC relationship.<sup>27</sup> I saw the surge of what I termed pilgrimage tourism. I saw trade in religious items and I saw the reconnection of Taiwanese religious institutions with those in the mother province. Christians, Buddhists and members of major folk religious communities developed these new networks. I also that the Taiwanese investment in the evolving Chinese economy had become possible and that the trade and industrial officials on the national, the provincial ,and the county/city levels in China were now trying to woo Taiwanese investors to their home areas

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<sup>26</sup> On this political development see Murray Rubinstein, In Rubinstein, ed. *Taiwan: A New History*.

<sup>27</sup> Over the course of these years I was studying the phenomenon of pilgrimage tourism, but also trying capture a sense of the roots of the larger Taiwanese experience by examine those key areas along the Fujian coast where the Fujian immigrants to Taiwan who would become over time, Han-Taiwanese had come from.

in the same way that KT Li had wooed Americans to Taiwan in the 1960s. Taiwan's new renewed involvement with the mainland had begun.

We can see this renewed contact with the PRC as an outgrowth of the stage of hi-tech development or as yet another stage in the Taiwan miracle. I prefer to think of it as a continuation or extension of this third crucial stage, the stage in which the high tech industries came to the forefront of the Taiwanese economy and made Taiwan a world leader in an important global phenomenon, the expansion and transformation of the IT sector. What is new about this stage is the way Taiwanese manufacturers in this and other industries took full advantage of the Chiang Ching-kuo opening to the Mainland. In the first years of the 1990s, these companies attempted to get a feel for mainland and attempt to assess its potentials as both trading partner and site for major investment in money, equipment and personnel. Both of these activities increase dramatically after 1990. Movement of capital and expertise increased exponentially in the years that followed.<sup>28</sup>

Let us trace this development in a more systematic way. Formal regulations governing investment and trade were introduced in 1989. These sanctioned indirect trade, investment and technological cooperation. However as early as 1990, it was clear that events were moving faster than they realized, and thus a system of reporting investments and amount of business being done was put in place.

In this first phase of cross the Strait trade and investment the shifting of facilities that were labor intensive and low tech was made possible. This shift was made because the economic leaders on Taiwan realized that the PRC had a competitive edge here and the best way of regaining that advantage was to produce such goods themselves in cities of China's southeastern

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<sup>28</sup> . See the large scale Rand Corporation book on this development: Rand Corporation, *Shanghai'd* (2004).

provinces. New laws and regulations were thus promulgated as a way of getting a handle on what was going on. The PRC provincial and central authorities responded by developing new industrial zones that were designed for foreign—here read Taiwanese and Hua-chiao--investors near such cities as Fuzhou, Xiamen and coastal areas such as Meizhou Bay that were close by the small city of Putian. They also put into effect programs that would provide tax breaks and site preparation for these investors and ran yearly trade and investment fair to entice further investment.

President Li responded to this ever larger investment in the PRC's economy by promoting a Go-South investment policy that would, had it succeeded on a larger scale, have Taiwanese investors investing in plants, equipment and personnel training in the nations of Southeast Asia, including Vietnam. Direct air links from Taipei and Gaoxiong to such cities as Hanoi, Saigon, and Kuala Lumpur cemented this process even further.

The Taiwanese hi-tech sector, that had been bankrolled by the CCK administration had become became part of the larger China bound FDI mix during the 1990s as well years and major firms began to invest in the PRC with ever larger sums of money. By 1999 only about 50% of the PCs, peripherals and ICs produced by Taiwanese companies were actually manufactured on Taiwanese soil.<sup>29</sup>

The ROC economy suffered the effects of the dot-com crash of 2000 and growth slowed by almost half from almost 7% to about 4% and this had a direct effect on the investment in the PRC. A new administration also came to power. What was needed now was a more direct set of linkages to the mainland and the development of the three mini links became a matter of high

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<sup>29</sup> Shanghaied?, 7-8.

priority. We have now followed the process Taiwan's economic development and of ROC/PRC post 1989 economic relationship as it evolved until 2001.

## **Conclusion**

This chapter has taken us far and suggested the nature of the development of the Taiwanese economy since the Retrocession of the 1940s. We have seen the role of major political actors such as Chiang Kai-shek and his son Chiang Ching-kuo and of key high level technocrats, most notably K.T.Li. We have also seen the role of key American governmental agencies such as AID. What we have also seen, through the eyes of an American corporate expatriate executive in a pioneering US electronics firm is the role that this industry in the first larger scale stage of technology transfer-from the United States to Taiwan, that in turn played a role in the development of the Taiwan based high tech industry that evolved over the course of the 1970s and 1990s and continues to evolve over the course of the first decade of the new millennium. We are now ready to examine the next stage of the tech-transfer process and its role in the evolution of cross strait economic development. The chapters that follow focus on that complex process.