



Understanding Economic Development in Modern China: The Interplay among the State, the Market, and the Social Sector

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I explore the interplay of the state, the market, and the social sector in the growth of indigenous firms in the economic development process. From the 1960s to the early 1990s, scholars debated the roles of the state and the market in economic development. By the late 1990s, the social sector entered the debate more seriously. However, a tendency remains to argue that either the state, or the market, or the social sector is the key to economic development, rather than all three working in concert. Furthermore, scholars tend to focus on the macroeconomic output (for example, the Gross National Product) rather than on the microeconomic level (such as the growth of indigenous firms). I focus on the level of analysis of the firm and ask three research questions: what is the interplay of the three sectors in economic development? Under what conditions do the three sectors work together to grow firms? What is the division of labor among the three sectors?

The Beginning of Economic Development

Economic development is a young research area. In 1981, Albert Hirschman said it was “born about a generation ago.”¹ Heinz Arndt dated the discipline of economic development back only to the end of World War II. The term “economic development” to refer to a process that societies undergo was hardly used before World War II.²

After World War II, the number of newly independent countries multiplied. As historian Eric Hobsbawm recorded, “the number of internationally recognized independent states in Asia quintupled”; in Africa,

¹ Albert O. Hirschman, *Essays in Trespassing: Economics to Politics and Beyond* (New York, 1981), 372.

² Heinz W. Arndt, *Economic Development: The History of an Idea* (Chicago, 1987), 1.

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“where there had been one in 1939, there were now about fifty”; and in Latin America “another dozen” new countries suddenly appeared.³

Although they came from different historical, cultural, and political traditions, newly founded countries in Asia, Africa, and Latin America had one common economic feature: poverty. Worse, the gap in per capita GNP between them and the developed countries was widening. In 1970, the developed countries averaged 14.5 times the Gross National Product (GNP) of the Third World. In 1990, the factor rose to 24. Those newly founded poor countries were “grouped . . . as the Third World” in order to contrast with the First World.⁴

Alleviating the poverty in the Third World was the goal of economic development theory. As Hirschman stated, “Development economics started out as the spearhead of an effort that was to bring all-round emancipation from backwardness.”⁵

Taking Shape

After World War II, economic development theory took shape in the crossfire between the Left and the Right. The Marxists and Smithians formerly had academic battles over the First World, and now they found new arenas in the Third World. Though there is an old saying that all roads lead to Rome, scholars of economic development did not agree that all roads lead to wealth. Some insisted on the road on the right, others, the road on the left. As usual, the Right emphasized the magic of the market, whereas the Left emphasized the importance of the state. Over the past decades, sometimes the Right won the argument; at other times, it was the Left. The dominant theories of economic development from the 1960s to the early 1990s are listed in Table 1.

TABLE 1
Dominant Theories of Economic Development, 1960s–1990s

Years	The Left	The Right
1960s		Modernization theory
1970s	Dependency theory	
1980s		Market friendly approach
Early 1990s	Developmental state	

³ Eric J. Hobsbawm, *Age of Extremes: The Short Twentieth Century, 1914-1991* (London, 1995), 344.

⁴ *Ibid.*, 361, 344.

⁵ Hirschman, *Essays in Trespassing*, 387.

The 1960s: Modernization Theory

Walt Whitman Rostow, the most important scholar pioneering modernization theory, published his most famous book, *The Stages of Economic Growth*, in 1960. The message of the book's subtitle, *A Non-Communist Manifesto*, was clear: if poor countries intended to develop, they should adopt capitalism, not communism.

Rostow's main contribution was to propose five stages of economic development. He discussed many countries in this 167-page book: Britain, France, the United States, Germany, Sweden, Japan, Russia, Canada, Australia, Turkey, Argentina, Mexico, China, and India, covering a time frame from 1780 to 1959. After reviewing the histories of those countries, he maintained that it is possible to identify all societies, in their economic dimensions, as lying within one of five categories: the traditional society, the preconditions for take-off, take off, the drive to maturity, and the age of high mass consumption.⁶

Of the five stages, "take-off" is the most significant. Those past the stage of "take-off" are regarded as developed countries; those that have not reached that stage are viewed as developing and may not have an infrastructure that is able adequately to support an efficient national market. The market is key to economic development, and "we can, of course, track our ancestry to Adam Smith."⁷

In order to take off, a country would need foreign aid to build the infrastructure of a market economy. Foreign aid has been a critical factor in the take-off phase of many developing countries because it has helped to finance large capital-intensive infrastructure projects, such as the construction of railroads and highways.

Rostow continued to make a strong case for foreign aid: "external assistance must be organized on an enlarged and . . . more stable basis." Modernization should be "initiated by some intrusion from abroad."⁸ Instead of encouraging indigenous development, Rostow preferred "assistance from outside, the World Bank, direct foreign investment, multinationals and [even] military advisers."⁹

Overall, Rostow argued for a one-path-fits-all approach to economic development. To modernize was to move a country from a lower stage to a higher one; every country would follow the same path. As Rostow

⁶ Walt Whitman Rostow, *The Stages of Economic Growth, a Non-Communist Manifesto* (New York, 1960), 4.

⁷ Rostow, *Stages of Economic Growth*, 335.

⁸ *Ibid.*, 143, 62.

⁹ Ulrich Menzel, "Walt Whitman Rostow (1916-2003): A Non-Communist Manifesto," *D+C: Magazine for Development and Cooperation* 12 (Summer 2003): 466-70.

claimed: “Modernization in an interconnected world is a *single* case of modernization.”¹⁰

The 1970s: Dependency Theory

Enter Andre Gunder Frank. There was a paradigm shift in development theories “from Rostow to Gunder Frank,” according to Aidan Foster-Carter.¹¹ Andre Gunder Frank is “the archetypical Western radicalized intellectual.” He “at that time [1970s] dominated development thinking.”¹² Frank’s overall academic position is against modernization theory, against outward-looking development and against Rostow.

During his academic stay in Brazil, Frank found U.S. aid to be exploitive rather than helpful. In an article entitled “Aid or Exploitation in Brazil,” he found that in fact Brazil was exporting capital to the United States. He argued against Rostow’s argument that the Third World needed foreign investment and capital from the First World.¹³

Latin American scholar Theotonio Dos Santos’ research confirmed Frank’s argument. According to Dos Santos’ calculation, in the period from 1946 to 1968, there was an outflow of \$15 billion from Latin America to the United States in the form of dividends, interests, etc. On the other hand, the capital flow from the United States to Latin America was just \$5.5 billion.¹⁴

In 1967, Frank developed his arguments into a full-fledged theory. Based on the histories of Chile and Brazil since the eighteenth century, Frank argued that we should regard “development and underdevelopment . . . [as] the product of [the] single . . . economic structure and process of capitalism.”¹⁵ In this single process of capitalism, the developing countries would first undergo a forced “incorporation into and subsequent participation in the worldwide expansion of . . . [the] capitalist system.”¹⁶ After the completion of incorporation would come polarization of the global capitalist system into “the metropolis-satellite structure.”¹⁷

¹⁰ Walt Whitman Rostow, *Politics and the Stages of Growth* (New York, 1971), 63 (emphasis added).

¹¹ Aidan Foster-Carter, “From Rostow to Gunder Frank: Conflicting Paradigms in the Analysis of Underdevelopment,” *World Development* 4 (1976): 167-80.

¹² J. F. J. Toye, *Dilemmas of Development: Reflections on the Counter-Revolution in Development Theory and Policy* (Oxford, U.K., 1987), 104.

¹³ Andre Gunder Frank, “On the Mechanisms of Imperialism: The Case of Brazil,” in *Readings in U.S. Imperialism*, ed. K. T. Fann and D. C. Hodges (Boston, Mass., 1971): 237-56.

¹⁴ From Ernest Mandel, *Late Capitalism*, (London, 1975), 66.

¹⁵ Andre Gunder Frank, *Capitalism and Underdevelopment in Latin America: Historical Studies of Chile and Brazil* (New York, 1967), 9.

¹⁶ Andre Gunder Frank, *On Capitalist Underdevelopment* (New York, 1975), 21.

¹⁷ Gunder Frank, *Capitalism and Underdevelopment in Latin America*, xi.

In such a polarized structure, the relation between the metropolis and satellite is an exploitive one. On one hand, the metropolis is dominative. It “expropriates economic surplus from its satellites” and “appropriates it for its own economic development.” On the other hand, the satellite is submissive. It is “dependent on the metropolis . . . for the supply of its capital goods and other components of its industrial production.”¹⁸

As a result, “the satellites remain underdeveloped for lack of access to their own surplus.” Frank’s conclusion was that “the historical development of the capitalist system has generated underdevelopment in the peripheral satellites.” Thus, according to Frank, “economic development and underdevelopment are the opposite faces of the same coin.”¹⁹ It is not the case that underdevelopment is a previous stage of development, as argued by Rostow.

A corollary of the above analysis is that “weaker . . . metropolis-satellite relations may generate less deep structural underdevelopment” and “allow for more possibility” for the satellite.²⁰ Therefore, the government should step in to establish high tariffs, adopt import substitution policies, and reject foreign aid. The developing countries need to build self-reliance in order to terminate exploitive and dependent relations. This was contrary to what Rostow had suggested: that foreign aid helps local development.

The 1980s: A Market-Friendly Approach

The most important research on the rise of East Asia is the World Bank’s *The East Asian Miracle*, published in 1993. Japan provided “a budget of \$1.2 million”; the task of the World Bank was to review how seven Highly Performing East Asian Economies (HPAE) developed their economies.²¹ The HPAEs include the four tigers (Hong Kong, South Korea, Singapore, and Taiwan) and three newly industrializing economies (Indonesia, Malaysia, and Thailand).

The World Bank endorsed outward-looking economic growth in the East Asian countries: “East Asia’s sectoral policies were usually geared toward export performance, in contrast to the inward-oriented policies of less successful developing countries.”²² What is responsible for East Asia’s success? The World Bank’s answer: “by getting the basics right,” by getting the basics of the market mechanism right.²³ It is preferable for the state to get out of the economy because the market is the magic bullet.

¹⁸ Ibid., 9, 105.

¹⁹ Ibid., 9, 3, 9.

²⁰ Ibid., 11.

²¹ Robert Wade, “Japan, the World Bank, and the Art of Paradigm Maintenance: The East Asian Miracle in Political Perspective,” *New Left Review* 217 (May-June 1996): 3-36, quotation at p. 18.

²² World Bank, *The East Asian Miracle: Economic Growth and Public Policy* (New York, 1993), 23.

²³ Ibid., 5.

According to the World Bank, the limited role of the government in the economy would allow countries to “get the fundamentals right.” The World Bank drew two conclusions about state interventions. First, “industrial policy . . . was generally not successful.” Second, even though some industrial policy might have been successful, “East Asian success sometimes occurred *in spite of* rather than *because of* market interventions” by the state.²⁴

Arguably, the World Bank’s market-friendly approach was in the spirit of the third duty of the state prescribed Adam Smith. “The sovereign has only three duties to attend to,” said Adam Smith more than two centuries ago in his *The Wealth of Nations*: first, “the duty of protecting the society from the violence and invasion of other independent societies”; second, “the duty of protecting every member of the society from . . . injustice”; and third, “the duty of erecting and maintaining certain public works and certain public institutions which can never be for the interest of any individual.”²⁵

The 1990s: Developmental State Theory

Of course, scholars on the Left did not agree with the World Bank’s prescription for economic development. If the market could allocate resources efficiently to grow the economy, so could the state. Moreover, if the Right could use East Asia to make a case for the market, the Left could use East Asia to make a case for the state.

Japan’s Developmental State. Chalmers Johnson is one scholar who pioneered the role of the state in economic development. After reviewing the history of Japan from 1925 to 1975, he argued that Japan represented a revisionist version of Western orthodox economic theory.

Japan’s political economy differs from that of Anglo-American countries in institutions, the role of the state, and the weight of economic nationalism.²⁶ The role of the Japanese state was a developmental one, not a “capitalist regulatory state,” such as the United States. As a regulatory state, it took on “regulatory functions of maintaining competition, and consumer protection.” In contrast, a developmental state, by definition, took on “developmental functions”; its “first priority” was “economic development.”²⁷

Moreover, there was a strong flavor of nationalism in the Japanese developmental state. The primary goal of Japanese economic development was “to achieve independence from and leverage over potential

²⁴ Ibid., 10, 88, 354, 86 (emphasis in original).

²⁵ From Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York, 1973), 302.

²⁶ Chalmers A. Johnson, *Japan, Who Governs? The Rise of the Developmental State* (New York, 1995), 12.

²⁷ Chalmers A. Johnson, *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975* (Stanford, Calif., 1982), 19, 305.

adversaries.” It was not “to achieve consumer utility, private wealth, mutually beneficial trade” as assumed by Western economists.²⁸ The notion of such a developmental state, Johnson noted, “always seems to raise difficulties in the Anglo-American countries.”²⁹

The Ministry of International Trade and Industry (MITI) was the most important institution in the Japanese economy. Johnson referred to the way MITI manipulated and structured the market as “market-conforming methods of state intervention.” It conformed to the market mechanism because it “preserve[d] competition to as high a degree as [was] compatible with its priorities.”³⁰

South Korea: A Market-Augmenting Paradigm. In 1989, Alice Amsden published *Asia's Next Giant* to describe how South Korea approached economic development. She proposed a market-augmenting paradigm in contrast to Johnson's market conforming one. Based on South Korea's economic experience, she argued that “the relationships between the state and business were not cooperative, but disciplinary. The goal of the state intervention was not to comply with the market, but to distort it and to get the price wrong.”³¹

When the state disciplined firms, there existed “a reciprocal relationship.” First, the state provided firms with subsidies, financial incentives for firms to diversify into new industries. As Amsden observed, “every major shift in industrial diversification . . . was instigated by the state.”³² After providing subsidies, the South Korean government set objective and transparent performance criteria for firms. The state pressured “virtually all large size firms . . . to [meet] export targets” and was able to do so because it “owned and controlled all commercial banks.”³³

When firms performed poorly, the state would hold an attitude of “cold-bloodedness,” refusing “to bail out relatively large scale, badly managed, bankrupt firms . . . no matter how politically well connected.” By contrast, other developing countries failed to discipline business, and, as a result, in countries like India and Turkey “subsidies [were] dispensed primarily as giveaways.”³⁴

The goal of state intervention was to get the market price wrong. By the wrong price, Amsden meant “relative prices that deviated sharply from free-market equilibria.” By using subsidies, the state, rather than the market, “decide[d] what, when, and how much to produce.” The over-

²⁸ Johnson, *Japan, Who Governs?* 105.

²⁹ Johnson, *MITI and the Japanese Miracle*, 17.

³⁰ *Ibid.*, 315, 318.

³¹ Alice H. Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (New York, 1989), 139.

³² *Ibid.*, 146, 80.

³³ *Ibid.*, 16.

³⁴ *Ibid.*, 15, 15-16, vi.

arching goal of subsidies was “to create profitable investment opportunities.”³⁵

Taiwan: Governing the Market. Another important work on the developmental state is Robert Wade’s *Governing the Market*. Based on the history of Taiwan’s economic development from the 1930s to the 1980s, Wade proposed the theory of the governed market. He argued against research that “portrays [Taiwan] as the result of nearly free markets.” He said: “GM [governed market] facts are too important to ignore in an explanation of Taiwan’s . . . superior performance.”³⁶

By governing the market, Wade meant that “the government led rather than ‘followed’ the preference of private market agents.” He emphasized “dirigisme as a factor.” In other words, economic development in Taiwan was a top-down process “in line with government preferences.” In Wade’s words: “The government [took] initiatives about what product or technologies should be encouraged and put public resources or public influence behind these initiatives.”³⁷

The precondition for governing the market was to engage in it. As Wade observed: “The state was the contrapuntal partner to the market system, helping to insure that resources went into industries important for future growth.”³⁸ Thus, the way the Taiwanese state developed its economy was slightly different from that of its counterparts in Japan and South Korea, which both supported business without engagement in the economy. According to Johnson, the Japanese state supported business in cooperative ways. In addition, according to Amsden, the South Korean state supported business with discipline.

Another Look at South Korea: Embedded Autonomy. In 1995, Peter Evans, a University of California at Berkeley sociology professor, published *Embedded Autonomy* to answer a question never answered in previous works: What is a healthy relationship between the state and the market? Johnson, Amsden, and Wade answered only the question of how the developmental state interacts with business: the state supported businesses by cooperating, disciplining, or leading the way.

Evans proposed the notion of embedded autonomy to depict a healthy relationship between the state and the economy. To begin with, the state must have autonomy. An autonomous state has two distinctive features: first, “prowess and perspicacity of technocrats within the state apparatus”;

³⁵ Ibid., 145, 143, 14.

³⁶ Robert Wade, *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization* (Princeton, N.J., 1990), 6, 345.

³⁷ Ibid., 303, 112, 194, 28.

³⁸ Ibid., 110.

second, “an institutional structure that is durable and effective.”³⁹ However, autonomy is not enough.

To avoid insulation from society, an autonomous state needs to develop relationships with society. At this point, Evans introduced the other key notion: embeddedness. He argued that an autonomous state should be “embedded in a concrete set of social ties.” Thereby the state would have “institutionalised channels for the continual negotiation and renegotiation of policies.”⁴⁰

The Dynamics of the Progression of Economic Development Theory up to the Early 1990s

Marx, Smith, and Newton. Though the Left and the Right argued that the dynamics of the economy follow the principles of Karl Marx and Adam Smith, respectively, the dynamic interaction between the Marxists and the Smithians up to the early 1990s in fact is analogous to Newton’s Laws of Motion. Newton’s First Law of Motion in physics states that an object at rest tends to stay at rest, and an object in motion tends to stay in motion. Following this, I propose: In the field of economic development, scholars of the Left tend to stay on the Left; scholars of the Right tend to stay on the Right. Arguably, over the decades, no scholars have switched positions regarding the roles of the state and the market.

Newton’s Second Law of Motion states that the rate of change of momentum is proportional to the imposed force. Following this, I propose: In the field of economic development, the force provided by the selected interpretations of successful industrializing countries enhances momentum of the arguments of the Left and the Right. As we have seen in our literature review:

- In the 1960s, the successful experiences of the developed countries provided momentum to modernization theory.
- In the 1970s, the successful experiences of Latin American countries provided momentum to dependency theory.
- By the end of the 1980s, the successful experiences of East Asia provided momentum to the market friendly approach.
- In the early 1990s, interestingly, the successful experiences of East Asia also provided momentum to developmental state theory.

Newton’s Third Law of Motion states that for every action there is an equal and opposite reaction. Following this, I propose: In the field of economic development, for every argument either from the Left or from the Right, there is an equal counterargument from the Right or the Left. If the market could allocate resources efficiently to grow the economy, so

³⁹ Peter B. Evans, *Embedded Autonomy: States and Industrial Transformation* (Princeton, N.J., 1995), 141.

⁴⁰ *Ibid.*, 12.

could the developmental state. If the market could fail, so could the government.

What Does the Future Hold for Economic Development Theory? The Pessimistic Left and the Optimistic Right

It is illuminating to read the crossfire between the Smithians and the Marxists. The Left seemed a bit pessimistic about its future, while, in stark contrast, the Right seemed very optimistic and was about to dominate the debate.

The Left first lamented that it had reached an impasse in its theoretical development.⁴¹ After the impasse, there was a decline coming, and the decline was inevitable. As Hirschman said: “The decline of development economics cannot be fully reversed.”⁴² Finally, after decline there was death. Seers talked about the death of development economics: “[Marxist-influenced] development economics in the conventional sense has therefore proved much less useful than was expected in the vigorous optimism of its youth.”⁴³

The Right, however, was quite optimistic. On the one hand, it cannot wait to write obituaries for the Left:

“Development economics will then have ceased to exist.”⁴⁴

“Demise of development economics is likely to be conducive to the health of both the economics and the economies of developing countries.”⁴⁵

On the other hand, it cannot wait to blow its own trumpet:

“Countries are increasingly recognizing that what is derisively called the Anglo Saxon model of capitalism is the only viable one in the long run.”⁴⁶

“Free market . . . [has] spread, and [has] succeeded in producing unprecedented levels of material prosperity, both in industrially developed countries and in countries that had been . . . part of the impoverished Third World.”⁴⁷

Perhaps scholars should be neither too pessimistic nor too optimistic. Being too pessimistic would probably lead to academic impotence, and

⁴¹ David Booth, “Marxism and Development Sociology: Interpreting the Impasse,” *World Development* 13 (May 1985): 761-87, 761.

⁴² Hirschman, *Essays in Trespassing*, 387.

⁴³ Dudley Seers, “The Birth, Life and Death of Development Economics,” *Development and Change* 10 (July 1979): 701-19, 712.

⁴⁴ Ian Malcolm and David Little, *Economic Development: Theory, Policy, and International Relations* (New York, 1982), 16.

⁴⁵ Deepak Lal, *The Poverty of “Development Economics”* (Cambridge, Mass., 2000), 109.

⁴⁶ *Ibid.*, xiii.

⁴⁷ Francis Fukuyama, *The End of History and the Last Man* (New York, 1992), xiii.

being too optimistic would probably lead to academic arrogance. Neither will lead to a healthy development of economic development theory.

The Late 1990s: Enter the Social Sector

Ordinary readers of the literature of economic development might not feel comfortable with the debate between the pessimistic Left and the optimistic Right. How is it possible that the state and the market divide our society with nothing in between? As Henry Mintzberg and colleagues said:

Capitalism versus Socialism, markets versus controls, individualism versus collectivism, privatization versus nationalization. . . . There are no cooperatives, no NGOs, no “not-for-profits”, no “volunteer” organizations, not because they don’t exist . . . but because they have been forced aside by this simplistic divide.⁴⁸

Lester M. Salamon echoed this lament: “Ideological blinders have . . . obscured a clear assessment of the nonprofit sector’s true scope and role. For much of the past 50 years, politicians on both the political right and left have tended to downplay these institutions.”⁴⁹

If we live in a society of organizations, how is it possible that the organizations in the social sector play no role in economic development? Indeed, as Paul Streeten said, “states and markets do not exhaust the players in this game” of economic development.⁵⁰ Fortunately, as Norman Uphoff observed: “There is growing recognition of what is being called ‘the third sector,’ operating between what we refer to as the public and the private sectors.”⁵¹ According to Ernesto D. Garilao, the growing recognition of the social sector results from “The realization that neither government nor the private sector had the will, wherewithal or capacity to deal with immediate and lingering social problems.”⁵²

Thus, we can regard the social-sector organizations (SSOs) as “promoters of alternative development strategies.” They are “facilitators or catalysts of local development efforts.”⁵³ According to Joan Roelofs, the

⁴⁸ Henry Mintzberg et al., “The Invisible World of Association,” *Leader to Leader* 36 (Spring 2004): 37-45, 37.

⁴⁹ Lester M. Salamon, “The Rise of the Nonprofit Sector,” *Foreign Affairs* 73 (July-Aug. 1994): 109-22, quotation at p. 110.

⁵⁰ Paul Streeten, “Markets and States: Against Minimalism,” *World Development* 21 (Aug. 1993): 1281-98, 1286.

⁵¹ Norman Uphoff, “Grassroots Organizations and NGOs in Rural Development: Opportunities with Diminishing States and Expanding Markets,” *World Development* 21 (April 1993): 607-22, 609.

⁵² Ernesto D. Garilao, “Indigenous NGOs as Strategic Institutions: Managing the Relationship with Government and Resource Agencies,” *World Development* 15 (Autumn 1987): 113-20, 114.

⁵³ Anne Gordon Drabek, “Development Alternatives: The Challenge for NGOs—an Overview of the Issues,” *World Development* 15 (Autumn 1987): ix-xv, x.

social sector includes: churches, private schools and universities, cultural institutions, advocacy groups, political movements, charities, and foundations.⁵⁴ Consider, for example, two types of SSOs: associations and public research institutes.

Business Associations. According to the research of Richard F. Doner and Ben Ross Schneider, in many developing countries associations undertake a variety of tasks that complement the market.⁵⁵ These tasks include: macroeconomic stabilization and reform, horizontal coordination (quota allocation, capacity reduction), vertical coordination (upstream-downstream), lowering the cost of information, setting standards, and quality upgrading. Doner and Schneider also found that associations with the following features could complement the market much more effectively: high member density, valuable selective benefits to members, and effective internal mediation of member interests.

Annalee Saxenian and Jinn-Yuh Hsu also argued that associations could complement the market by transferring hard to codify technological knowledge from firm to firm. Tacit technological knowledge is hard to transfer through the market and can be transferred only “through informal communications or the interfirm movement of individuals.”⁵⁶

Saxenian and Hsu found that Silicon Valley in California and the Hsinchu-Taipei region in Taiwan were linked by associations, which served as “intermediates linking the decentralized infrastructure of the two regions.” They “transfer[red] capital, skill and know-how to Taiwan” and facilitated “collaborations between specialist producers in the two regions.”⁵⁷

Associations also complement the functions of the state, according to John M. Cohen, Mary Hébert, David B. Lewis, and Jon C. Swanson’s research on local development associations in the former Yemen Arab Republic. Local development associations were “independent community associations” and not “official state entities.” Recognized by the government, they received “support by the Ministry of Social Affairs, Labour and Youth.”⁵⁸ In the early 1980s, there were nearly two hundred local development associations serving Yemen’s six million citizens.

⁵⁴ Joan Roelofs, “The Third Sector as a Protective Layer for Capitalism,” *Monthly Review* 47 (Sept, 1995): 16-25.

⁵⁵ Richard F. Doner and Ben Ross Schneider, “Business Associations and Economic Development: Why Some Associations Contribute More Than Others,” *Business and Politics* 2 (Nov. 2000): 261-88.

⁵⁶ Annalee Saxenian and Jinn-Yuh Hsu, “The Silicon Valley–Hsinchu Connection: Technical Communities and Industrial Upgrading,” *Industrial and Corporate Change* 10 (Dec. 2001): 893-920, quotation at p. 901.

⁵⁷ *Ibid.*, 898, 893.

⁵⁸ John M. Cohen et al., “Development from Below: Local Development Associations in the Yemen Arab Republic,” *World Development* 9 (Nov.-Dec. 1981): 1039-61, 1043-44.

Local development associations emerged because of the dysfunctional Yemeni government. The state was paralyzed by its “political isolation and administration problems,” especially after the civil war. Furthermore, its authority was “seriously limited by strong local tradition.” As a result, the local development associations in Yemen were “active in undertaking tasks the central government is not organized to perform . . .they build roads, schools, village water systems, and clinics.”⁵⁹

Public Research Institutes. According to Diana Crane, public research institutes have been crucial to innovation in developing countries for three reasons.⁶⁰ First, small and medium-sized enterprises in the private sector of developing countries could not afford research and development. As a result, “industries in the developing countries typically [did] not have departments that perform[ed] industrial research.” Second, research at universities was too academic to apply to industry, and the interests of professors tended to favor “the interests of the international scientific community,” rather than the interests of the national economy. Third, government laboratories lacked ties to industry. As a result, the relationships between the government and business were either “absent or unsatisfactory.”⁶¹ The Chinese Academy of Science (CAS) in China and the Industrial Technology Research Institute (ITRI) in Taiwan exemplify the developmental roles of public research institutes.

The Chinese Academy of Science was crucial to the innovation that took place in China’s information technology industry after economic reform. Its contribution lay in transferring its previously accumulated technology into the industry by way of spin-offs. The CAS was created as a government unit under the control of the State Council in 1949. Yet, in 1954 China’s State Council no longer regarded the Chinese Academy of Science as a government unit and transformed it into an independent entity.

Since its founding, the CAS closely followed the model of the Soviet Union’s system of innovation. On the one hand, it began to separate its research from state-owned industrial enterprises, which themselves did little research and development.⁶² On the other hand, CAS’s research was

⁵⁹ Ibid., 1041, 1039.

⁶⁰ The literature on national innovation systems, such as Richard R. Nelson’s *National Innovation Systems: A Comparative Analysis* (New York, 1993), addresses the role of public research institutes in depth. However, I did not draw much from that literature because, as Amsden said in *Asia’s Next Giant*, developing countries’ “industrialization has come about as a process of *learning* rather than of generation of *inventions* or *innovations*” (4, italics added).

⁶¹ Diana Crane, “Technological Innovation in Developing Countries: A Review of the Literature,” *Research Policy* 6 (Oct. 1977): 374-95, quotations at pp. 376, 374, and 374.

⁶² Xielin Liu and Steven White, “Comparing Innovation Systems: A Framework and Application to China’s Transitional Context,” *Research Policy* 30 (Aug. 2001): 1091-1114.

mostly defense-related and had little impact on the economy. It contributed significantly to China's development of atomic bombs in 1964, as well as hydrogen bombs and satellites in 1967.

After economic reform, CAS began the overhaul of its innovation system in the early 1980s. It introduced the program of "One Academy, Two Systems" in 1986. The first system was to keep "a small number of its research personnel in basic research." The second system was to encourage most researchers "to seek outside support for applied research that directly benefits the economy and that meets market needs."⁶³

It was in the second system that CAS undertook "the commercialization of technological achievement" to fill the financial gaps.⁶⁴ Spinning off was the dominant way to commercialize its research. CAS encouraged its researchers to start up new ventures, and CAS would back start-ups by transferring technology. By 1997, CAS's 123 institutes had created nine hundred spin-offs.

The Industrial Technology Research Institute was CAS's counterpart in Taiwan. The Ministry of Economic Affairs created ITRI in 1973 in response to the energy crisis.⁶⁵ In creating the ITRI, the Ministry of Economic Affairs insisted that it be a nongovernmental organization so that it would be free of certain laws and regulations. By being unaffiliated with the government, it could lure overseas Chinese engineers back home by offering salaries that were two or three times larger than those of civil servants.

In 1976, ITRI helped Taiwan enter the semiconductor industry by transferring technology from RCA in the United States.⁶⁶ In 1982, ITRI helped Taiwan enter the personal computer industry by transferring computer technology from Wang Computer in the United States.⁶⁷

John Mathews summed up ITRI's contribution to Taiwan's information technology industry as follows: ITRI "import[ed] the technology . . . absorb[ed] it and adapt[ed] it, involve[d] Taiwanese firms in projects that

⁶³ Cong Cao, "Zhongguancun: China's Silicon Valley," *The China Business Review* 28 (May-June 2001): 38-41, quotation at p. 38.

⁶⁴ CCCPC, "Decision on Reform of Science and Technology Management System (in Chinese)," 1985.

⁶⁵ Limin Xue, Chen-kuo Hsu, and Dwight Perkins, *Industrialization and the State: The Changing Role of the Taiwan Government in the Economy, 1945-1998* (Cambridge, Mass., 2001).

⁶⁶ Cheng-Fen Chen and Graham Sewell, "Strategies for Technological Development in South Korea and Taiwan: The Case of Semiconductors," *Research Policy* 25 (Aug. 1996): 759-83.

⁶⁷ Pao-Long Chang, Chiung-Wen Hsu, and Chien-Tzu Tsai, "A Stage Approach for Industrial Technology Development and Implementation—The Case of Taiwan's Computer Industry," *Technovation* 19 (Feb. 1999): 233-41.

utilize[d] the new technology, and finally . . . transfer[ed] it across products, equipment, and know-how to Taiwanese firms.”⁶⁸

The social sector seems to have come of age. There was a palpable associational revolution at the global level. As Salamon observed: “A striking upsurge is under way around the globe in organized voluntary activity and the creation of private, nonprofit or nongovernmental organizations.”⁶⁹ During the period from 1980 to 1993, the number of development-oriented SSOs registered in the developed countries grew from 1,600 to 2,970. The total spending of SSOs rose from \$2.8 to \$5.7 billion. By 1993, there were approximately 28,900 international SSOs worldwide.⁷⁰

Under the global associational revolution, SSOs were “seen as the ‘favorite child’ of official agencies.” In fact, the SSOs were so favored at this point that they just became “something of a panacea for the many problems of development.”⁷¹ The SSOs were replacing the state and the market. As J. Wagona Makoba observed, SSOs were “increasingly considered good substitutes for weak states and markets in the promotion of economic development and the provision of basic services to most people.”⁷² It seems that the social sector simply became another magic bullet to drive out the state and the market in economic development.

Either-or versus Both-and in Economic Development

From modernization theory in the 1960s, dependency theory in the 1970s, the market-friendly approach in the 1980s, developmental state theory in the early 1990s, to social sector theory in the late 1990s, scholars have been trying to argue that it is the state, the market, or the social sector that is key to economic development. However, David Lindauer and Lant Pritchett tried to swim against the tide, pleading for a “less polemic, more nuanced discussion.”⁷³ Joseph Stiglitz also stated that “the ideological debates should be over.”⁷⁴ Indeed, cannot the state, the market, and the

⁶⁸ John A. Mathews, “A Silicon Valley of the East: Creating Taiwan’s Semiconductor Industry,” *California Management Review* 39 (Summer 1997): 26-54, 31.

⁶⁹ Salamon, “The Rise of the Nonprofit Sector,” 109.

⁷⁰ J. Wagona Makoba, “Nongovernmental Organizations (NGOs) and Third World Development: An Alternative Approach to Development,” *Journal of Third World Studies* 19 (Spring 2002): 53-64.

⁷¹ Joel Montague, “The Fuss about NGOs—Are They Worth It?” *Nonprofit Management and Leadership* 9 (Fall 2003): 95-98, quotation at p. 96.

⁷² Makoba, “Nongovernmental Organizations (NGOs) and Third World Development,” 59.

⁷³ David L. Lindauer and Lant Pritchett, “What’s the Big Idea? The Third Generation of Policies for Economic Growth,” *Economia* 3 (Fall 2002): 1-39, quotation at p. 15.

⁷⁴ Joseph E. Stiglitz, “Towards a New Paradigm for Development: Strategies, Policies, and Processes,” Prebisch Lecture at UNCTAD, Geneva, 1998.

social sector work in concert to develop the economy? Is it not possible to strike a balance among the three sectors? In *Towards a New Paradigm for Development: Strategies, Policies and Processes*, Stiglitz suggests that “the issue [of development] is one of balance, and where that balance is may depend on the country, the capacity of its government, the institutional development of its markets.”⁷⁵

Some scholars of the social sector also argued that the three sectors should work together, instead of one driving out the other two. Peter Uvin, Pankaj S. Jain, and L. David Brown contended that SSOs should “not compensate for government failure or market deficiency by their own actions.” Preferably, SSOs should be “integrated into government and market institutions.”⁷⁶

Paola Perez-Aleman went a step further to delineate how the three sectors could work together. In Chile’s economic development, the state took action first. As Perez-Aleman described: “The state became actively involved in the search for new ways of organizing production, encouraging new standards of product quality.” Second, the state redefined the role of associations. Previously, associations in Chile used to manage to “get something from the state”; now they are “developmental associations” that “collaborate with the state to compete in markets.” Third, associations helped to “assist the upgrading of firms’ capabilities.” They transformed the relationships between the big and small firms. “Large ‘mother firms’ [helped] upgrade small suppliers . . . [and] enhance the collective capacity.”⁷⁷

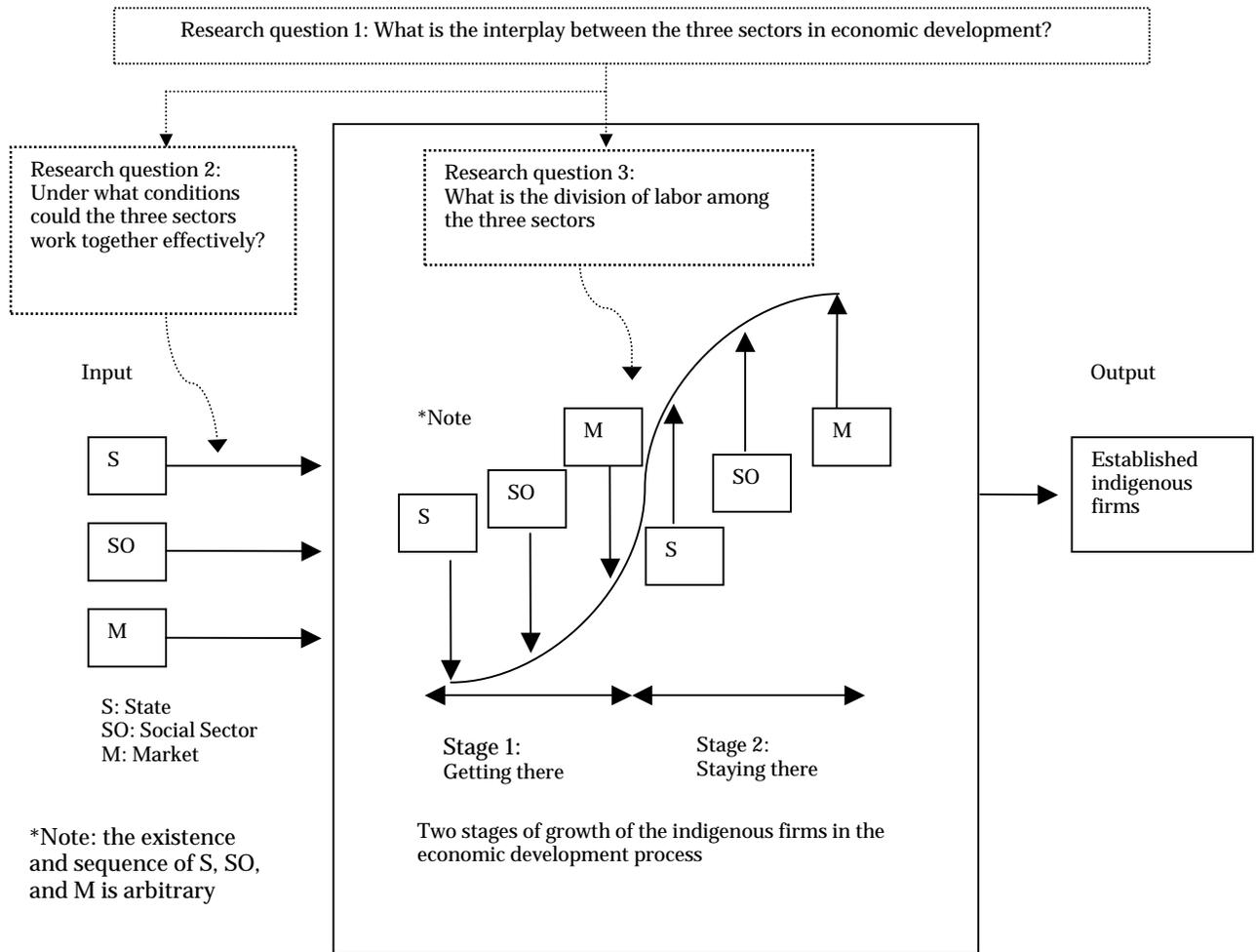
Research Questions

Should the interplay among the three sectors be a top-down process as described by Perez-Aleman? Was it a top-down process because of Chile’s Pinochet government? What would the interplay among the three sectors look like in other countries? Could it be a bottom-up process? These questions lead me to the following research question (see Figure 1):

⁷⁵ Ibid.

⁷⁶ Peter Uvin, Pankaj S. Jain, and L. David Brown, “Think Large and Act Small: Toward a New Paradigm for Ngo Scaling Up,” *World Development* 28 (Aug. 2000): 1409-19, quotations at pp. 1418 and 1409.

⁷⁷ Paola Perez-Aleman, “Learning, Adjustment and Economic Development: Transforming Firms, the State and Associations in Chile,” *World Development* 28 (Jan. 2000): 41-55, quotation at pp. 47, 48, 42.



Research Questions
FIGURE 1

What is the interplay between the social sector, the market, and the state in the economic development process?

This general research question can be broken into two questions. First, scholars advocating for the cooperation among the three sectors assumed that they would cooperate without question. These scholars did not shed light on the conditions that would enable the three sectors to work together effectively. This leads to the question: *Under what conditions could the state, the market, and the social sector work together effectively to develop the economy?* Second, most scholars have not differentiated as Mintzberg did between the two stages of economic development, “getting there” and “staying there.”⁷⁸ Amsden argued that the state disciplines

⁷⁸ Henry Mintzberg, *Mintzberg on Management: Inside Our Strange World of Organizations* (New York, 1989), 367.

firms to enhance their capability.⁷⁹ However, could firms “stay there” without the help of the state? We could apply the same criticism to associations (as Perez-Aleman discussed).⁸⁰ Once in the “getting there” stage, could firms stand on their own feet in the economy without the help of associations?

On the other hand, the main message of the market-friendly approach is the survival of the fittest and the strongest. However, small and medium-sized indigenous firms usually lack financial and technological resources to compete with giant multinational corporations on a level playing field. As a result, indigenous firms tend to be wiped out by the “perennial gale of creative destruction” brought on by large monopolistic enterprises.⁸¹ Indigenous firms would never have a chance to “get there,” let alone “stay there.” It seems that at different stages different sectors are required to develop firms. Accordingly, my final research question is: *What is the division of labor among the three sectors in the two stages of growth of indigenous firms in economic development?*

In order to explore these three questions, I examined three firms in China and three firms in Taiwan (see Figure 2). I chose China and Taiwan because they share the Chinese culture, but have adopted different economic systems.

FIGURE 2
Map of China and Taiwan



⁷⁹ Amsden, *Asia's Next Giant*.

⁸⁰ Perez-Aleman, “Learning, Adjustment and Economic Development.”

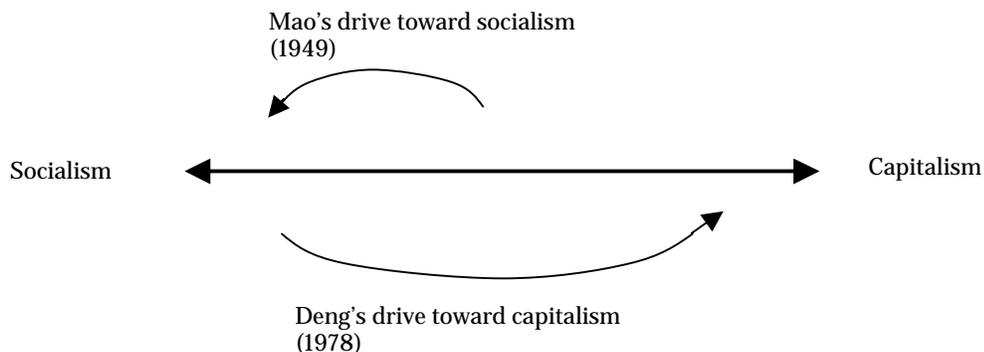
⁸¹ Joseph Alois Schumpeter, *Capitalism, Socialism, and Democracy* (New York, 1942), 84.

Socialist China. Upon the founding of the People's Republic of China in 1949, Mao Zedong drove China's economy toward communism. In 1951, China's government initiated the Five-Anti Movement, targeting businesspeople who committed the following five sins: bribery, tax evasion, theft of state property, fraud, and the theft of state economic secrets. In 1957, China launched the Great Leap Forward movement. Five years later, "all privately owned rented property was in fact taken over by the state in July 1958."⁸²

In 1966, Mao also launched a 10-year Cultural Revolution Movement, with the rationale that creating a New China required destroying the old traditions. Mao argued that Communist China should "destroy the four olds" (*po sjiu*—that is, old ideas, cultures, customs, and habits). He attacked Confucianism and regarded intellectuals as "stingy ninth-rankers," the lowest rank of Chinese society. As a result, Chinese culture began moving away from Confucianism.

However, when Deng Xiaoping took power in 1978, he turned Mao's policies upside down (see Figure 3). First, he drove China's economy toward capitalism. In the Third Plenum of the Eleventh Chinese Communist Party Congress held in 1978, Deng proclaimed, "China had gone too far in copying socialism from the Soviet Union and needed to move away from that path." He also strongly advocated the introduction of the mechanism of the market to China: "Markets had to be revived and allowed to flourish in order to enliven production and satisfy people's needs."⁸³

FIGURE 3
China's Economy under Mao and Deng

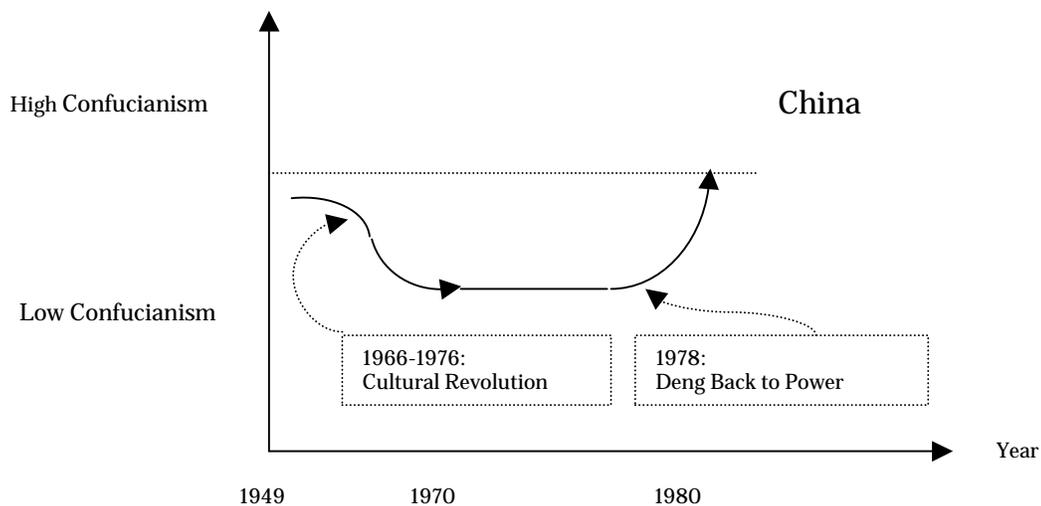


⁸² Trevor Jones Hughes and Evan Luard, *The Economic Development of Communist China, 1949-1958* (London, 1961), 101.

⁸³ From Ezra F. Vogel, *The Four Little Dragons: The Spread of Industrialization in East Asia* (Cambridge, Mass., 1991), 41.

Furthermore, Deng emphasized “Confucian educational thinking,” with its “respect for discipline and severe teachers” and its thesis that “knowledge [is] above all else.”⁸⁴ Deng respected the intellectual. In Congress he argued, “the intellectual is part of the working class.” As a result, the pendulum of Chinese culture began gradually moving back toward high Confucianism (see Figure 4).

FIGURE 4
Chinese Culture under Mao and Deng



Capitalist Taiwan. In 1945, the Kuomintang (KMT) began ruling Taiwan, a 36,179 square-kilometer island, 150 kilometers off Mainland China. Previously, Taiwan had been a colony of Japan since 1895, when the Qin Dynasty ceded Taiwan to Japan in the Treaty of Shimonoseki. The KMT fled to Taiwan in 1949 after its defeat by the Communist Party, which controlled Mainland China.

Between 1951 and 1965, the United States provided \$1.4 billion of financial aid to Taiwan, which “equalled 43% of the gross investment” in Taiwan during that period. The U.S. Agency for International Development (USAID) tried to drive Taiwan toward capitalism by emphasizing policies that promoted “private property, individual incentives, freedom of enterprise, and competitive markets.”⁸⁵

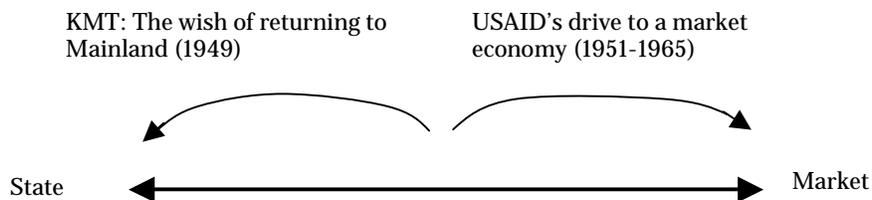
⁸⁴ A. James Gregor and Maria Hsia Chang, “Anti-Confucianism: Mao’s Last Campaign,” *Asian Survey* 19 (Nov. 1979): 1073-92, quotation at p. 1074.

⁸⁵ Neil H. Jacoby, *U.S. Aid to Taiwan: A Study of Foreign Aid, Self-Help, and Development* (New York, 1967), 51, 130.

Meanwhile, the KMT still maintained a strong state despite the burgeoning capitalism that was underway in Taiwan, because after the KMT retreated to Taiwan, “recapturing the mainland . . . remained a central preoccupation of the government.”⁸⁶ From 1949, the KMT government continued to assert that, first, it was the only legitimate government of China, and, second, it would inevitably return to control the whole mainland. Thus, the government of Taiwan could best be described as “hard authoritarianism”: “mainlander-technocratic rule under one-man dictatorship.”⁸⁷

The strict authoritarian government discouraged the growth of big business in Taiwan (see Figure 5). The KMT regime was afraid that “business influence would infiltrate the party.” It was also afraid that business would “undermine political discipline and bureaucratic loyalty.”⁸⁸

FIGURE 5
Taiwan’s Economic System under KMT and USAID



In 1966, Chiang kicked off the Movement of Cultural Renaissance in response to Mao’s Cultural Revolution. The rationale behind Chiang’s initiative was very simple: “The Red Guards are destroying the remaining vestiges of the Chinese cultural tradition; therefore, Taiwan must exploit this development by emphasizing at this moment that it is the preserver of Chinese culture.”⁸⁹ As a result, the culture of Taiwan under KMT was moving toward high Confucianism (see Figure 6).

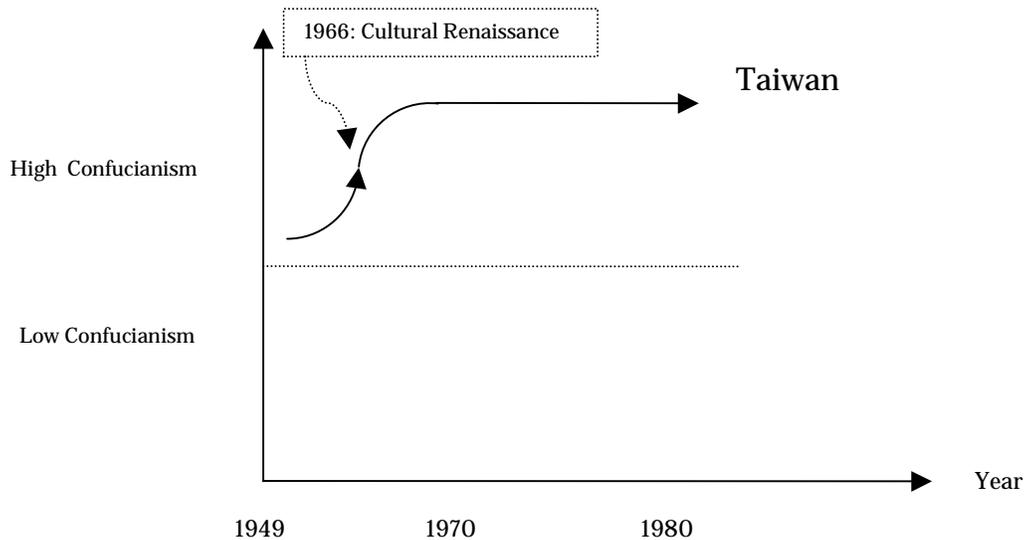
⁸⁶ Wade, “*Governing the Market*,” 77.

⁸⁷ Edwin A. Winckler, “Institutionalization and Participation on Taiwan: From Hard to Soft Authoritarianism?” *China Quarterly* 99 (Sept. 1984): 481-99, quotation at p. 482.

⁸⁸ Gregory W. Noble, *Collective Action in East Asia: How Ruling Parties Shape Industrial Policy* (Ithaca, N.Y., 1998), 15.

⁸⁹ Stephen Uhalley, “Taiwan’s Response to the Cultural Revolution,” *Asian Survey* 7 (Nov. 1967): 824-29, quotation at p. 826.

FIGURE 6
Taiwan's Culture under KMT



Sample Firms

I examine a number of firms to investigate the research questions established (see Table 2).

China's Legend Computer. Legend Computer was a spin-off of CAS. Upon its founding in 1984, Legend received from CAS the key technology that was later embodied in its blockbuster product the Legend Chinese Insertion Card. It also received its initial capital US \$ 24,000 from the CAS. The market share of Legend computer in China was 32.7 percent.⁹⁰ As of 2002, Legend Computer employed 10,792 people in Mainland China, its revenue reached US \$2.59 billion, and it was considered the number one personal computer (PC) brand in the Asia Pacific market (excluding Japan).

China's Great Wall Computer. China's Great Wall Computer was a state-owned company. In 1983, the Ministry of the Electronics Industry successfully developed the 0520 CH computer, the first computer in China that used Chinese character generation and display technology. It was capable of processing information in Chinese. In 1986, in order to commercialize this Chinese computer, the Ministry of the Electronics Industry decided to start up Great Wall Computer Corporation with initial capital of RMB \$3 million.

⁹⁰ Jason Dedrick and Kenneth Kraemer, *China IT Report* (Irvine, Calif., 2001).

Under the Seventh Five-Year Plan (1986-1990), Great Wall developed a series of computers. In 1987, it launched China's first 286 computer at the Beijing Exhibition Hall and produced twenty thousand of them in that year. In 1988, Great Wall launched China's first 386 computer. The market share of Great Wall in China was 5.2 percent.⁹¹ In 2002, the general manager of Great Wall stated that Great Wall was no longer on the radar of their competitors.

China's Advanced Technology Service Department. China's Advanced Technology Service Department, a technology consulting firm with initial capital of RMB \$200 located in the Zhongguancun area of Beijing, was created by techno-entrepreneur Chunxian Chen in 1980. Chunxian Chen is publicly recognized as the first mover in China's Information Technology (IT) industry in the 1980s. The entrepreneurship he encountered in the United States during his visit in 1978 inspired his start-up. Chen discontinued his business in 1996 after incurring a huge loss.

Taiwan's Acer Computer Company. Techno-entrepreneur Stan Shih founded Acer in 1976 with US \$25,000. In 1983, Acer was the first company to promote PC/XT products in Taiwan. In 1986, Acer introduced a PC based on the Intel 386 microprocessor, ahead of IBM (International Business Machines). As of 2003, Acer employs 7,800 people, supporting dealers and distributors in over one hundred countries. Its revenues reached U.S. \$4.9 billion in 2003. In 2004, it ranked twenty-fifth in *Business Week's* Information Technology 100.

Taiwan's United Microelectronics Company. The United Microelectronics Company (UMC) was spun off from ITRI in 1980. With UMC, ITRI hoped Taiwan could enter the semiconductor industry. UMC was ITRI's first spin off. ITRI transferred the technology commercialized at UMC from RCA in the United States in 1976. UMC was the first semiconductor company in Taiwan and later became the first company in Taiwan to license semiconductor technology to Western companies. It transferred 0.8-micron process technology to Germany's Thesys and 0.5-micron process technology to Germany's ITT Intermetal. In 2004, it ranked ninety-sixth in *Business Week's* Information Technology 100.

Taiwan's Vanguard International Semiconductor Corporation (VIS). Vanguard International Semiconductor Corporation (VIS) was a spin-off of the ITRI in 1994. With VIS, ITRI hoped Taiwan could enter the business of producing DRAM (Dynamic Random Access Memory) chips for the semiconductor industry. In addition, VIS was ITRI's last spin off. The technology transferred from ITRI was from its Sub-Micron Process Technology Development Project. The project, initiated in 1990, had a

⁹¹ Ibid.

TABLE 2
Initiators of the Sample Firms in China and Taiwan

	State	Social sector	Market	Successful or not
Legend (China)		X		Successful
Great Wall China)	X			Unsuccessful
Advanced Technology Service Department (China)			X	Unsuccessful
Acer Computer Company (Taiwan)			X	Successful
United Microelectronics Company (Taiwan)		X		Successful
Vanguard International Semiconductor (Taiwan)		X		Unsuccessful

Budget around \$200 million. Unlike the case of UMC, ITRI recruited high-caliber overseas Taiwanese engineers from the United States to develop the technology, instead of transferring technology from foreign companies. In 2001, due to a huge loss of NT\$ 6.4 billion (about US\$6.25 million)⁹² in the market, VIS switched its business from DRAM manufacturer to foundry service provider. In July 2004, VIS completely terminated all of its DRAM production and became a pure-play foundry. The godfather of Taiwan's semiconductor industry had the following to say about VIS: "I cannot help lament the death of my dream. As for VIS, I achieved nothing."⁹³

Following William Lazonick,⁹⁴ I will analyze the comparative historical experiences of the above three firms in socialist China and capitalist Taiwan. I have chosen the historical method because, as Schumpeter

⁹² *Commercial Times* (Taiwan): "Taiwan's Vanguard International, Powerchip Semiconductor report losses for 2001," China Intelligence Wire, London: Jan 31, 2002.

⁹³ Chang-Yung Liu, "Is the Submicron Project a failure?" Kaohsiung, Taiwan: National Sun Yat-sen University (2000) (in Mandarin, <http://cm.nsysu.edu.tw/~cylu/>).

⁹⁴ William Lazonick, *Competitive Advantage on the Shop Floor* (Cambridge, Mass., 1990).

noted: “Most of the fundamental errors currently committed in economic analysis are due to a lack of historical experience more often than to any other shortcoming of the economist’s equipment.”⁹⁵ Thus, tracking the histories of these six firms might provide me with insights into the interplay of the three sectors in economic development. According to Kathleen Eisenhardt, “Creative insight often arises from the juxtaposition of contradictory or paradoxical evidence . . . the process of reconciling these contradictions forces individuals to reframe perceptions into a new gestalt.”⁹⁶

These firms drew my attention because of their differences. First, Chinese firms and Taiwanese firms operate in opposing economic systems: socialist China and capitalist Taiwan. Second, the state (Great Wall), a public research institute in the social sector (China’s Legend and Taiwan’s UMC and VIS), or techno-entrepreneurs in the market (China’s Advanced Technology Service Department and Taiwan’s Acer) started up these firms. Third, three of the firms were successful (China’s Legend, Taiwan’s Acer, and UMC) and three were unsuccessful (China’s Great Wall, the Advanced Technology Service Department, and Taiwan’s VIS).

To study these six firms, I used information from personal interviews with managers (or others) and from secondary sources. Secondary resources include trade and business magazines, business and general newspapers, academic magazines and journals, annual reports and other publications of the organizations. I have conducted interviews at Acer, Legend, and the Advanced Technology Service Department. I have also obtained primary documents from Legend. For the other three firms, Great Wall Computer, United Microelectronics Company, and Vanguard International Semiconductor Corporation, I must rely on secondary documents. I will use multiple sources to ensure the validity and reliability of the data.⁹⁷

⁹⁵ Joseph Alois Schumpeter, *History of Economic Analysis* (New York, 1954), 13.

⁹⁶ Kathleen M. Eisenhardt, “Building Theories from Case Study Research,” *Academy of Management Review* 14 (Oct. 1989): 532-50, quotation at p. 546.

⁹⁷ Robert K. Yin, *Case Study Research: Design and Methods* (Newbury Park, Calif., 1989).