Endogenous Economic Growth in China

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China has enjoyed spectacular economic growth over the past twenty years or so. The Chinese leadership has utilized the country’s comparative and competitive advantages to reorient her economy toward export-led growth, has attracted a large amount of foreign direct investment, and has commanded a respectable trade surplus. Largely as a consequence, China is rapidly becoming a world-manufacturing powerhouse, based largely upon her abundant and inexpensive labor resources.

It is our view, however, that export-oriented growth has intrinsic limits in China, and that an alternative long-term growth strategy is worthy of serious consideration. The specific alternative we have in mind is based upon endogenous growth factors, especially knowledge generation and utilization. While China can perhaps continue to rely on exports, cheap labor, and a huge domestic market for foreign investment for some time to come, sooner or later the question will almost inevitably arise: How long can China sustain economic growth based on her current strategies?

Moreover, when the question arises it will almost certainly bring with it the concomitant question: Are there alternative growth models available, and if so, what do they look like and what do they imply for China? We think now is a good time for public policy makers and administrators to start to consider these questions.

Chinese regional economic development has in recent years relied heavily on foreign direct investment, export-oriented industrialization, and other traditional growth models. Accordingly, there has been a widespread hope that the Chinese economy will be able to cash in on China’s recent admission to the World Trade Organization. Such hope is undoubtedly positive and very exciting for both China and the rest of the world. However, we propose that individuals in positions of political and administrative leadership in China, especially those responsible for the design and conduct of economic development programs and policies, might nevertheless want to consider pursuing a parallel long-term growth strategy that emphasizes the utilization of domestic markets and especially endogenous growth factors. Thus, in this article we introduce the endogenous growth model, and focus largely on its treatment of knowledge as an

Abstract: China has enjoyed spectacular economic growth over the past twenty years or so. However, Chinese regional economic development has relied on foreign direct investment, export-oriented industrialization, and other traditional growth models. While China can perhaps continue to rely on exports, cheap labor, and a huge domestic market for foreign investment for some time to come, sooner or later the question will arise: How long can China sustain economic growth based on her current strategies?

We propose in this article the endogenous growth model as an alternative and long-term growth strategy, and focus largely on its treatment of knowledge as an independent factor of production in Chinese regional economies. This article thus proposes a new institutional framework defined as a trilateral commission. The commissions are designed to advise and enhance communication between local and regional government leaders and administrators on knowledge-based collaboration and coordination among business, government, and the research community, as well as on the issue of knowledge generation and utilization.
independent factor in production in Chinese regional economies.

The endogenous growth model implies that long-term sustainable economic growth and development in China is most likely to occur with an increase of technical knowledge, specifically through enhanced innovation. Active and full participation and collaboration by business, government, and the research community are apt to be instrumental to these ends. We, therefore, propose that individuals in policy and leadership administration positions in China consider setting up new institutions and organizations, designed to facilitate the creation and utilization of knowledge in the Chinese socio-political-economic sphere. More specifically, in order to establish a socio-political and economic milieu in which the conditions for creating and utilizing new technical knowledge are most likely to be found, Chinese political and administrative leadership might want to consider initiating and building trilateral commissions of business, government and university research officials. These commissions will be established to advise and enhance communication between local and regional government leaders and administrators on knowledge-based collaboration and coordination among business, government, and the research community. Our proposal specifically is to design and establish these institutions and organizations within China, so as to remove conceptual, behavioral and institutional constraints to knowledge growth and deployment. This will create an environment most likely to help generate, disseminate, and utilize new knowledge for regional economic growth and development.

Theoretical Background: Knowledge and Regional Economic Development

The export oriented view of regional economic growth and development prevails in China today, as it does in many parts of the world. It stresses that regions are developed from without (exogenously) rather than from within (endogenously). The associated theories and models lead to an emphasis upon expansion of the export sector as the best strategy to encourage regional economic growth and development. The basic idea is that capital and labor flow into the region, enabling its base of endowments of the factors of production to be utilized and related products to be exported, thus bringing in financial capital from outside the region and leading to development. The primary characteristic is the importance attached to exports as the primary causal factor and driver of the growth and development process.

The potential for export oriented theories and models to successfully function as a basis from which to prescribe regional growth and development policy is, however, limited in several ways, particularly insofar as identifying the major determinants of growth are concerned (Armstrong & Taylor, 2000). First, while they assume that the export sector is the exclusive source of regional economic growth and development, it is conceivable that this could develop as a consequence of forces and factors within the region, for example intra-regional trade or the utilization of endogenously stimulated advances in technical knowledge. Moreover, along similar lines the non-export sector as well as the export sector may enjoy productivity improvements stimulated by output growth. Second, the relationship between output growth and productivity growth is highly complex, and the evidence offered in support of efforts to understand it is controversial (Boulier, 1984). Third, export oriented theories and models do not specify, explain or otherwise help to understand what industries a given region has historically specialized in, or will specialize in as the future unfolds. This is pivotal, especially insofar as the applied value of any such theory or model derives from its accuracy in the prescription of what industries in a given region merit attention and investments by public policy makers and public administrators. Fourth, insofar as export oriented theories and models are not explicit with respect to their assumptions, they lack referential transparency (Warfield, 1990). Thus, any associated explanations of regional economic growth and development have been incompletely rendered, and any decisions and policy prescriptions based on such theories and models are more likely to lead to potentially serious unintended consequences.

In light of these limitations, our proposal is instead based conceptually upon the endogenous growth model (Romer, 1986, 1990). Rather than emphasizing the source of development from outside the region, it is based upon a view in which output growth is represented as a function of capital, labor and technological knowledge within the region. In contrast to export-oriented models, the underlying rationale is oriented around supply. That is, if a region can develop the capacity to produce new products, then a market for them will be found. The model postulates an aggregate regional production
function focused upon the contributions of capital, labor and technology to aggregate regional product growth. As supplies of capital and labor increase and as technical knowledge advances within the region, regional product grows ad infinitum. This view of economic growth and development does not ignore or deny the conventional growth-related factors related to the region’s natural endowments, industrial mix, population size, location, or the relative sizes and characters of the capital and labor stock. But it does directly place a relatively heavy premium upon unconventional economic factors, such as human capital investment (Mathur, 1999), community and institutional variables (e.g. leadership), learning and social capital (Stough, 2001), ethnic diversity (Rupasingha, Goetz, & Freshwater, 2002), and entrepreneurship (Armstrong & Taylor, 2000, pp. 76-78). There are several measures of such growth, including growth of output (e.g. Gross Regional Product), output per capita, and output per worker.

Inasmuch as the endogenous growth model accurately represents the processes of regional economic growth and development, it implies shifts in processes, programs, and policies for economic growth and development. One can formally deduce from the model that any given region’s aggregate product can increase only by increases in the capital to labor ratio (capital deepening) within the region or by improvements in the region’s development and utilization of technical knowledge (Armstrong & Taylor, 2000, pp. 66-71). To be perfectly clear on this point, capital investment makes it possible to substitute capital for labor in production processes, enabling the same number of workers to produce more output. Otherwise, the model implies that the sole alternative cause of regional economic growth and development is an endogenous increase in the growth and deployment of local knowledge. Thus, according to the model, growth of knowledge within a given region is a necessary, but not sufficient, condition for regional output growth. Among other things, this implies that there is a vital economic development role for universities and other social institutions and organizations, whose primary social function is to produce, preserve, transmit and find new applications for knowledge.

Since knowledge growth explains the source of technical change, usually with reference to human capital resources and particularly knowledge capital, the endogenous growth model raises the issue of how to understand and establish the conditions under which knowledge growth and enhancements in its utilization are most likely to occur (Johansson, Karlsson, & Stough, 2001). These conditions are at the core of any of its applications, so it is worth asking specifically what they are (Cracknell, 2001). For instance, what are the conceptual, behavioral and institutional conditions under which the advancement of knowledge in China can be made to proceed as expeditiously as possible? What, if anything, could Chinese public policy makers and administrators do to remove the constraints on innovative thinking, if not to actively encourage it? What can be done to speed up the adoption of innovation in the Chinese workplace? How can “the rules of the game” be changed, so as to create human capital accumulation and a stock of knowledge from which to realize the benefits of positive knowledge spillovers?

Of course, given that the endogenous growth model is simply an abstract representation of a set of perceived commonalities between myriads of complex and ever-changing circumstances throughout various regions around the world, there are no guarantees that in any given set of circumstances its application will be successful. Indeed, even under the best of circumstances, there are questions about knowledge growth and deployment are answered and the implied steps successfully taken, the effects on output growth may not occur for years to come. Increases in knowledge inputs in endogenous growth reliably effectuate regional economic development in the long run, not overnight. More specifically, the requisite periods of time must be at least long enough for the new knowledge to be developed and utilized, in such a way as to lead to more effective and efficient action (Schon, 1995). Though past a certain point, long-term economic development will not occur without knowledge growth. In the short term, knowledge growth alone does not guarantee an increase in regional economic output. That is, sometimes knowledge growth will lead to output growth and sometimes not, depending in part upon attendant levels of capital investment, the labor force, and the extent to which the newly produced knowledge is utilized in various economic production processes. Even if the conditions most conducive to knowledge growth and utilization in particular circumstances are identified and established, and as a consequence an increase in knowledge growth occurs, the process of setting the causal structures in place and then letting the causes propagate or transmit themselves into observable output growth can require a considerable period of time. Moreover, the period of time during which the causal process occurs is likely to be...
punctuated by a series of unproductive periods, before any significant effect on productivity or output growth is likely to be observed. Unless public policy makers and administrators are willing to make long-term commitments to knowledge growth and utilization, regional output growth is not apt to follow.

A key point here is that, whereas the endogenous growth model points clearly to the value of knowledge in economic growth and development, it depends not only upon the efficiency and effectiveness with which research is conducted and produces new knowledge at universities and other institutions of higher learning, but also upon the institutional arrangements through which such institutions relate to government and business. This is because, according to the endogenous growth model, in the long run regional economic growth and development depends upon the advancement and deployment of knowledge within the region. Thus, if China is to grow endogenously, especially given the size of its standing labor force and the difficulties it faces in attracting foreign investment, it must produce new knowledge. But more than this is required. The new knowledge must also be utilized. The potentially binding constraints on regional economic growth and development are determined not only by capital investment and the size of the labor force, but also by the conceptual, cultural, and institutional contexts through which new knowledge is produced, organized, marshaled, and combined with these other factors to provide the material needs and wants of society.

East Asian Experience and the Case of China

The endogenous growth model implies the removal of institutional constraints that inhibit the spread of ideas and knowledge. At the same time, it suggests the utility of governmental guidance in facilitating the growth and utilization of knowledge. For instance, governmental officials might consult with business leaders on regulatory policy, infrastructure building, the allocation of resources, and service provision. However, for such a relationship to be effective it cannot be a unidirectional; it is equally vital for business and education/research institutions to reciprocate in advising government on business development, R&D, market trends, technology innovation and investment ideas. Through mutual consultation and advice, both government and local institutions can cooperate in obtaining information, knowledge, and perspectives necessary for economic growth and development to occur.

The role government has served in the regional economic growth and development of East Asian tiger economies has been well documented (Berger & Hsiao, 1988; Deyo, 1989; Haggard, 1990; Wade, 1990; World Bank, 1993). Initially, the visible hand of government intervention was thought to be necessary to beat the cycle of poverty (Alam, 1989). Rent-seeking and predatory behavior was generally believed to have been insignificant, which helped explain why governments in E. Asia had not failed (Thompson, 1998). Such states’ successes were attributed to government policies characterized by sector-specific interventions, adoptions of export-oriented industrialization, state maintenance of a significant portion of the public sector, institutional arrangements resisting the pressures of rent-seeking, a merit-based and centrally controlled bureaucratic system, and a close working relationship between government and business (Amsden, 1989; Thompson, 1998; Wade, 1990). While those earlier studies focused on the benign and positive character of government, the post-financial crisis of 1997 revisionist literature has viewed the role of government with a critical eye. Mercantilist behavior, excessive intervention, mismanagement of monetary and fiscal policies, official corruption and crony capitalism have been linked to the developmental state and have been blamed for the Asian financial crisis (Islam & Chowdhury, 2000; Kang, 2002; Katz, 1998; Kwong, 1997; McLeod & Garnaut, 1998).

Past this point, there have been, in broad terms, three levels of state involvement (Perkins & Roemer, 1991). First, the state has played a major role in capital formation - as in South Korea and Japan - mainly to provide infrastructure investments. Second, the government has also intervened in the production and distribution of certain key commodities and services. Third, governments have wielded significant control over the private sector through central bank control of commercial bank interest rates, quota restrictions on the import of key inputs, and the utilization of discretionary taxes and administered prices.

In more general terms, although scholars differ in their views on the appropriate role of government and the magnitude of government involvement in regional growth and development, they tend to agree that governmental agencies and actors can promote economic growth through instruments of industrial policy, finance, and effective implementation of
strategies (Amsden, 1989; Johnson, 1982; Machietyre, 1994; Thompson, 1998; Wade, 1990). Moreover, there is fairly broad agreement that appropriate government intervention is market-based, well disciplined, and helps to promote domestic and international competitiveness (Islam & Chowdhury, 2000; World Bank, 1993). Accordingly, governments should not play an all imposing and controlling role in managing economic growth, but rather more of a market-conforming role. Bureaucratic capacity to design and implement policies and monitor industrial performances is a prerequisite to successful utilization of any of these instruments. In turn, this implies that a reasonably high degree of merit, competence, autonomy and knowledge of the state of industry and business is necessary for government agencies.

Studies on Chinese regional development reveal a similarly important role for state and government policies (Duckett, 1998; Fan, 1997; Hendrischke, 1999; Wang & Hu, 1999; Yang, 1997). Those studies focus on coastal development (Han & Yan, 1999), preferential policies (Rozelle, Park, Benzier, & Ren, 1998), local governments, (Duckett, 1998; Oi, 1996; Tan, 2002), and grand regional strategies (Wu & Song, 2003). Studies also find that different strategies, policies, and levels of governmental involvement have had mixed effects on regional development. For example, uneven regional growth and disparity were found to be a function of local government leadership (Tan, 2002)-a finding, by the way, that is consistent with the endogenous growth model as well as central government policies (Fan, 1997; Han & Yan, 1999; Johnson & Woon, 1997) and the so-called “trickle-down effect” (Zhao & Tong, 2000); while other studies showed that coastal strategies and government policies produced positive spillover effects and reduced regional disparity (Golley, 2002; Rozelle, Park, Benzier, & Ren, 1998). Another factor examined in terms of contributing to regional growth is, of course, direct foreign investment, especially in the Eastern part of China (Sun & Chai, 1998). Regional comparative advantages and proper use of local resources have also been recognized as essential to local economic growth (Chan, 1996; Hendrischke, 1999).

Conceptually as important as government policies, leadership, development strategies, and factor endowments, the role of knowledge in creating regional competitive advantage and growth in China remains a crucial aspect of regional economic development that demands to be further explored. The Chinese government recognized the importance of science and technology and even proposed a strategy resolution to “revitalize China through science and education” in 1995 (Lu & Shan, 2000). The government at that time made it clear that, in the view of the leadership, rejuvenation of the national economy and national prosperity rests with science and technology (S&T). Various state measures and policies concerning high-tech development, technology invention and application, and education were taken to ensure the realization of such S&T strategies. The state has also implemented several national S&T programs, such as the “Star Spark” and “863” plans, to speed up the utilization and application of high-tech inventions. However, China is still falling behind in terms of scientific knowledge production (research publications), technology innovation (R&D to GDP ratio), and in terms of S&T investment return rate (only one third of world average) (Hu, 2002; Li & Handberg, 2002). Despite the promise and potentials of state high-tech policies and programs, the national S&T system has yet to become an effective institution impacting national economy. Overall, state S&T investment is still insufficient and the institutional ability to generate new funding is seriously limited. The system is rather rigid and overly-centralized (Li & Handberg, 2002).

Setting considerations about capital investment aside, lack of effective S&T programs and institutional capacity to develop a knowledge-based economy is perhaps the most important challenge facing the Chinese government. There is, in our view, a tremendous need for the government to reevaluate S&T policies and programs, and to integrate such policies and programs into a knowledge economy that thrives in a liberal and decentralized economic environment. This is not to say that the state should be laissez-faire, but rather that the state should delegate power and resources to local governments, that will in turn work with local communities in creating a knowledge based economy.

Proposing a Trilateral Partnership Commission

It is in no way our intention here to argue that the demand-oriented approaches to regional economic growth and development are unimportant, but rather to focus upon the implications of the endogenous growth model, specifically in terms of the
relationship between knowledge and local institutional arrangements in China. Accordingly, the endogenous growth model emphasizes the importance of a broad array of intra-regional institutional and unconventional economic variables as major influences in creating and maintaining sustained economic growth and development. Some of these are variables over which local actors have considerable discretion. Especially insofar as a region's governmental institutions condition economic behavior, largely by setting constraints on the range of permissible human actions intended to organize the provisioning of material needs and wants, and by establishing channels of communication, the institutional arrangements within a region are prominent among them (Harrington & Ferguson, 2001). In particular, since, according to the endogenous growth model, long-term regional economic growth and development cannot occur in the absence of knowledge growth, the role of the research community within a region's institutional framework is vital.

A collaborative government-business relationship is an important piece of the puzzle in a related regional institutional framework. While the exact nature of these relationships differs with circumstance from region to region and country to country, in general the prevailing pattern of interaction between government and business confirms exactly what the endogenous model would predict -- such relationships are important in shaping regional economic growth and development (Johnson, 1988; Macintyre, 1994). When government-business relations are characterized by rent-seeking behavior, patron-client relationships, or government dominance and control of business, then this sort of imbalance between government and business can seriously harm regional growth and development. This is easily observed in many developing economies (McLeod & Garnaut, 1998). Conversely, in an economy where business is weak, government can easily dominate the relationship (Macintyre, 1994). For an endogenous growth economy to work, a positive, forward-looking, and interdependent government-business relationship is needed, in order to transcend narrow government or business interests so that both parties can work with the research community to generate and utilize new knowledge in regional development.

Separate institutions of research, education, regulation and business exist in China, but lack of coordination, cooperation, and communication among them in various places produces little synergy in producing, sharing and utilizing knowledge to spur regional growth. One study found that cooperation in planning and investment among regional cities can produce efficiency gains in a regional economic development (Byrnes & Storbeck, 2000). More often than not, absence of cooperation and collaboration is the norm, and not the exception in China. Studies on industrial parks showed local governments created various special development zones without overall synergy and efficiency gains, and often those industrial parks compete with each other. For example, the high-tech zone (yuan qu), the Singapore Industrial Park (xin qu) in Suzhou, and the two industrial parks in Nanchang all perform similar functions. The only difference is that each park answers to a different local authority. There is no doubt that high-tech parks absorbing foreign technology bridge the gap and help lead to home-grown technology (Walcott, 2002), but they tend to be sporadic and have little spillover effect. They need to be integrated into the fabric of regional knowledge-based economies from within a legitimate institutional framework.

Since, according to the endogenous growth model, regional economic growth and development depends in the long run upon the advancement and utilization of knowledge, both government and business can expedite the process by entering into cooperative arrangements with the research community to achieve viable and sustainable growth. This includes, roughly speaking, universities, research institutions, think tanks, and other knowledge generating and disseminating institutions and organizations. However, studies confirm that currently there is disengagement among the three parties regarding cooperation of business enterprises, universities, and scientific research institutions (CEUSRI). The Chinese government has so far demonstrated little support for CEUSRI and the research community has yet to come out of the ivory tower, supplying economic development with the necessary brain power (Shi, 2002, pp. 371-379).

To better serve economic growth and facilitate cooperation and communication among the three major relevant parties, we propose that Chinese leadership consider forming trilateral government-business-research commissions, in which each of the three components focuses on the needs for interaction and cooperation, and fulfills such needs as necessary for long term regional economic growth. These trilateral commissions can establish an institutional framework that should be entrusted and empowered to carry out the crucial task of
knowledge generation and utilization for regional economic development. For such a commission to be effective and efficient, it is important that it has the authority to report directly to the heads of government, not only in the capacity of advising, but also in formulating policies affecting the local and regional knowledge economy.

How can such a triangular relationship be institutionalized so that the three parties can interact cooperatively and communicate effectively? In most regions and cities in China, governments have agencies that deal with business or education, but rarely have super-agencies been created and devoted to such triangular dialogue. Reforms on local government only focused on eliminating redundant agencies and reducing government employees (Chen, Chen, & Zhang, 2002, pp. 35-50). A regional inter-governmental commission consisting of top government officials and bureaucrats, business leaders, and top educators/researchers could be a good place to start. Top officials are capable of setting directions and making decisions, while bureaucrats are capable of grasping issues and new ideas and formulating them into policy recommendations. Since the results of their decisions are oriented toward the long term, selected individuals need to be development-oriented, and not to be subject to short-term political gains and considerations. They should also be able to withstand public and special interest pressures, and to resist any rent-seeking temptation. The commission should not be attached to the economic commissions (jingwei) or planning commissions (jigwe) of local governments, or to the newly created state development and reform commission. Rather, it is imperative that it remains administratively independent and is only answerable to heads of government in charge of regional economies. This arrangement would provide the commission with a most prominent position in influencing education, research, technological innovation, and regional development strategies, and in ensuring effective knowledge utilization and application.

The trilateral commission should recognize and accept that bureaucracy is an important part of the government administration, capable of policy formulation and implementation. As our aforementioned brief review of East Asian experiences show, bureaucracy needs insulation from politics so that it can formulate the best policy possible for development. At the same time, it needs autonomy in carrying out policies impartially and effectively. To build up bureaucratic competency and efficiency, it is vital that a merit-based recruitment system (rather than political hiring) is created as a starting point. Bureaucratic career advancement should be solely dependant on competency and achievement, not on political favors or any other corrupted methods. All of these may not guarantee an effective bureaucracy unless bureaucratic players are charged with some sense of importance and empowerment. They need to know not only that what they are doing can potentially make a difference in regional economic growth and development, but that they, in fact, have the power to make such a difference. Bureaucratic participation in the trilateral commission can invest them with a great sense of importance and power.

The research community consists of colleges, universities, research institutions, and various brain trusts. Apart from their normal operations, the main function of the research and education community in this triangular relationship is to facilitate government and business in churning out new ideas, testing ideas, and transforming ideas into knowledge and technology. Both government and business stand to potentially benefit from incorporating the research community into this new relationship. For instance, growth-oriented government is often at a loss as to specifically what type of businesses should be promoted, what type of new technologies should be targeted and what new industries created. While business and government can each provide some of the answers, it is the research community that is in the best position to provide the latest ideas, knowledge, and research. Moreover, businesses need fresh ideas, research results, and well-trained human resources from the research community. In today's world, many new technologies are created in research labs and scholarly works. Industries often contract with universities to develop new research and technologies, thus better enabling businesses to concentrate on operations and market competition. This is often known as research outsourcing, and it is gaining momentum, since it is cost-effective and forward-looking. The research community plays an indispensable role in any technology-driven economy.

The research community is an important partner in this trilateral relationship, not only because it possesses intellectual resources and brain power, but more importantly because it serves as a bridge between government and business; making policy inputs, engaging research, and transferring knowledge into productivity. In knowledge economies, research communities play a key role in connecting the frontiers of science to regional
economic growth and development, and turning knowledge into new businesses. Colleges and universities are often at the center of the research community and their potentials for impacting the local economy are often not fully realized, especially in the age of new economies. Colleges and universities have invaluable human and knowledge resources that the local economy can tap into. They can impact local economies by ways of offering new ideas, knowledge, and research, spinning off new businesses, and producing education-related externalities. To enable them to play an important role in regional economic growth and development, leadership is crucial in directing the research community to interact and communicate with government and businesses. A trilateral commission, including heads of universities, research institutions, and prominent scholars, researchers, and scientists, is one potential vehicle for linking the research community to the government and businesses. Such leadership can potentially be capable of three way communications: organizing and mobilizing intellectual resources, advising the government, and partnering with businesses. The commission plays more than a coordinating role in the community; it is a role of true leadership in working closely and intelligently with government and business to map out a trajectory for local economic development.

Unlike American businesses that often involve themselves in the civic life of the local community in which they are located, the business community in China is typically rather loose and unconcerned with local well-being. It is important that a trilateral partnership not to be rendered ineffective through its institutionally decentralized nature. One way to deal with this problem is to organize the business community into several umbrella associations based on the nature of the business. Throughout China, different businesses have already formed their own associations (Chen, 1997; Pearson, 1997). Industry-wide or sector-based associations offer several advantages, when it comes to dialoguing with the government. First, they often share the same concerns and problems regarding regulations, market competition, and business development. Second, associations tend to raise issues and concerns that seem to be fundamental and long-term rather than firm-specific and short term. Third, it is easier for the peak associations to represent and participate in the triad dialogue and then distribute any public good coming out of the partnership amongst the respective members, than for individual firms to represent themselves. Such umbrella associations cannot exist as “bureaucratic appendages” (Foster, 2002) and need to be led by strong, forward-looking business leaders, who assume the role of advising government officials on important business issues.

The mandate of such a trilateral commission is obviously the growth and development of regional knowledge-based economies. Among the many related issues, one of the most important has to do with the creation of competitive advantage derived from a well configured regional set of factor endowments, firm strategy, structure and rivalry, demand conditions, and technological and policy innovations (Porter, 1990). The goal is to create innovative products and services that can function as a future engine for growth and as the key part of strategic trade, aimed at bringing into the region long-term trade benefits. As East Asian studies have shown, competitive advantage enabled the tiger economies to create types of industries that eventually grew to become competitive in the global economy. A well-known example is South Korea’s semiconductor industry (Mody, 1990; Yoon, 1992). Traditional comparative advantage is mainly based on factor endowments leading to differentiation of products and services, which are often lacking among regions and cities in China. Since technological innovation and policy support are necessary to create competitive advantages among business, research, and government, a trilateral commission is in a better position to coordinate, maintain, and utilize cooperation and partnership among these three parties for regional growth.

Parties in such a trilateral commission all stand to benefit. For the government’s part, policy innovation is the key. Accordingly, the research community can provide ideas, knowledge, and advice to the government in defining such policy and searching for the most likely points of competitive advantage. Long-term industrial policy formulation needs to include knowledgeable input and financial incentives, as well as tax and credit support, all of which can be supported by the research community. On the part of the research community, grant support from government and businesses can help solve funding problems and sustain basic research and education. A strong voice from the research community in the commission can influence government education policy. Similarly, the research community can benefit from a close relationship with businesses in promoting training, education, and research. Knowledge application and utilization cannot be implemented without active precipitation of
businesses. Fortunately, such a relationship is symbiotic. Both businesses and the research community are concerned with technological innovation and knowledge application. The willingness of business to work closely with the government and to orient business development and investment toward such long-term goals is equally important. The research community can help the government and business with its brainpower in research and development. On the part of business, knowledge utilization and application can help solve the problem of lack of differentiation of products and services, which is a common concern amongst Chinese businesses. The creation of competitive advantage helps regional business reach critical mass. Once this point has been reached, it is then possible for one economy to become different from others, but more importantly, it deters other economies from engaging in similar businesses due to its huge size, high entry barriers, and infrastructure advantages. Once competitive advantage is created, it should be able to act as an engine of growth, and other businesses may evolve and develop around this core business. At the initial stage, government support is needed to encourage new businesses, spin-offs, and investment from other regions. Eventually, businesses should stand to compete on their own. Once the point of critical mass has been reached by business in a certain region, snowballing effects take place (cumulative or positive circular causation), attracting still more outside investment, supporting further businesses, and securing new customers.

There are a lot of things that a triadic commission, such as the one we propose here, can do in helping build up regional economies within China, primarily through knowledge generation and utilization. But the most important implication of such a commission is that it provides a new institutional framework that makes up for the existing institutions' inability to implement knowledge growth and application. It promotes pre-growth policy, builds sufficient infrastructure for business competitiveness, and knowledge infrastructure for education, basic research, technology transfer, knowledge growth and dissemination, and technological spin-offs.

Conclusion

Regional economic growth and development encompasses a wide range of concerns, many of which are directly relevant to public administrators. Among these are those related to the formulation and implementation of public policy for increasing the competitiveness of a region's industries.

Export-oriented theories and models present serious limitations, identifying and explaining the determinants of regional growth and development. Japan for years relied on export as an engine of growth, but eventually fell flat when her export competitiveness was hurt by a combination of rising yen and the decline of her export markets. East Asian export economies experienced financial crisis, largely triggered by the worsening of current accounts due to decline of export. Both cases shared one common problem, dependency on export. Japan is the second largest economy in the world, but falls far short of being the second largest market in the world. The lackluster domestic demand simply cannot absorb the excessive capacity of production. This is an important lesson for China when looking to sustain economic growth. China needs to cultivate her own domestic market and knowledge-based development. This is not to say that China won't be affected by changes in the international business environment; after all, the Chinese economy has been even further integrated into the global economy, since joining the World Trade Organization. But, with a large domestic market and endogenous growth driven by knowledge and technological innovation, China can expect to minimize deleterious external effects and sustain long-term economic growth.

The emergence of the endogenous growth model in the past decade has, however, led to considerable and renewed interest in unconventional economic factors behind growth, largely for two reasons. First, they rectify a widely recognized weakness in earlier (exogenous) models, specifically by making the growth and deployment of technical knowledge an explicit and independent part of the regional growth function. Second, they suggest tangible ways that government actors can act, so as to speed up regional economic growth and development, specifically by establishing the conditions under which the advancement of knowledge proceeds as expeditiously as possible. Accordingly, with respect to increases in the stock of knowledge, to the extent that China can establish and maintain an institutional environment conducive to the creation, transmission, preservation and application of new ideas, its industries will have a continuing advantage over those in other countries and regions less capable of producing their own ideas. As a consequence, those others will have no choice but to continue to depend far more upon acquiring new technical knowledge.
that originated in China.

The role of knowledge and its utilization can be enhanced by the removal of obsolete conceptual, behavioral and institutional constraints, and the creation of new institutions conducive to knowledge development and utilization. The Chinese market economy is still in an early stage, and many existing government policies and institutions that initially evolved within the context of the previous command and control type economic system still persist today. Some of the existing institutions are either insufficient in handling knowledge growth and application, or are incapable of excusing themselves from policies, programs and practices that inhibit and impede knowledge growth and deployment. This article thus proposes a new institutional framework defined as a trilateral commission that brings government, businesses, and research communities together to act jointly as a chief adviser to governments on the issue of knowledge generation and utilization. This commission is not another regulatory agency. Nor is it a funding machine. Rather, it is a market supporting institution with the sole purpose of cultivating and maintaining the conditions under which new knowledge can be created and deployed through education, training, consulting, research, communication, and policy development, and through which such knowledge can be integrated into regional economic development programs and policies. Such a commission is a forward-looking conception, designed to bear the full brunt of new knowledge-based economic waves and to help regional economies create their own competitive advantages and economic niches in a globally competitive economy.

Perhaps the most basic public policy implications of the endogenous growth model and the proposed institutional framework have to do with the conditions generally conducive to the evolution and growth of knowledge in China. In this respect, recent developments in the study of effective scientific inquiry, some of which are documented in this paper, indicate that public policies designed to help remove behavioral, conceptual and institutional constraints on inquiry, and on communication of the products of inquiry, are most likely to enhance the rate of knowledge growth. This is because the rate of knowledge growth in a region at any given time is equal to the variance of ideas within the region at that time. Institutional arrangements that protect the mechanisms through which variation in ideas is created, such as subsidies that have a positive effect on a region’s intellectual capital accumulation, or protection of individual researchers from institutional censorship or discipline on account of their ideas, thus tend to expedite regional economic growth and development.

Endnotes

1 An earlier draft of this paper was presented at the 1st Sino-US International Conference on Public Administration in Beijing, China, June 16-17, 2002. The authors would like to thank the anonymous reviewers for their constructive comments and suggestions.

2 For instance, some reference to individuals is a necessary condition for any full explanation of social phenomena (Kincaid, 1995). Yet export theories and models tend to disregard the fact that the factors which direct a region’s market and the determination of its prices are inextricably rooted in human decision processes. In these processes individuals with distinct and identifiable personalities, each at times functioning as a producer and at times as a consumer, through purposive actions, make conscious and deliberate choices to aim for particular ends, rather than functioning as automata that, in essence, actuate the “mechanisms” of the regional market.

3 Assuming a standard constant returns to scale form of a Cobb-Douglas production function, the endogenous growth model may be formally expressed as $Y = K^\alpha AL^{1-\alpha}$ where $Y$ is output, $K$ is the stock of capital, $L$ is the labor force, $A$ is technical knowledge, and $\alpha$ is a "constant returns to scale" parameter. Note that in this formulation technical knowledge is an explicit determinant of output, and is no longer entered as the mean effect on output of all the excluded variables.

4 Theoretically, though with some risk of oversimplification, one may categorize the causes of the rates of growth of capital, labor, and technological knowledge increase within a region into a couple of categories. First, the growth of capital is partially a consequence of migration of the factors of production and partially of investment in capital stocks by the region’s residents. Accordingly, capital tends to migrate into the region whenever returns on capital investments are relatively high, and to migrate out whenever they are relatively low. Returns on capital investments tend to be relatively high when wages are relatively low. Thus, there is reason to think that high rates of capital growth will
occur in relatively low wage China. Second, the growth of the stock of labor is partially a consequence of endogenous population growth and partially of immigration in response to relatively high wages within a region. Third, improvements in technical knowledge are a consequence of endogenous investment in research and development and education, together with importing it from other regions.

On this account, there is reason to think that capital and labor will migrate in opposite directions. To the extent that for whatever reason within a given set of regions capital is more mobile than labor, for instance because the capital is embodied in high technology, it will likely tend to migrate between regions at a higher speed than will labor, in which case capital will tend to move into relatively low wage regions faster than labor will move out. Thus, low wage regions will tend to experience higher rates of growth. The opposite will tend to occur if labor is more mobile than capital. However, absent estimates of the relative speed at which capital and labor are moving, it is not possible to predict empirically, for any given region, whether these factor movements will lead to a net increase or decrease in regional output.


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References


Golley, J. (2002). Regional Patterns of Industrial Development during China's Economic


