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China's Development Dilemma: Property Rights and Growth

Abstract

China's economic reform program has eliminated many of the inefficiencies of central planning and opened-up China to foreign trade. China's reform program has not, however, done much to promote investment in new technologies, which is the source of steady-state growth. This is in stark contrast to the post-war growth history of Japan, where the adoption of new technologies has been rapid. Using the Solow growth model to provide a taxonomy for China's recent growth history, we argue that after the effects of one-time increases in efficiency are exhausted, China's period of relatively rapid growth will likely end. The reason why is that the use of discretionary fees and taxes significantly attenuates an important property right--that of being a residual claimant--which reduces the rate at which new technology is adopted. This implies that China's true steady-state rate of growth may actually be *lower* than the steady-state rates of growth of developed nations. If true, China will eventually return to the circumstances of the 70's, when it was experiencing a growing gap between the standard of living of its population and that of the developed world. In light of advances in telecommunications and China's opening-up to the rest of the world, a widening gap in living standards will almost certainly precipitate another growth crisis. But unlike the last growth crisis, the Chinese leadership will not be able to produce another round of rapid increases in the standard of living by re-adopting reforms that are already in place.

China's Development Dilemma: Property Rights and Growth

1. Introduction

Nearly twenty years after the beginning of China's economic reform program, its rate of economic growth continues to be among the highest in the world.[1] This high rate of growth, coupled with China's size and status as a nuclear power, has led many to argue that US foreign policy should switch from its historical focus on Europe to East Asia--particularly China and Japan. More recent events, such as the launching of missiles into the Taiwan Straits before the 1996 elections in Taiwan, have only served to strengthen the call for such a shift in foreign policy focus.

Implicit in the calls for increased foreign policy focus on China is the expectation that the Chinese economy will continue growing and developing at a high rate, eventually approaching a level of development comparable to that of neighboring Taiwan, Singapore, South Korea and even Japan. In this paper we point out that such an extrapolation is based on the assumption that China's steady-state growth rate is comparable or even greater than that of developed nations, an assumption which we will argue is highly questionable even in the face of persistent high rates of *observed* growth. To be specific, we advance the argument that China's recent growth history masks a fundamental property rights problem which limits China's steady-state per capita growth rate by reducing its ability to generate intensive growth. Unfortunately, the reform program has done little to promote technologically driven intensive growth and, contrary to the post-war growth history of Japan, there is little evidence to suggest that intensive growth has played an important role in China's high rate of growth over the last two decades (Chow 1993).

We use the Solow growth model to illustrate how rapid extensive growth from the reform program should be interpreted as: 1) China's moving closer to its potential output by eliminating

many of the inefficiencies of central planning, and 2) China's catching-up to a new, substantially higher steady-state level of real output per capita which was brought about by one-time but dramatic changes in China's institutional landscape. We then explain how the use of discretionary fees and taxes attenuates secure residual claimant status in China, leading decision makers to have a systematic bias against investments in the implementation of new technologies.[2] While the use of discretionary fees and taxes has deep historical roots, we believe this is fundamentally an incentive alignment problem rather than a cultural one. In the context of the Solow growth model, we show that this bias reduces the rate at which new, higher steady-states are generated in China by the adoption of technological advances which are the source of intensive growth.

Previous work in this area has tended to emphasize how the absence of well-defined property rights increases transactions costs and, hence, reduces economic efficiency (Cheung 1982, 1986, 1990; Dorn 1990; Myers 1988). In this paper we take a rather different approach, identifying a specific mechanism through which the absence of bona fide property rights--as understood in the European tradition--affects the incentives of decision makers in a way that lowers the rate of intensive growth. Since only intensive growth can generate rising real output per capita in steady-state, this paper raises the following question. Did China's leaders inadvertently develop a reform program that is only capable of producing rapid growth in the near term, thereby simultaneously raising the expectations of its people and the risk of future disappointment at the same time? This is an important question for the political stability of the Asian continent, for if China finds that it cannot generate steady-state growth through intensive growth, its leadership might be tempted by internal unrest to generate extensive growth at the expense of its neighbors.

2. A Taxonomy of China's Recent Growth History

Let real output, Y, be given by the homogeneous of degree one aggregate production function:

$$Y = F(K,L), \tag{1}$$

where L is labor and K is capital with $F_K, F_L > 0$. Since F() is homogeneous of degree one it can easily be shown that $F_{KK}, F_{LL} < 0$. From this definition it is immediately apparent that Y can rise by either increasing the employment of K or L, or by changing how K and L map into Y by altering F().

When Y increases over time because K or L increases over time, the increase in Y is said to be extensive growth. When Y increases over time because F() has changed, the increase in Y is said to be intensive growth. There is no doubt that China has experienced rapid growth in the last two decades. The key issues for this paper is how much of that growth is extensive in nature versus intensive in nature and whether China's system of property rights retards the latter.

Since F() is homogeneous, we can rewrite (1) in terms of labor (per capita) units. Dividing (1) by L, we have:

$$y = f(K/L) = f(k), \tag{2}$$

where y is real output per unit labor and k is capital per unit labor. In his pathbreaking article, Robert Solow (1956) demonstrated that y can grow in steady-state only if an economy experiences a stream of productivity improving innovations in the structure of f() in steady-state. The intuition behind this result is that for any given f(), there are diminishing returns to the application of more capital per unit labor, so eventually the increase in output engendered by one

more unit of capital per unit labor is no longer greater than the rate of depreciation of the capital base per unit labor.

In Figure 1, f(k) depicts real output per unit labor, y, as a function of capital employment per unit labor, k. The concavity of f(k) reflects the diminishing returns discussed above. Let s equal the proportion of real output saved each period. It follows that sf(k) equals saving per unit labor as a function of k and that consumption per unit labor, c, is given by: $c = f(k) - sf(k)$. Let δ equal the rate of depreciation, so δk is the depreciation of capital per unit labor per period. For the level of k to be stable, additions to the capital stock (investment) must equal the rate at which the capital stock is depleted (depreciation). Therefore, in steady-state, saving per unit labor, sf(k), must equal depreciation per unit labor, δk. The steady-state level of capital per unit labor is given by k^* and the steady-state level of real output per unit labor is given by y^* in Figure 1.

Since in the Solow growth model all factors are assumed to be fully and efficiently employed, per capita growth occurs in only one of two ways.[3] First, the economy might find itself at a point like y' in Figure 2. Here capital employment per unit labor, k', is lower than the steady-state level, k*. This implies that the level of investment per unit labor, I, exceeds the level of depreciation per unit labor, δk. This generates a net increase in the amount of capital per unit labor, Δk, which increases output in future periods (graphically, this slides us northeast along f(k) and sf(k), generating higher levels of y along the way). This is per capita extensive growth in the context of the Solow growth model.

The second way in which per capita growth occurs in the Solow growth model is that technological innovations can improve the rate at which K and/or L are transformed into output, which increases total factor productivity, lifting f().[4] For any given s, this lifts sf(k) and f(k),

defining a new, higher steady-state value for y.[5] This is per capita intensive growth in the context of the Solow growth model. When a technological innovation lifts f() upward, it follows that the economy must then catch-up to the new steady-state. In this way, intensive growth engenders extensive growth in subsequent periods. In the Solow growth model, extensive growth occurs in transition between old and new steady-state. Indeed, the observed growth rate generated by innovations--intensive growth--is actually extensive growth generated in transition between the old steady-state and the new steady-state which was brought about by the innovation.

The Solow growth model demonstrates that without technological innovations to improve the rate at which K and L are transformed into output, the steady-state rate of growth of real output per unit labor is zero. Such innovations are now recognized as the key to generating rising real incomes per capita over time. An important feature of the Solow growth model is that such innovations are treated as exogenous events. A substantial literature has since emerged to explore the possibility that improvements in f() might be endogenous.[6] Whether the process by which f() is improved is exogenous, endogenous or both is not relevant here. What is relevant is that it be understood that anything that reduces the rate of implementation of technological innovations will slow down the production of new, higher steady-state values of y.

Institutional Innovations as Sources of Intensive Growth

Strictly speaking, in the Solow growth model improvements in technology are viewed as the only source of steady-state growth. Others have argued that things such as education and government investment in infrastructure might also increase total factor productivity (Mankiw 1994). Recent work by North and Wallis (1994) more directly challenges the strict technological view. By lowering transactions costs and increasing the range market activity, institutional

innovations might also raise total factor productivity at both the aggregate (macro) level and the firm (micro) level.[7] In terms of the Solow growth model, this means that changes in the institutional landscape might increase total factor productivity, thereby lifting the steady-state value of y in much the same way that a technological innovation would. They write:

> Rather than viewing institutional change as a way of implementing technical change, our framework allows for institutional change to be an important and independent source of growth. Technical change also has a broader impact, sometimes changing transformation costs, but sometimes changing transactions costs directly (North and Wallis, 1994, p. 610).

This observation raises the possibility that changes in the institutional landscape might increase total factor productivity thereby lifting f() upward and generating a new, higher steady-state y.

One Interpretation of China's Recent Growth History

Suppose a steady stream of technological and institutional innovations for a given economy generates, on average, an increase in real output per unit labor of r percent per period. The growth path of such an economy could be described by:

$$y_t = \theta e^{rt}, \tag{3}$$

where t denotes the time period and θ is a scaling parameter which reflects the size of the base on which the growth rate is applied. Given this definition, r can be interpreted as the economy's steady-state growth rate since r is a reflection of the rate at which new, higher steady-states are generated by technological and institutional innovations which raise total factor productivity.

When viewing growth data which is based on calculations of year-to-year percent changes in real output per capita one cannot tell, without additional information, whether the change in y for any given period was the result of r or of a one-time increase in θ.[8] In short, high observed

growth rates *ex post* do not necessarily imply high steady-state rates of growth. If we think of growth in terms of (3), for example, it is immediately apparent that with a succession of one-time but permanent increases in θ over time, y_t can rise *steadily* over time even if $r = 0$. Moreover, if events which generate one-time increases in θ have lagged effects, a singular event might generate what looks like steady-state growth for quite some time. As a result, it is possible that what we are observing in China is a high rate of growth that is the product of a succession of dramatic, one-time improvements in output, possibly with lagged effects, which resulted from the lifting of socialist constraints on the market economy and the opening-up of China to foreign trade. Specific reforms included decentralization of economic decision-making authority to officials in middle and lower levels of government, the loosening of restrictions on commerce and other service activities, and the according of increased management autonomy to agricultural and industrial producers.[9] The problem is that while both events may have permanently increased real output per capita in China, neither are the source of steady-state growth.

To clarify this point further, let θ^* be an economy's *potential* growth base. This is the economic base under the assumption of full and efficient employment of resources and is analogous to the idea of being on the production possibilities frontier rather than inside of it at any point in time. When $\theta < \theta^*$, we can enjoy a one-time increase in real output per capita (possibly with lagged effects, but one-time nonetheless) by simply removing the constraints which forced θ below θ^*. It is well-understood that one source of China's very rapid growth over the last two decades has been the removal of many such (socialist) constraints which has had the effect of moving θ closer to θ^* in each time period, t. The removal of socialist constraints has increased the extent to which markets allocate resources and has generally reduced the transactions costs of

commerce, thereby expanding the number of mutually beneficial transactions possible at any point in time for any given set of resources and any given state of technology.[10] This, in conjunction with political stability and the benefit of one-time Ricardian efficiency gains due to China's opening-up to foreign trade, has driven θ much closer to θ^* for China and is likely responsible for some of the rapid increase in y over the last two decades.

While China has adopted many economic reforms which may have moved θ toward θ^*, there remain many significant impediments to economic activity. This suggests that China may continue to enjoy growth which is driven by θ approaching θ^* if China continues to liberalize, even if r is zero. The problem is that unlike future technological innovations whose number is potentially unbounded, the number of constraints which can be removed to drive θ up to θ^* is finite. This means that once China achieves its steady-state y (that is, once k catches-up to k^*) and θ gets as close to θ^* as it is going to get and all of the aforementioned lagged effects have played out, China will begin growing more slowly. How much more slowly depends on the rate at which new technological and institutional innovations arrive.

Another possible effect of the reform program was that it produced a set of one-time institutional innovations which, by altering the institutional landscape in ways that increased total factor productivity, lifted f() and generated a new steady-state above the pre-1978 steady-state. In principle, this would be the effect of implementing the sum of all institutional innovations which China did not adopt during its years of strict central planning. This may have generated a great deal of extensive growth as the Chinese economy tried to catch-up to the new steady-state. While the rate of growth has been impressive, this can only be considered steady-state growth if one believes the institutional landscape can be continually improved in steady-state.[11] To summarize,

there are two ways that the reform program may have generated nonsteady-state growth. First, it removed impediments which were pushing θ below θ^*. The removal of these impediments generated one-time but permanent increases in y. Second, it led to one-time institutional innovations which lifted f() up, thereby generating extensive growth in transition between the old and new steady-state levels of y. The latter should be regarded as a set of true, albeit only one-time, innovations which increased total factor productivity, while the former is nothing more than the removal of socialist constraints.

With this taxonomy, one way to view the impact of the reform program on economic growth is that the removal of socialist impediments to economic activity drove θ much closer to θ^* while true innovations in the institutional landscape generated a new, substantially higher steady-state y. Both engendered a high degree of extensive growth as unemployment and underemployment of resources which resulted from socialist constraints was reduced while the Chinese economy simultaneously tried to catch-up to its new steady-state. But neither of these consequences of the reform program will engender a steady stream of new innovations, institutional or technological, which is what is needed to generate steady-state growth.

Figure 3 illustrates this discussion in the context of the Solow growth model. Moving from point A to B is the effect of removing the set of all constraints which force θ below θ^* at any point in time. Moving from B to C is the combined effect of removing constraints while catching-up to a new steady-state which was generated by an innovation (either technological or institutional) which lifts $f_0(k)$ to $f_1(k)$. The dashed line represents the possibility that as we move from a point like A to C, the rate of ascent in y will produce year-to-year increases in y which may

lead one to deduce that r is larger than it really is because one has not taken into account the effect of moving from A to B (in others words, the effect of θ moving closer to θ^*).

3. Property Rights and Intensive Growth in China

If China's rapid growth has been due to one-time improvements in productivity that result from the removal of socialist constraints and/or one-time institutional innovations, then China's current growth rate will not be sustainable. Since θ is bounded by θ^*, to enjoy the prospect of continuing growth in steady-state, r must be greater than zero. In other words, China must implement technological or institutional innovations which increase total factor productivity in steady-state. This observation should come as no surprise to most China scholars--few believe the current rate of growth could be maintained *ad nauseam*. But the popular expectation that China will become an economic superpower in the 21st century is based on the implicit assumption that while growth may not continue to be as rapid as it is now, real output per capita in China will nevertheless asymptotically approach that of the developed world. This expectation is based on the implicit assumption that China's r is the same as the developed world. In this section we identify an aspect of the structure of property rights in China which casts doubt on the view that we should expect China's r to be as large as the r's of developed nations.

As was noted in the previous section, a steady arrival of technological and institutional innovations is what generates a positive r. In what follows we focus on how the structure of property rights in China likely reduces the rate at which new technologies are implemented, thereby reducing the value of r at the margin. We ignore the issue of institutional innovation and, by doing so, implicitly assume that China's rate of institutional innovation in steady-state is equal

to that of developed nations. While China is in the process of "catching-up" to the developed world it could be plausibly argued that China's rate of institutional innovation actually might exceed that of developed nations, but there is no reason to believe that this will also be true in steady-state. We believe our assumption that China's steady-state rate of institutional innovation is the same as that of developed nations to be a generous one.

The Decision to Invest in New Technology

The adoption of a technological innovation in any production process is ultimately the result of an investment decision. This decision is based on a simple cost-benefit analysis: if the expected increase in profits exceeds the expected costs, make the investment.[12] As a result, anything that either increases the costs or reduces the expected benefit of an investment decision will lower the likelihood any given investment will occur.

In China a substantial percentage of government revenues--at local, provincial and even the central government level--is generated by fees and taxes which are administered at the discretion of government officials. The discretion with which these revenues are collected can hardly be overstated (Powelson 1990; Oi 1995; Bowen and Rose 1996). An unintended but predictable effect of raising revenues in this manner--*kejuan zashui*--is that it invites government opportunism on the part of government officials.[13] Whether this opportunism is generated by a desire for personal gain or by legitimate government budgetary needs, the effect is still the same: *kejuan zashui* attenuates the residual claimant status of those who own productive assets in China. Put another way, the current state of property rights in China substantially reduces the value of residual claimant status by making the state the *de facto* residual claimant.

In China, it is a well-known fact of life that high profits invite a reappraisal of fee rates, tax rates and regulatory relief. It is for this reason, we believe, that Chinese family firms are so secretive, which is the comparative advantage that the family firm governance structure has over all other governance structures in China.[14] The problem is that the practice of *kejuan zashui* reduces the expected returns to investments, especially very high risk, high expected return investments, relative to the returns that would be expected in nations which collect their government revenues through explicit, non-discretionary taxes. Since the attenuation of residual claimant status that results from the practice of *kejuan zashui* effectively reduces the expected return of any investment decision, it should reduce the number of investments in new technology which are profitable at the margin. This reduces the number of investments in new technology in China relative to developed nations, where residual claimant status is a secure feature of property ownership. The presence of risk aversion on the part of the decision maker only makes matters worse. The more risky the project, the higher the decision threshold because the higher must the expected return be to be considered. Yet it is precisely the very high expected return investments that are most likely to attract attention and suffer from the practice of *kejuan zashui*, since government officials have a powerful incentive to cross-subsidize unprofitable state enterprises with the profits of highly profitable firms (whether private or state-owned).

How Firm Governance Structures and Government Bureaucracy Affect Investment Decisions

An important feature of anonymous, private legal corporations is their ability to raise large sums of low-cost, equity capital. Because of the ability to diversify ownership interests, such firms have effectively risk neutral principals whose only objective is the maximization of firm value. This singularity of purpose with its consequent effective risk neutrality on the part of

owners make the anonymous private legal corporation a governance structure that is most willing to make risky investments in new technologies. Yet because of *kejuan zashui*, not only are anonymous private legal corporations nonexistent in China, their emergence is probably impossible.[15] This implies that investment projects which would only have been undertaken in developed nations by anonymous, private legal corporations will not be undertaken in China. This is a very important point, for the investments which tend to raise total factor productivity the most in aggregate *ex post* are often those which, when the investment decision was actually made, appear the most risky.

High risk, high expected return investments in new technology have little upside risk but plenty of downside risk in China because government rent-seeking afforded by discretionary fees and taxation effectively truncate the maximum return a firm can enjoy on any investment. Only if the firm is forced by competition (in the sense that not making an investment will guarantee bankruptcy) will high risk, high expected return investments be made. But here again, discretionary application of regulations, fees and taxes affects such decisions by virtue of the fact that well connected firms almost never go bankrupt in China. This means that in China the risk of failing to invest in a new technology is low. On the other hand, since regulatory relief comes at the discretion of a government official, the ability to explain away poor performance *ex post* is important. As errors of omission are easier to explain than errors of commission, this further reduces the incentive to invest in a new technology which might dramatically increase profits but might dramatically reduce them, too. In developed nations with competitive market economies the story is just the opposite: firms that don't aggressively implement new technologies are left behind and may be forced into bankruptcy. The dominant strategy is to be the first firm to invest

in a new technology. Of course, when a new technology proves not to be productive enough to offset the cost of investment, some individual firms lose. But from the point of view of aggregate production, decisions which hurt individual firms while promoting investment in new technology might nevertheless improve total factor productivity. Aggressive risk taking might bankrupt some firms, but not every firm will go bankrupt *even if every firm gambles on the same innovation.* Some firms will survive and new technologies will never be passed over.

When the decision maker is the residual claimant or the agent of the residual claimant, the decision maker is induced to behave in a fundamentally entrepreneurial way. In the present context this means taking high risk, high expected return gambles on new technologies as they become available. In China, *kejuan zashui* attenuates residual claimant status thereby reducing the expected return from such investments. Moreover, discretionary regulatory relief tends to punish errors of omission less severely than errors of commission. Both reduce the rate at which new technology is implemented in China.

If China's steady-state rate of institutional innovation is no greater than that of developed nations, but its steady-state rate of technological innovation is lower, then after the one-time efficiency gains of the reform program stop generating growth China might begin to experience growth rates which are actually lower than the growth rates of mature, developed nations. Regardless of how large the base is, a lower r will inevitably lead China to once again experience a growing gap in living standards between its population and the populations of developed countries. As the Chinese reform program experiment has never been tried before, no one can predict how soon this will occur. What we do know is that if it happens sooner rather than later,

the gap between China and the developed world could begin growing well before China's population comes close to achieving the real incomes of the developed world.

4. The Evidence

To assess the usefulness of the taxonomy presented above we would like, in principle, to examine how rapidly China generates new, higher steady-states relative to the rest of the world. If it could be shown that China generates new, higher steady-state levels of real output per capita at a slower rate than that of developed nations, then we would have evidence which is consistent with the proposition that China's system of property rights will ultimately retard growth by marginally reducing the rate at which new technologies are implemented.

How fast China generates new, higher steady-states can be investigated indirectly by estimating how much of China's growth has been driven by increases in total factor productivity as measured by Solow residuals. This would give us an indication of how much of China's growth is intensive in nature. The taxonomy presented above makes clear, however, that one problem with this approach is that it cannot account for the effects of θ rising to approach θ^* as a result of the reform program. While the removal of socialist impediments might have in a meaningful sense dramatically increased total factor productivity, this is not a steady-state source of increases in total factor productivity. Another problem with this approach is that China likely experienced a series of dramatic, one-time institutional innovations after the reform period began because China's economy before central planning was essentially feudal. While these innovations were important and permanently increased China's real output per capita, it is unlikely that China could, in steady-state, implement such innovations at a greater rate than that of developed nations.

This is important, for if China's rate of institutional innovation is no greater than that of developed nations, a marginally lower rate of implementation of new technologies implies a lower steady-state rate of growth.

The preceding suggests that if one were to estimate Solow residuals for China and find that there were significant increases in total factor productivity in China's recent growth history, these increases should be treated as upper bound estimates at best. This is because the effects of θ rising to approach θ^* as well as the effects of one-time improvements in the institutional landscape would overstate the effect of true steady-state growth in the context of any econometric estimation. In a study of production in China, Chow (1993) actually finds no evidence of technological progress being a source of growth since 1952 and in some instances finds evidence of technological decline. Chow (1993) notes the significance of technological change in the study of China's growth history:

> Although technological progress defined in the context of Solow's [1956] growth model is an important phenomenon to explain for a market economy like the United States, one cannot presume its existence in a country like China during a period when private initiatives for innovations or adopting new technologies from abroad appeared to be absent. For such an economy one does not need to find explanations for the varying rates of productivity changes as Romer [1987] attempted to do for the United States. However, after the reforms in the 1980s when profit seeking enterprises began to grow, the study of technological progress in China is an important and interesting topic for further research.

In short, if one concedes that at least some of China's rapid growth has been driven by θ moving toward θ^* and the effect of catching-up to a new, higher steady-state which was generated from a one-time structural change in the institutional landscape, the absence of any evidence of increases in total factor productivity implies that China's r is very low indeed.

There are other forms of evidence which support the taxonomy advanced above. Lin (1988, 1990) found that growth in the agricultural sector was initially due to the "institutional innovation" of disbanding of communes and collectives and allowing farm households to make production decisions individually. While this did not take long to accomplish, growth continued in this sector through the late 1980s as a result of increases in variable inputs. This account is consistent with the idea of a dramatic, one-time institutional innovation engendering a subsequent period of extensive growth as the economy tries to catch-up to the new, higher steady-state.

In a study of the Open Door Policy and China's growth, Wei (1995) attributes China's growth during the late 1980s to the contribution of foreign investment and finds that the disproportionately high growth of coastal areas is entirely explained by exports and foreign investment. This account is consistent with the possibility that much of China's recent growth history has been dominated by Ricardian efficiency gains which resulted from the removal of constraints on foreign trade. In the taxonomy presented above, this has the effect of moving θ closer to θ^*, making r appear larger than it really is.

What of other East Asian economies such as Taiwan, South Korea, and Japan? Since Taiwan and South Korea are very small countries in the Ricardian sense, they treat output prices as exogenous. This allows for an avenue of growth which, given China's size, will not be pertinent to China as its economy grows. Indeed, analyses of the growth of Taiwan and South Korea have found that foreign trade was the main source of post-World War II growth (Chou 1995, Hsu 1995, Nam 1995). These two economies have done well over the past thirty years and have clearly made substantial headway toward development in their structure of factor allocation and in their integration into the international marketplace, but they are not models for China.

Japan's development history has been quite different. Research by Powelson (1990) on the long history of property rights development finds that Japan had a great deal in common with the development of Anglo-European traditions. Perhaps, as he argues, this promoted an effective tradition of private property rights. We do know that after World War II Japan was compelled under US occupation to adopt certain political and economic reforms and that the Korean War accelerated these reforms. As a result, Japan developed a statutory government which promoted the development of a system of secure property rights. This, we would argue, gave rise to an economy which rapidly implemented new technologies as they became available. It is a well-known hallmark of Japan's development history that it has aggressively implemented new technologies. Consistent with this propensity to invest in the *secure* expectation of future rewards is the fact that Japanese firms have also been at the forefront in developing creative, consumer-friendly adaptations for existing products. While Japan has obviously benefitted from export driven growth, it has also clearly benefitted from intensive growth which resulted from its firms aggressively implementing technological innovations and institutional innovations as they have become available.[16]

Hong Kong and Singapore's growth history is also instructive. In both citizens enjoy a high degree of personal and economic freedom as well as very secure private property rights, but little political freedom in the form of representative democracy. These governments are, as Milton Friedman puts it, "dictatorships, but benevolent dictatorships."[17] We find these to be interesting examples of the importance of secure property rights relative to personal political rights. The citizens of many countries enjoy a large measure of political freedom but less than secure property rights because of political pressures to redistribute income through the tax system

(e.g., Sweden and England). As a result, these countries do not enjoy the high, steady-state rates of economic growth of either Hong Kong or Singapore. Hong Kong and Singapore's success suggest that democracy might, for some countries, be an important mechanism to guarantee secure residual claimant status, but it is not a necessary condition. Whether the "benevolent dictator" model is applicable to China's steady-state growth problem is an issue to which we will return in the conclusion.

China's traditions are not antithetical to intensive growth *per se*. China enjoyed the highest rate of economic growth and the highest per capita income in the world during the seventh century (the *Tang* Dynasty, 618-907 AD) and during the tenth century (the *Song* Dynasty, 960-1279 AD) and perhaps even until the eighteenth century, when it was overtaken by England and Europe.[18] China's early lead and dominance was achieved due to the absolute advantage it enjoyed in the natural process of innovation based on random discoveries by its work force. This absolute advantage in intensive growth was conferred by China's size, its contiguous geography, and its relatively high degree of political, linguistic and cultural unity. If there is a natural rate at which innovations are randomly discovered and disseminated in the work force, then a larger work force will produce a larger absolute number of innovations. Thus China earned an early reputation as an advanced and inventive culture. China's later relative decline was not necessarily because China's rates of indigenous innovation and economic growth declined--they may not have--but more likely because England and Europe began to experience a new type of economic growth associated with the Renaissance and Industrial Revolution.[19] In those Anglo-European economies, the rise of the market economy and secure property rights made possible a higher rate of innovation and implementation of new technology than that which prevailed under feudalism.

Having never been transformed in this way, China's rate of implementation of new technology, whether indigenously generated or borrowed from abroad, is probably nonzero but nevertheless markedly lower than that of developed nations with market economies.

5. Conclusion

China's current political stability has been aided by its rapid rate of economic growth. Although per capita incomes in China are low relative to the developed world, most Chinese citizens have enjoyed a noticeable improvement in their standard of living over the last two decades. Most importantly, there has been a closing of the gap between their standard of living and that of the citizens of developed nations. But to continue closing this gap, it is not enough that China's steady-state rate of growth be positive. China's steady-state rate of growth must match or surpass that of developed nations, for a steady-state rate of growth which is lower than that of developed nations will ultimately lead China to experience an ever widening gap in living standards once the effects of one-time adjustments in real output brought about by the reform program have played out.

This paper has shown how high, observed year-to-year growth rates calculated *ex post* might mask the presence of a low, steady-state growth rate. We have argued that while China's reform program has clearly generated rapid extensive growth, it has done little to change the incentives that confront those who make the kinds of investment decisions which could engender intensive growth. The absence of secure residual claimant status, a direct consequence of *kejuan zashui*, continues to marginally reduce the rate at which new technologies are implemented in China. This, in turn, marginally reduces China's steady-state rate of growth. Existing anecdotal

evidence of China adopting new technology must be tempered by two observations. First, the adoption of 20 year-old technology may constitute a dramatic improvement in technology in China, but this does not demonstrate an ability to implement new technologies *as they become available*. Second, a high absolute rate of adoption of new technologies is not necessarily evidence of China adopting new technologies at the rate of developed nations.

Our taxonomy suggests that the Chinese people, who have been enjoying a narrowing gap in living standards over the last two decades, will eventually experience a widening gap in living standards--another growth crisis. But in the next growth crisis China will not be able to generate new growth by re-adopting reforms that are already in place as a result of the post 1978 reform period. China's next growth crisis will only be solved by China achieving a higher steady-state rate of growth which, in turn, will require China to eliminate those aspects of its system of property rights that lead to a systematic bias against investment in new technologies. In short, China must credibly guarantee the secure residual claimant status of its property owners.

We have argued that *kejuan zashui* and other discretionary aspects of government power is what attenuates residual claimant status. The solution to China's next growth crisis, then, is to remove the discretion with which the government imposes fees and taxes, and hands out favors in the form of regulatory relief. But the abdication of discretion is, in reality, no less than an abdication of control in favor of a statutory government. In the modern developed nations with market economies in Europe, the competitive pressures of Mercantilism selected for nations which adopted statutory governments, which led to the protection of the property right of residual claimancy. In Japan, a statutory government was externally imposed by the US. In China, however, there is nothing to force its leaders to relinquish control. China is a nuclear power with

the world's largest standing army. As a result, change can only come from within. Historically this has never generated the emergence of statutory governments which credibly guarantee secure property rights for their citizens. This has troubling implications for the formulation of US foreign policy. If China suffers a growth crisis because of its inability to generate intensive growth, its leaders may be tempted to look beyond its borders to generate extensive growth. This could destabilize the Asian continent, which has important foreign policy implications for Russia, Japan and, indeed, the rest of Asia as well. In particular, it suggests that the US should encourage Japan to re-arm in order to provide its own credible defense against a nuclear power. It also suggests that Russia's continued military capability is important for future stability of the Asian continent.

We do not reject out of hand the possibility that China's leaders could overcome its steady-state growth problem without giving-up control. Like Hong Kong and Singapore, China could, in principle, become a benevolent dictatorship which, while limiting political freedom, extends economic and personal freedoms. In this case at the margin investment incentives would change--risky new technologies would then be perceived as being capable of paying high expected after-fee/tax returns as leaders foreswear *kejuan zashui* and adopt truly statutory fees and taxes. This would engender intensive growth which may be sufficient to avert a future growth crisis. We are not optimistic that this will be a fruitful course for continued Chinese economic development. The reason why is China's unusual governance structure. China's central government has always possessed a high degree of military control but a low degree of institutional control over its population. The reform program has further decentralized government functions to the local and provincial level, which has led to a dramatic increase in the ratio of revenues collected at the local

and provincial level relative to those collected at the central government level. The practice of *kejuan zashui* is a ubiquitous feature Chinese governance, occurring with equal vigor at all levels. As a result, China's central government could foreswear *kejuan zashui* without significantly improving the security of residual claimant status of China's property owners. The central government would collect less money, the local and provincial governments would collect more, but incentives for investment in new technologies will remain unchanged.

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Endnotes

1. According to the China Statistical Almanac, China's real per capita GNP grew, on average, over 7% annually between 1980 and 1993.

2. Although an important development issue in its own right, we are not addressing the issue of whether a nation is capable of developing its own innovations. We believe Japan has demonstrated that a willingness to implement new technologies regardless of where they are developed is the key, not the ability to discover new technologies. We do not disagree that the ability to discover new technologies is itself a development margin which may grow in importance as more nations become capitalist. Japan's high rate of investment in research and development as well as basic research in universities suggests that it is aware of this possibility.

3. Put another way, in the Solow growth model economic growth does not occur by moving from inside the production feasibility set to the frontier of this set. Actual output is always equal to potential output for any given input vector.

4. Letting real output be given by the Cobb-Douglas production: $Y = AK^{\alpha}L^{(1-\alpha)}$, it can be shown that $\Delta Y/Y = \alpha(\Delta K/K) + (1-\alpha)(\Delta L/L) + \Delta A/A \implies \Delta A/A = \Delta Y/Y - \alpha(\Delta K/K) - (1-\alpha)(\Delta L/L)$. The term $\Delta A/A$, the Solow residual, captures the change in output that does not result from greater employment of L or K (Solow, 1957). Since A increases the marginal effect of increases in both L and K, A is often referred to as the total factor productivity measure. Any technological innovation which allows us to produce more output without more L or K affects the aggregate production function through A.

5. Note that our implicit assumption that s is fixed amounts to ignoring the "golden rule" issue. It will be clear later that none of our conclusions would be altered by doing the analysis in terms of golden rule savings rates.

6. See Grossman and Helpman (1993) for a review of this literature. Krueger (1995) and Srinivasan (1995) discuss endogenous growth theories in the context of East Asian growth.

7. Jensen and Meckling (1979) provide a firm-level explanation for how institutional innovations might raise productivity. They argue that an important aspect of the firm's production function is the structure of property rights and contracting rights within the firm. As a result, changes in the institutional landscape might enable firms to change the "internal rules of the game" in such a way as to increase productivity.

8. Such a change in θ could have occurred in the current period or an earlier period. In the latter case, changes in θ affect the base with a lag.

9. The central government has orchestrated campaigns to promote key sectors, such as the encouragement of foreign direct investment and the semi-liberalization of real estate services, to name but two. Other areas seem to have taken on a life of their own, such as the development of industrial and service production by Township and Village Enterprises (TVEs) under the direction

of local government authorities. For detailed discussion of specific reforms, see the annual economy issue of The China Quarterly.

10. This argument and variants of this argument have appeared in numerous places in the literature. For examples of this argument see Lin (1981), Cheung (1982) and Dernberger (1988).

11. One could argue that such a view lacks imagination. The emergence of derivative securities, for example, could hardly be characterized as a technological innovation and would not have been predicted by many a decade ago. But even if China enjoys a high rate of institutional innovations, its steady-state rate of institutional innovation would have to exceed that of the developed world to offset a lower technologically driven intensive growth rate.

12. If the decision maker is risk averse, the decision rule becomes this: if the certainty equivalent value of the expected profits of the investment exceeds the expected costs, make the investment. The presence of risk aversion on the part of the decision maker does not weaken the arguments that follow.

13. The Chinese term *kejuan zashui*--exorbitant levies and sundry fees--is familiar to Chinese in business and commerce. The key aspect of *kejuan zashui* is its discretionary nature. Indeed, in China such fees are often negotiable, which is quite contrary to conventional Western use of the word fee. The idea that such discretion would invite opportunism is hardly novel. This is simply an application of the well-known idea of rent-seeking, which was first popularized by Gordon Tullock. For a review of Tullock's work on rent-seeking as well as work by others in the public choice literature on this topic, see Mueller (1989).

14. Bowen and Rose (1996) advance the argument that true, anonymous, private legal corporations do not exist in China because the practice of *kejuan zashui* makes the payment of corporate profits through dividends impossible. Weidenbaum and Hughes (1996) demonstrate the importance of family in economic success in China as well as for expatriate Chinese.

15. This argument is advanced in Bowen and Rose (1996). This paper addresses a question raised by William Kirby (1995). In the context of an historical treatment of the evolution of China's Company Law, Kirby documented the absence of what he referred to as "anonymous, private legal corporations based on the Western model" in China.

16. It is well-known that Japanese firms have been quick to institute new management techniques and philosophies, many of which originated in the US. This is an example of the implementation of institutional, rather than technological, innovations.

17. This quote was taken from a speech given by Friedman at Claremont-McKenna College in May, 1996.

18. See Powelson (1990).

19. So why did China, with its early lead, fail to experience its own industrial revolution before the Anglo-European economies? This is the so-called Needham Puzzle (Needham 1965, 1986). We believe this may also be related to the absence of secure property rights, a thesis which we are currently developing in another paper.

FIGURE 1

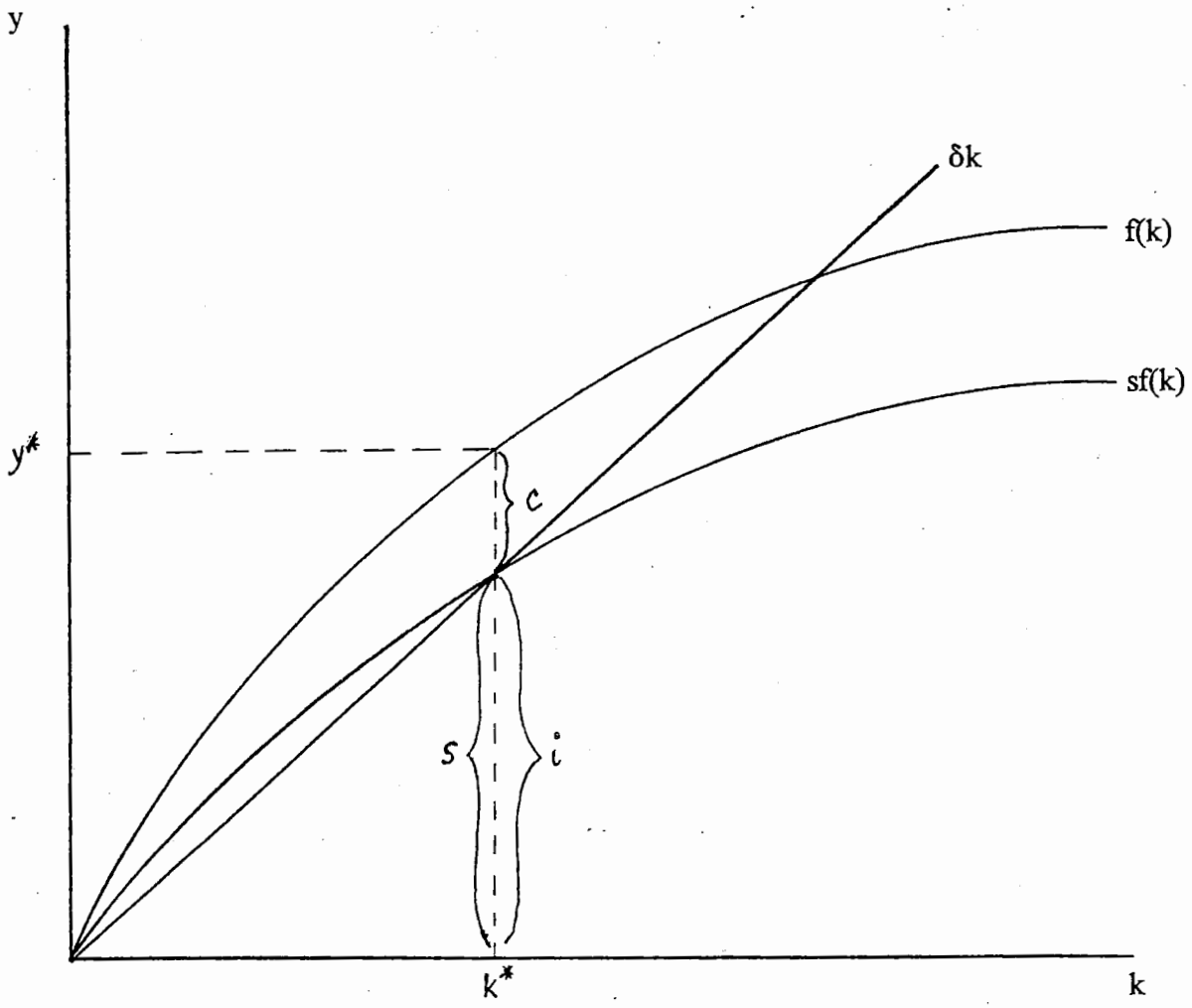

FIGURE 2

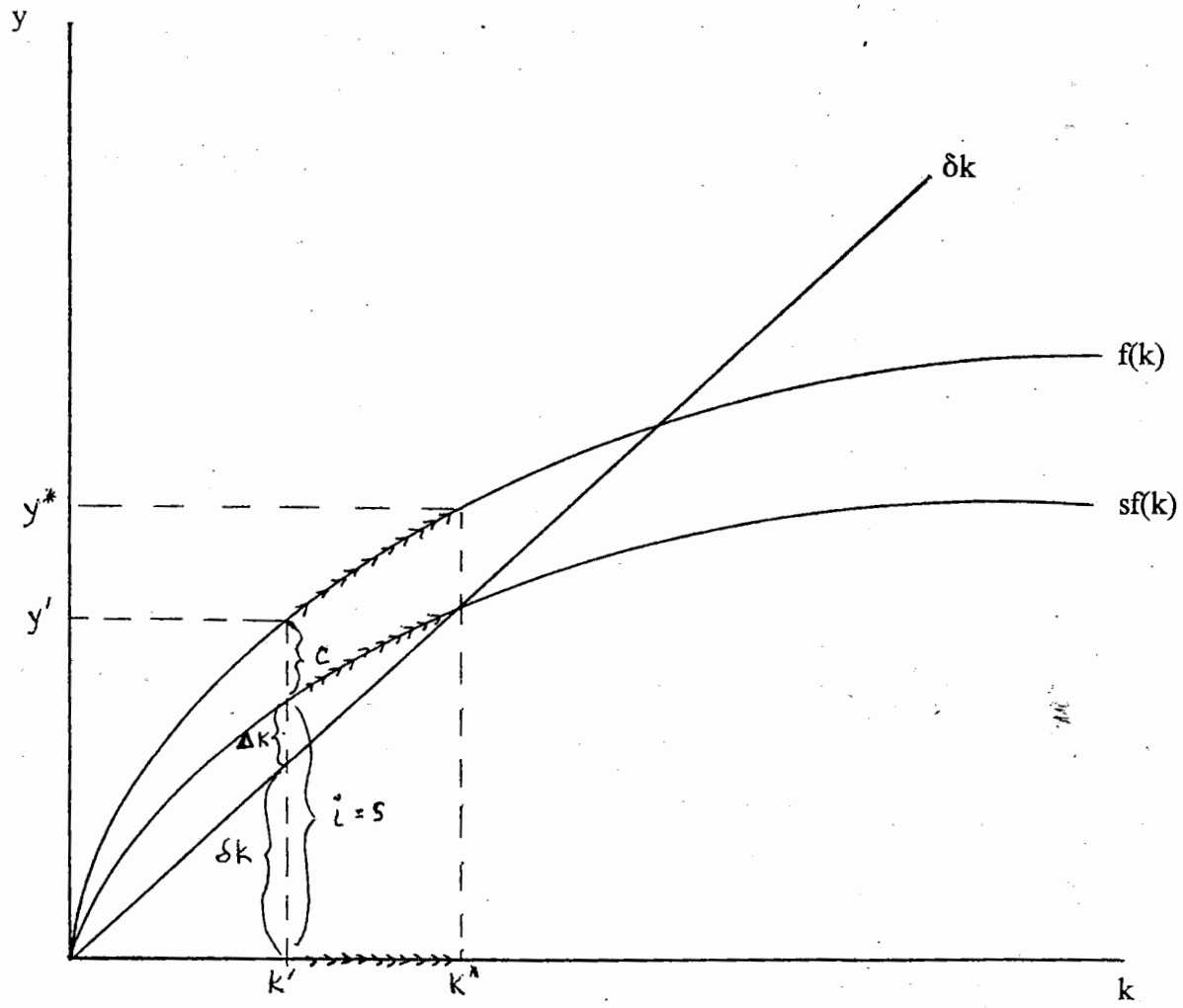

FIGURE 3