

**The Internet and China:  
Strategic Implications  
For China and the West**

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## **1. Introduction**

The Internet has been touted as an enabler of development, especially in countries with a large backward rural population. Recently, the 2 major countries with Internet potential have indicated plans for rural involvement. India is planning a widespread introduction of an inexpensive “simputer” that combines PC capabilities with a pocket PC design.

More profoundly, it appears that China is considering a massive infrastructure investment that will provide some form of high speed internet access to 900 million rural Chinese. The scope of this undertaking will rival that of the Three Gorges Dam project and its social ramifications may exceed those of the Three Gorges Dam. While the specifics of creating this infrastructure are complex enough, the implications of this strategy for Chinese economic development, for internal political change, as well as for Western countries, all are potentially revolutionary. Imagine a rural population with much improved real-time access to medical care, crop fertilization and irrigation advice, ability to take advantage of distributed education (distance learning), and with the training and access that will be needed to participate in more modern industrial and post-industrial labor markets.

Consider the implications for Chinese governance. Can the center control information flow so that the rural population supports central initiatives, or will the open structure of the Internet destabilize central government authority? As we now observe, the Chinese government is quite aggressive in limiting open Internet access, using the latest control devices. How will the Red Army position itself as an owner of privatized companies and as a political force? Will internal demand for consumer goods expand beyond the government’s ability to provide those goods, or will increased production further drive down the Chinese cost of production, challenging Western companies to match costs, quality, and other benefits resulting from the scale of Chinese domestic markets?

Such a Chinese rural Internet initiative will be the largest social experiment in the history of human civilization. Everything, from the position of women to generational conflict to social values to economic growth to governance, will be drastically shaken up. Rural familial authority can be challenged by a younger generation empowered by new information and higher earning power. Women can become more influential as Internet networks cater to their needs and concerns. Young adults can more easily move to towns and cities. And, of course, demand for consumer goods will skyrocket.

The magnitude of bringing 900 million rural Chinese online does not allow for straightforward prediction or anticipation of outcomes; even the Three Rivers Gorges project seems to have led to unanticipated social protests. There are simply too many variables interacting in too many alternate paths. There is a technique, scenario planning, that is appropriate for evaluating extreme uncertainty, especially in an “emergent” context where small initial differences can subsequently have enormous consequences. We will explore various scenarios for this Chinese Internet initiative as a way to think through the range of outcomes that might emerge as the grand experiment proceeds.

## 2. The Scenario Process

### 2.1. The Role of Scenario Analysis

Scenario analysis is a tool used to deal with strategic uncertainty, when the environment is undergoing rapid and unexpected change, and when the future does not appear to be predictable through simple extrapolation of historical trends applied to the current environment. Scenario analysis does not attempt to predict the future, or to identify one single future. Rather, it identifies several futures that are worthy of further study, futures with high impact, and futures that are characterized by new threats and high risk or by high reward.

Instead of predicting a single future, we identify, prepare for, and practice our actions in several plausible (rather than probable) futures. In training, an airline pilot will practice losing the right engine, or losing half the tail fin, not as a prediction for a problem that he expects that he **will** encounter, but as preparation for a critical future that he **might** encounter. We call this kind of preparation *remembering the future*; if the pilot has practiced and prepared then he is likely to enjoy *rapid recognition* if the problem should arise when he is in command, and he is likely to exhibit *rapid response*, successfully avoiding disaster by applying the necessary in-flight corrections.

Scenarios have been used similarly in other areas. They were important in the transition to a multi-ethnic government in South Africa. They have been developed to describe futures in intractable domestic political situations like Columbia or Quebec. They continue to be used extensively by the US DOD and CIA.

Scenario analysis is also used by groups representing entire industries or by individual firms, and by groups as diverse as national security agencies, non-profits and charities, or high tech businesses.

### 2.2. The Method of Scenario Analysis

Scenario analysis starts by deriving a set of strategic uncertainties, things that are both **highly uncertain** and **highly significant**. These are things that we just cannot know no matter how much research or many experts examine outcomes (they are fundamentally uncertain); they are precisely what traditional planning either ignores or forces into a single data point. A small subset of these uncertainties will be selected as **strategic drivers** of our scenarios; that is, as the factors that will determine our futures. The values taken on by those uncertainties determine a set of scenarios and the conditions that generate them.

Once we have defined our scenarios, we assume in sequence that each one will be the one true future, and we see what the world would look like if this were indeed our future prediction. Then we plan and practice and prepare for it, just in case, and just as we would if we were indeed certain that it was the correct basis for our strategic planning. That is, we test out different strategies and game different

responses, so that if and when the scenario actually folds we know what to do and how to do it most effectively.

### **3. Introduction to Our Scenarios**

#### **3.1. The Strategic Drivers**

We began our study by agreeing that the object of our scenarios would be to anticipate the directions that rural China might take, in response to widespread Internet access, with the intent of providing insight that would be useful to business executives and political leaders both in China and in the West. These were our starting questions:

- What will Chinese objectives be for the project?
- What metrics will be used to determine if the project ultimately has been successful, and more importantly, what metrics will be available during its roll-out to determine if it is proceeding acceptably towards success?
- Most strategically for Chinese project leadership, if early indicators suggest that success is not yet assured, what controls will be available to the leadership of the project to redirect it and to assure ultimate success?
- And, perhaps most importantly for Western business and political leaders, what would the implications be for Western economies and for Western industries?

We knew we would be unable to provide definitive answers to these questions at this time, just as we knew that we are presently unable to predict what the outcome would be. We decided that we would need to provide a *range of predictions* — sort of like performing sensitivity analysis for social engineering problems — and we sought to assure that our work would at least provide the insight needed to answer these questions.

Discussions with colleagues knowledgeable in matters Chinese, Internet technology, and rural sociology suggest that the objectives of the Chinese leadership for the project include some combination of the following:

- Universal access to real-time coverage of the 2008 Beijing Olympic Games, and the prestige that these Games will confer upon the city and the nation.
- More widespread access to information relevant to the lives of the rural population, concerning everything from the safe handling and effective use of agricultural chemicals, fertilizers, and pesticides to telemedicine and health care.

- Distance learning and training in professions of greatest value in an information economy, supporting an economic transformation such as that experienced by the offshore software development, data entry, and call center industries emerging in India.
- Greater opportunities for women in rural China. Women exercise significant control within the rural Chinese family, and Internet access can provide them with links to other women and women's groups, broadening and deepening the scope of their influence.
- Tighter integration of the rural hinterland into the economic, political, and social structures of China, alleviating some of the gap between South Coastal China and the rural hinterlands.

We first examined the uncertainties underlying these questions. Some uncertainty comes from our inability to predict how effective the net can be as an agent of rapid social and economic integration. Equally important, uncertainty surrounds how rapidly the project will proceed or will be allowed to proceed. Winnowing down these kinds of uncertainties, we selected the following two as the key **strategic drivers** of our Chinese Internet scenarios:

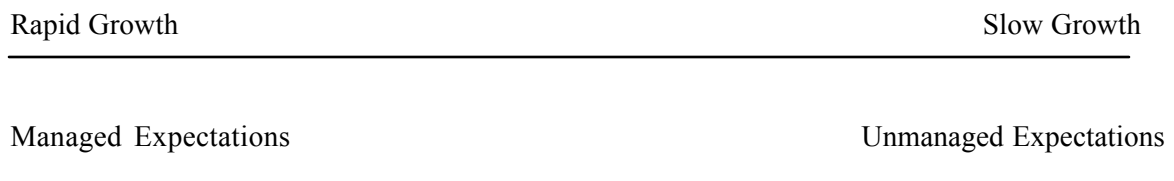
- **Management of Expectations** — How effectively will the Chinese leadership manage expectations for the project. **If the large rural population has reasonable expectations — that the net will improve access to information and improve education and awareness of health issues, they are more likely to use the Internet within the boundaries of acceptable use and are more likely to achieve the benefits that they expect.** If the population expects to be rapidly or immediately integrated into a high tech economy both as productive knowledge workers and as affluent consumers — with the massive rural Chinese hinterland immediately emerging as a new Shanghai, Hong Kong, or Taiwan — then popular expectations will certainly not be met and large-scale frustration can be anticipated.
- **Speed of Implementation and Adoption** — Rural usage of the net may be high, consistent with the Chinese leadership's expectations and intentions. If the implementation of the project proceeds rapidly, if the population is able to use the technology as intended, and if the content available is of sufficient general interest, then there will be large-scale usage. Literacy is widespread enough among younger rural Chinese so that they can either use a text interface now or will be able to do so soon.

Alternatively, if technical snags delay implementation, if training or interface design issues limit usability, or if other factors such as tight control and monitoring of usage limit access, then adoption and net usage may initially be much lower than anticipated, with more frustration especially among youth. Likewise, there may be social, non-

technical issues that could lead Chinese authorities to delay implementation. Almost all rural societies (Indian and Chinese especially) experience tensions as younger generations become more aware of urban and global cultural influences. These can be exacerbated by the Internet as a conduit for cultural trends and fads appealing to youth, but not necessarily to their parents. Using broadband access for Chinese government and Communist Party purposes can quickly clash with pressures to discover and emulate foreign youth. If the initial response to net usage should in some sense be unsettling or destabilizing, for example, creating economic demand that cannot initially be satisfied or creating strong divisions between young and old or other segments of the rural population, then the leadership might choose to delay or to defer installation of some capabilities or in other ways slow down implementation and adoption, raising the question of putting the genie back in the bottle.

Our selection of these uncertainties is not intended to prejudge either the likelihood of encountering problems during implementation of the project or the ability of Chinese leadership to resolve them effectively. Rather, consistent with the method of scenario analysis, the selection of these uncertainties is merely intended to indicate that they are very **important**, in that they will determine the degree of success achieved, and that they are indeed still **uncertain**: we really do not know (and cannot know) how they will play out.

These uncertainties can be arrayed along 2 axes:



### 3.2. The Scenarios

The combination of rapid growth and adoption of the Internet in rural China or low growth and adoption, along with successfully managed expectations or unmanaged expectations, yields four possible extreme scenarios for the future of rural Chinese Internet access.

Filling in the quadrants derived from these axes, we find these scenarios:

- **Enlightened Growth** — This scenario is characterized by rapid completion of the Internet project and widespread adoption by the rural Chinese population. As important as the scale of implementation and adoption are the results, which in this scenario match the intentions of the Chinese government. Education, health, political and social integration, and economic opportunity all improve as a direct result. This is a *green light scenario*; full speed ahead! From a Chinese perspective, the principal strategic

recommendations here would be to do nothing to interfere with the scenario and to be certain to exploit the opportunities created for improving agricultural output, increasing the skilled labor pool, advancing women's health, lowering production costs through increasing the amount of production to meet rural desires, etc.

- **Triumph of Inertia** - this scenario is characterized by limited impact along with constrained expectations among potential users. Nothing much happens, although publicity indicates otherwise. Adoption is slow because of lack of interest among potential users, or because installation and roll-out are delayed. No immediate harm is done other than the wasted investment and the lost opportunity, but the longer-term danger is increasing disaffection of the rural population. This is a *cautionary yellow light scenario*. The principal strategic recommendation for the Chinese government is to get the project back on track.
- **Put on the Brakes** - this scenario is characterized by expectations that quickly exceed and overwhelm what can be actually delivered. Strong demand is created — for health care, for consumer goods, for employment opportunity, or for democratic reform — but lack of discretionary income or available goods limit satisfaction. Frustration and alienation increase among rural residents, precisely the opposite of the anticipated integration and increase in welfare. This is another *cautionary yellow light scenario*. Our expectation is that the leadership might attempt to *put on the brakes* and restore rural society to the *status quo ante* or, more plausibly, to delay and to redirect development of the project. This may or may not be feasible, once desires have been created and encouraged. Our principal recommendation therefore would be to manage expectations from the outset and to assure an orderly progression to the **Enlightened Growth** scenario.
- **Chaos!** – this scenario is characterized by rapid and successful implementation with widespread use of the net by rural Chinese, leading to unmanaged and unmanageable expectations among these users. Once again, demand is created — for health care, for consumer goods, for employment opportunity, or for democratic reform — that far exceeds what can or what will be delivered to the rural population. Older rural peasants and agricultural workers are alienated because they have the wrong skills and training to participate in the new, high tech economy. Younger rural workers are frustrated because they earn less than their colleagues in the city, because educational and employment opportunities are more limited than they felt had been promised, or simply because the goods and services they want are not yet available in sufficient quantities or at affordable prices. Moreover, the net gives this increasingly disaffected population a voice, a way to communicate and a way to organize. We note that this is a *red alert scenario*; 900 million disaffected citizens cannot be ignored. Our principal recommendations include understanding the leading indicators so that this scenario can be anticipated and averted, perhaps by an early and temporary entry into the **Put on the Brakes** scenario, or

perhaps by matching the speed of introduction to the speed with which the economy can absorb new tech workers and provide them with the goods and services they will come to expect.

Each scenario represents a hypothetical, possible future; the paragraphs above describe what would happen if the scenario occurred, not what will happen in some inevitable future. The four scenarios are arrayed graphically in figure 1 below. The following four sections treat each scenario in more detail.

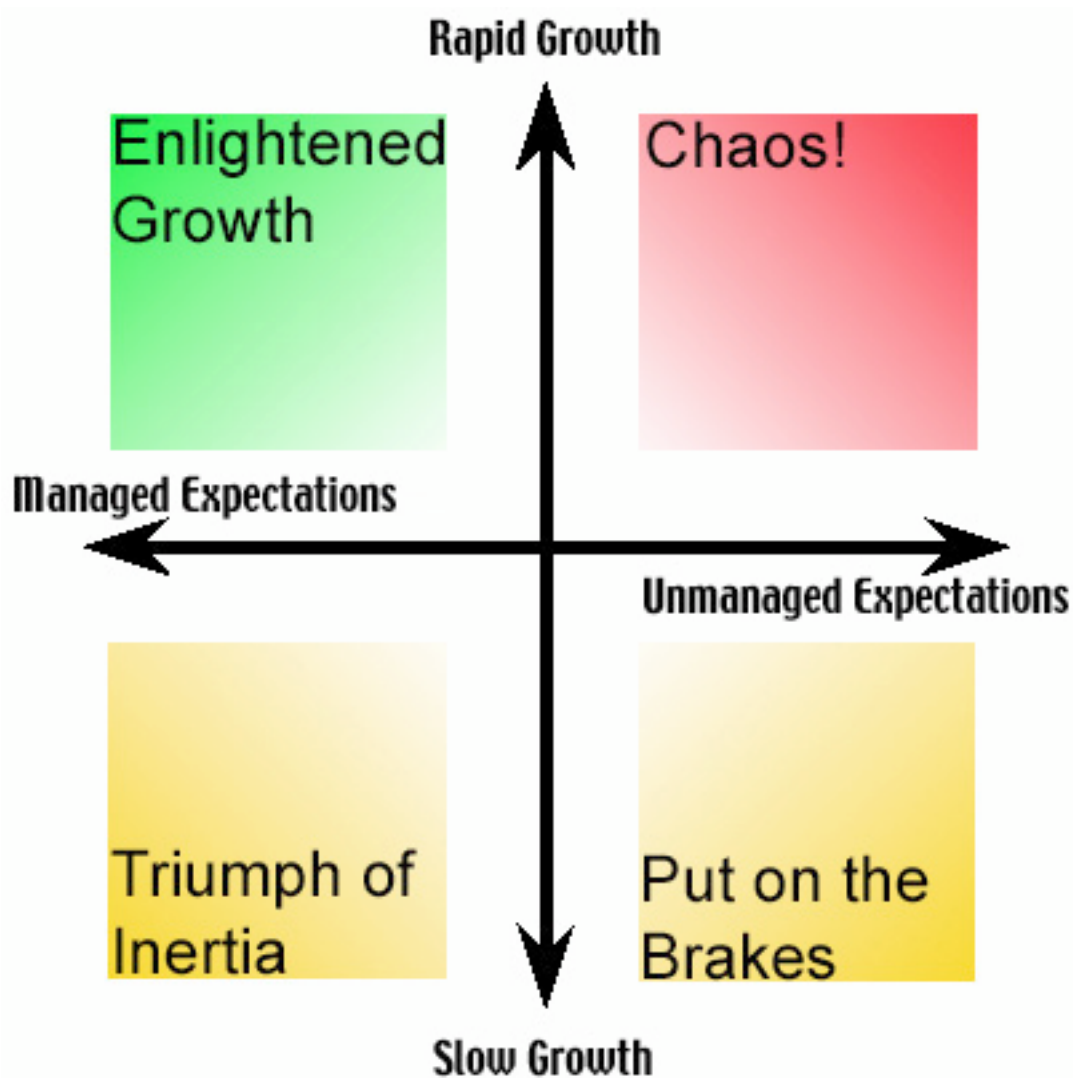


Figure 1.—Four scenarios for the growth and development of the Internet in China, from the perspective of a Chinese observer.

## **4. Enlightened Growth**

### **4.1. Implications for China**

This, of course, is the scenario that the Chinese leadership would hope to achieve through rural connectivity. The benefits for the Chinese are clear:

- With the addition of several hundred million new workers, the Chinese economy would become more productive and more efficient (further reducing consumer prices, which in turn allows more Chinese consumption as well as expanding foreign markets).
- One of the principal factors limiting farming productivity in China is the large number of rural workers available for agricultural labor, limiting the application of automation and the most advanced farming technologies. With the development of non-farming economic opportunities for this population, either in rural China or the cities, the number of Chinese agricultural workers declines, forcing mechanization and paradoxically increasing agricultural yield.
- The resulting productivity gains, both in agriculture and non-agricultural sectors, would significantly increase the size of domestic Chinese markets, both for consumer goods and for the industrial equipment needed by companies that produce those goods.
- With the production of the advanced technology electronics needed for the implementation of the project, at least some of which would be manufactured locally, China would immediately(?) become a major producer of state-of-the-art high technology products for export.
- With the production of the technology needed for the implementation of the project, China could well be positioned not only as a major competitor for high technology products in advanced countries but also as the leading producer of these products for emerging markets.
- For the intermediate term, with China more fully linked to the world's information sources, the Chinese population would be better informed and more able to communicate, leading to a more engaged and questioning democracy. This may be overly optimistic for the short term, however, depending on government control of access and of content.

### **4.2. Implications for the West**

This future can easily be misunderstood by the West, and over the long term it may be the most economically dangerous for Western economies. An initial examination of the scenario suggests the tradeoffs: While the West would have gained a new market for its products, especially its "style-goods," it would also be confronted by a major new competitor. Further examination is even less encouraging:

- It is not clear how large the market for Western goods in the post-development-project China would actually be. Many of the manufactured goods purchased by Western economies, from consumer goods such as textiles and footwear to industrial products such as electrical components and steel, are actually manufactured in China. The incentive from the Chinese side will surely be to expand internal capacity to meet increasing domestic demand, rather than increasing imports of these goods from the West.
- Moreover, it is not clear how large the Chinese market for Western style-goods would be. Many Western style-goods, from expensive silk ties to designer jeans, are already made in China, and increased local Chinese production for local Chinese consumption need not imply an economic windfall for Western firms. With major determinants of taste and style — Chinese language film, television, and entertainment production — likely to remain outside the US, the style-goods demanded by the emerging Chinese middle class may well be of local design as well as local production, and thus may provide little or no economic benefit to the West.
- In fact, such an increase could reduce the costs of manufacture in China due to increased experience and increased scale of operations; this could make China even more successful in the West as a seller and as a competitor, rather than as a customer.

While a newly invigorated China may not be a large market for Western goods, it is likely to be a large and effective competitor for Western industry:

- In a wide range of industries, from manufactured commodity products like steel to high tech electronics like telephone central office switches, China is emerging as a competitor, more effective than anticipated, and certainly much sooner than anticipated. It was once common wisdom that the market for central office switching would be dominated by one or two North American players (AT&T/Lucent and Nortel), a European manufacturer (perhaps Siemens or Ericsson), and a Japanese producer; however, it now appears that Shanghai is effectively challenging both North American switch manufacturing competitors. The most rapidly growing market for basic telephony at present is in China, which in part is powering the emergence of Chinese switch production. With its huge domestic market poised to power growth, other industries such as automobile manufacture may soon emerge (as the recent announcement of a major joint venture with Toyota suggests), as occurred in Japan in the 1960s. Moreover, these Chinese industries may quickly move onto the world stage, as their Japanese counterparts did in the 1970s. Western producers would be left behind, in part because of their older industrial technology, in part because smaller markets for the sale of their goods left them with reduced incentives and reduced ability to invest
- A rapid increase in productivity of Chinese agriculture is likewise potentially threatening to the West. It has been quipped that the US does not need to produce high-end

photographic equipment (like Nikon or Hasselblad) or high-performance luxury cars BMW 740s or Infiniti Q45s, as long as we can *grow* them in Iowa and Kansas; the argument is that US agricultural trade surpluses fund the purchase of automobiles and cameras from Germany and Japan. However, a dramatic increase in Chinese agricultural productivity might simultaneously reduce the sale of US crops to China, increase competition for the sale of these crops elsewhere, and decrease the world price for many agricultural products. The Western ability to *grow* products that it did not produce would be significantly diminished.

## **5. Triumph of Inertia**

### **5.1. Implications for China**

In this scenario relatively little happens. The implications for China include:

- Lost opportunity - China will take longer to integrate its rural workers into its economy and society, with the clear implication that their productivity will not grow as rapidly. Sluggish implementation also can derail the project as new issues arise and demand resources.

### **5.2. Implications for the West**

Again, since development is constrained, the implications for the West are limited:

- The size of the Chinese market for Western products and services will continue to grow at approximately the present rate since there is little change in among the rural Chinese population in either their awareness of these goods or their ability to pay for them.
- Full Western-style democracy will grow at best slowly, if only because the information needed both to drive demand for it and enable it to function may not yet be available.

## **6. Put on the Brakes**

### **6.1. Implications for China**

This scenario has much in common with **Triumph of Inertia**. The principal difference in **Put on the Brakes** is that the population enthusiastically embraces the technology but in ways the Chinese leadership has not anticipated and so the government makes the deliberate decision to delay or the halt implementation. In addition to the implications for the **Inertia** scenario, there are other, perhaps more disturbing, possibilities:

- Demand has been created for goods and services that are not yet available in sufficient quantity in the Chinese market, or they are unaffordable for a large number of rural Chinese who have been made aware of these goods and who now desire them.

- Demand has been created among the population that has had access to the Internet for information that is not being made available, or the leadership is losing the ability to restrict access to information.
- Frustration levels and political unrest may increase as expectations are raised but not fulfilled, precisely the opposite of government hopes of dampening alienation among the rural population.

## 6.2. Implications for the West

Many of the implications for the West are the same as in the **Inertia** scenario. However, since the Chinese leadership may find it impossible to return to the *status quo ante*, this scenario is different from, and probably less stable, than the **Inertia** scenario, with a higher degree of political risk.

## 7. Chaos!

### 7.1. Implications for China

The decisive difference between **Chaos!** and the other scenarios is that the **Chaos!** scenario is profoundly destabilizing:

- Demand would increase for goods that would not yet be available, or would not yet be available at a price that rural workers could afford.<sup>1</sup>
- The economic and social differences between young and old might also be destabilizing if the young were better suited for a net-based economy, earned more, and demanded untraditional roles in their local communities, economies and governments.
- Demand for services would increase before personnel were available to provide them. This would be most pronounced in health and in education, if bureaucracy interferes with the smooth development and functioning of the service sector.
- At the same time this frustration would be straining rural society, new information sources on life elsewhere, and new mechanisms for activism, would be enabled by the net.

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<sup>1</sup> While this point may appear to be a significant and highly probably outcome, its risk may in fact be very small. China's economy has the ability to manufacture large volumes of inexpensive consumer goods, and has historically employed a multi-tiered pricing system domestically. Large urban markets have access to the goods first, at highest prices; the goods filter through the economy, from large urban areas to smaller cities, then to towns, and finally to rural communities. As goods move from urban consumers to consumers in the countryside, the selling price progressively decreases. This suggests that an increase in the size of the economy would not result in rural demand that exceeds ability to pay, if rural prices continue to be subsidized by urban prices.

Of course, if goods are offered to rural consumers over the net, it would be difficult to continue the practice of charging full prices to urban purchasers, who would no doubt choose to purchase at web prices.

It is not immediately clear how deeply rural unrest may affect the rest of China or what actions would be taken to quell it.

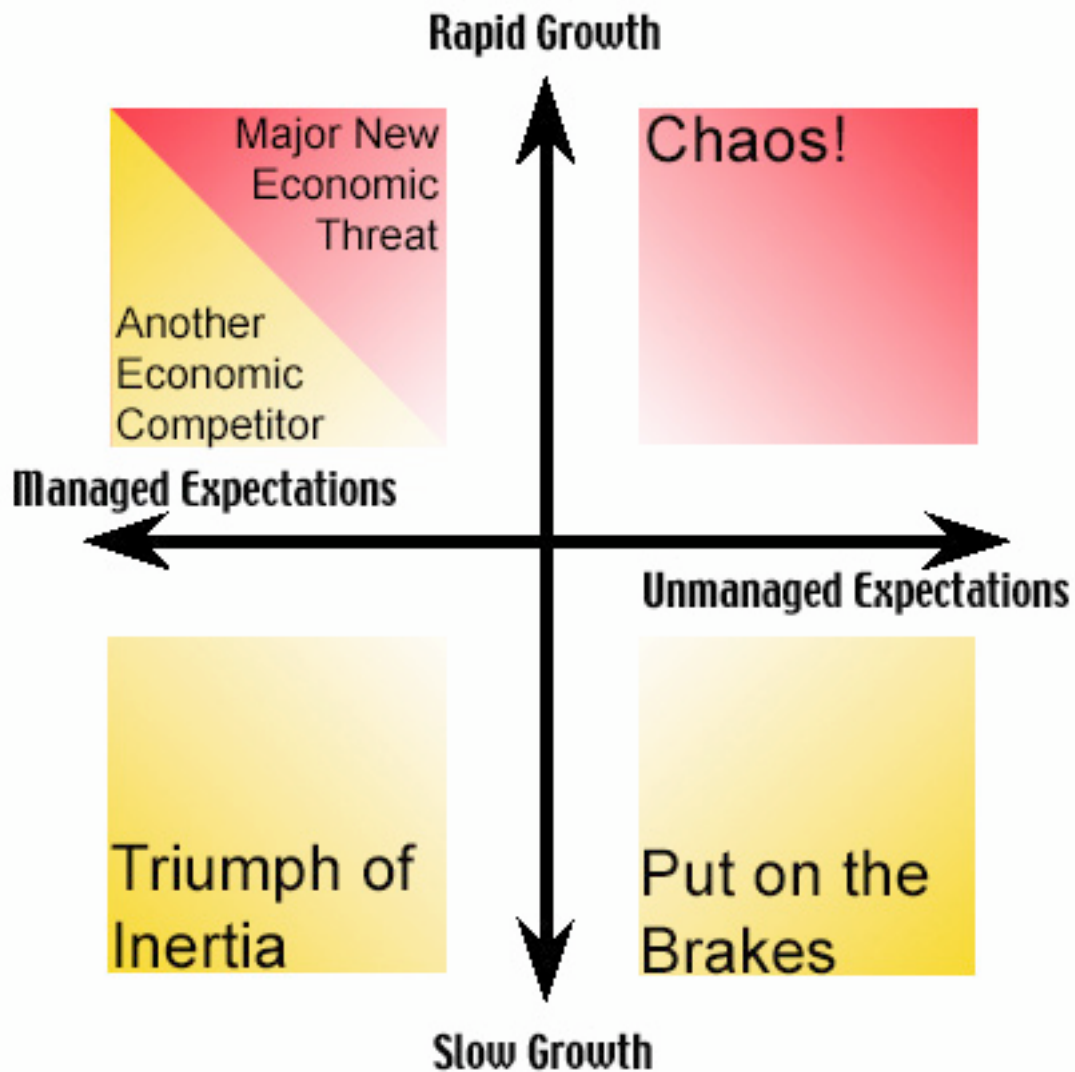
## 7.2. Implications for the West

Clearly, unrest in a major nuclear power cannot be good for the West. Less dramatic, however, but equally important would be the size of the humanitarian aid problem that might be created if unrest in China's rural population led to temporary food shortages in the world's most populous nation.

## 8. A Call for Action in the West?

A review of the implications of the four scenarios for the West suggests that the two associated with limited adoption and growth of usage — **Triumph of Inertia** and **Slow Growth** — require only moderate caution among Western business and political leaders, since little occurs that represents a direct challenge. The **Chaos** scenario obviously demands study. But the **Enlightened Growth** scenario may have very different implications for the West than it does for China; under this scenario China may at best represent no more than another economic competitor, while at worst (from the perspective of Western observers) China may represent a major new economic threat, much as Japan did beginning in the 1970s. Moreover, the West may be no more prepared for the economic threat that China represents than it was for the threat from Japan, and no more willing to take the threat seriously than it was when small, poorly-made Japanese cars first began to appear on American roads.

It is clear that there is no *green light scenario* from a Western perspective, and no easy economic opportunity presented by any of these four scenarios. It is equally clear that the **Enlightened Growth** scenario, far from being a green light economic opportunity for the West, represents either yet another economic competitor, assuming that appropriate economic responses are taken in the West, or a major new economic threat, if no responses are forthcoming in a timely fashion.



**Figure 2.—Four scenarios for the growth and development of the Internet in China, from the perspective of a Western observer considering the impacts on Western economies.**

It would be easy to conclude that there is danger in only one of the four scenarios and that the emergence of this scenario is uncertain, and hence it would be easy to delay any economic or political response. It would be even easier to conclude that Western economic superiority will predominate, especially since the complexity of managing a social, engineering, political, and economic transformation of this magnitude exceeds anything that the Chinese leadership, or indeed any other government, has ever attempted to manage before. However, we believe that automatically betting in favor of Western technologies and betting against the Chinese leadership, while taking no defensive action to prepare Western industries to face emerging Chinese competitors, would be a grave and irresponsible mistake.

- It is easy to envision the Chinese information infrastructure having a clear progression, beginning with television and entertainment, adding sources of information that would improve the quality of rural life, and then incorporating distance learning, adding value at each step.
- It is easy to develop a feasible technology plan, based on a fiber backbone that parallels railroad rights of way and wideband wireless (as LANs around stations) for the final mile.
- It is easy to imagine an implementation plan that begins with local “net access centers” in meeting spaces in towns and collective farms, before providing net access to each individual family’s housing. This would have numerous advantages. Technology costs would be limited while still rapidly providing some access to all parts of the country. Usage would not be untrammelled and “undisciplined,” which if allowed could lead to unmanageable expectations. The best individual performers in distance learning at these access centers could be selected for further training, much as national sports teams function at present.

While this may not sound like universal Internet access, in the way that the Electronic Frontier Foundation or Internet pioneers would envision it, it is a safe, feasible plan that could well support movement towards **Enlightened Growth**. Moreover, as the only major country still dominated by a Communist Party, it is clear that Chinese leadership has been effective in understanding local expectations and in managing these expectations while producing increasing living standards and maintaining at least some degree of local support. It would be reasonable to assume that this experience would be invaluable in managing the rollout of the Internet infrastructure project.

## **9. Conclusions and Action Implications**

### **9.1. Conclusions**

Our conclusions can be simply stated:

- Assuming a huge attempt is undertaken to connect the countryside via the Internet, the future impact of this effort upon China’s rural population is uncertain and rural net utilization could be either stabilizing or destabilizing for the current regime. Very different scenarios could emerge.
- If the Chinese leadership achieves its objectives, the implications of internet technology could result in a stronger China, although success will have mixed implications for the rest of the world. The West may have a new large market for its goods and services, but may face a new economic powerhouse as a competitor.
- Alternatively, if the Chinese leadership succeeds in creating a rural population with high expectations, but with expectations that cannot be met in a timely fashion, the results can be explosive, politically and culturally.

Interestingly, both the alarming red scenario (**Chaos!**) and the encouraging green scenario (**Enlightened Growth**) share the same high degree of implementation and usage. It is the readiness of the rest of the economy, the nature of usage, and the differences in value received by different groups of rural workers (by educated or less-educated workers, or by young or older workers, or by men or women, for example) that determine the outcome.

The same four scenarios may appear very different to an observer planning for Western industries or concerned about the strength of Western economies. The scenario that results in the greatest growth of Chinese industry and Chinese agriculture — the *green light scenario* for the Chinese economy — may represent the gravest threat faced by Western economies.

## 9.2. Action Implications

Paradoxically, effective Western actions include both helping Chinese leadership manage a smooth and effective transition to an information-based economy as well as preparing the West to deal with this sea-change effectively. Clearly the West, as well as China's citizens, will be better off if China takes its place as a strong and stable member of the emerging post-industrial economy. Just as importantly, a newly fully modernized China, with competitive industries in everything from consumer textiles to telecommunications, computing electronics, and steel will represent more than a captive market for Western goods; it will be a significant economic competitor.

A deep understanding of the scope of this project from the Chinese perspective includes determining the metrics that indicate which scenario is emerging (“early warning signs”) and the control mechanisms available to the Chinese leadership. Since both the extreme scenarios (**Chaos!** and **Growth**) are characterized by the same high degree of implementation and adoption, the obvious metrics of installation and utilization are unsuited for determining which scenario will emerge. Other measures will be more subtle, and will be tied to desired objectives and to degrees of satisfaction and well-being experienced by the intended users among the rural population. The Chinese leadership has time to determine these metrics, take base-line readings before implementation of the project begins, and prepare for longitudinal studies as the project unfolds. This is especially important as the magnitude of the effort leads to inevitably to unpredicted, self-reinforcing trends and self-organizing “emergent” behavior, as described by recent work in complexity theory. This means that the progress of the Chinese rural population from one decade to the next cannot be anticipated by referring to current conditions, any more than the European dominance of the Spanish in the 1500s could have been predicted from conditions 300 years early, or the subsequent dominance of the British Empire three centuries later could have been predicted from conditions in the 1500s.

As importantly, responding from the Western perspective includes understanding which industries the Chinese are likely to dominate no matter what the West might do (due to the scale of the emerging Chinese market) and which industries the West can and must preserve through adequate investment,

R&D, education, or other forms of advance preparation. The impending linking of China's peasantry to modern communications and information will have far-reaching consequences for the West that go to the heart of global political and economic stability and competition. This effort might well be China's "Great Leap Forward," prematurely predicted by Chairman Mao but realizable via digital technology.