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# China Center
## For Economics and Business

# Innovation and China's Economic Future



## Becoming a Global Leader in Innovation by 2020

China has taken its place among the world's largest economies. But behind the admirable economic boom of the past thirty years is the fact that the level of technological contribution to China's growth lags well behind that of other major economies. In response to that gap, China has launched a national campaign to develop an enhanced capability for innovation. One of the key elements of the government's 11th Five Year Plan is the goal to become a society that successfully supports innovative thinking and a global leader in innovation by the year 2020.

The National Bureau of Statistics (NBS) has been charged with a key role in this initiative, including defining, measuring and analyzing China's innovative activity in the coming years. As an important part of this effort, NBS joined with The Conference Board on two important efforts to help define the key issues faced by China:

- The 2006 Economic Growth Forum: Innovation and China's Economic Future was held on October 21-22, 2006 in Suzhou, China. It brought together leaders of the Chinese government, Chinese and foreign business leaders, academics, and industry experts to share their perspectives on innovation and China's future.
- A Survey of 1,600 Chinese enterprises and 90 large US companies was conducted to provide insight into the current state of innovative activity in these companies and some comparative information on organization and investment in research and development.

This report summarizes the discussion, findings and debate of the 2006 Economic Growth Forum.

## Speakers

Mr. Xie Fuzhan, Commissioner, National Bureau of Statistics

Ms. Gail Fosler, Executive Vice President and Chief Economist, The Conference Board

Mr. Zhang Weiguo, Vice Governor, Jiangsu Province

Mr. Yan Li, Mayor, Suzhou Municipality

Ms Zhang Meiying, Vice Chairwoman, The Chinese People's Political Consultative Conference

Mr. Su Ning, Vice Governor, People's Bank of China

Mr. Liu Shijin, Deputy Director, Development Research Center of the State Council

Mr. Adrian Dillon, Chief Financial Officer and Executive Vice President, Finance and Administration, Agilent Technologies

Dr. Zhang Weiying, Dean, Guanghua School of Management, Peking University

Mr. Shang Ming, Director-General, Department of Regulations and Laws, Ministry of Commerce

Mr. Craig Mundie, Chief Research and Strategy Officer, Microsoft

Mr. Zhang Baolin, Vice President, Changan Automobile (Group) Co., Ltd.

Ms. Leila Fernandez-Stembridge, Officer, Delegation of the European Commission in China, European Union

Dr. Kenneth DeWoskin, Senior Advisor, PricewaterhouseCoopers

Mr. Zhu Congjiu, President, Shanghai Stock Exchange

Mr. Ronald Want, Head of Investment Banking, Softbank Investment

Mr. Erh-Cheng Hwa, Chief Economist, China Construction Bank

Mr. Gregory Shea, President and Managing Director, US IT Office, Beijing

Mr. Ching Chuiang, President, Motorola China Technology Limited, and Director, Motorola China R&D Institute

Ms. Piper Cole, Vice President, Global Public Policy and Government Affairs, Sun Microsystems, Inc.

Dr. Andreas Tschirky, General Manager, Roche R&D Center China

Dr. Francis Ka Kui Lung, Director, China & International Business, MTR Corporation Ltd.

Mr. Bijan Dorii, Managing Director, GE China Technology Center

Mr. Thomas Parenty, Author, Digital Defense

Mr. Richard Johnson, Senior Partner, Arnold & Porter, LLP

Mr. Xu Xianchun, Deputy Commissioner, National Bureau of Statistics

Mr. Yao Jinguuan, Chief Economist, National Bureau of Statistics

Mr. Xu Yifan, Deputy Commissioner, National Bureau of Statistics

## Forum Overview

The Chinese Economic Growth Forum was held in Suzhou, China on October 21-22, 2006. It was co-sponsored by The National Bureau of Statistics, The Conference Board, Jiangsu Province and Suzhou Municipality. The Forum was attended by more than 200 participants from government, Chinese and multi-national companies, industry associations and academia.

The purpose of the Forum was to bring together government leaders and policy makers, CEOs of Chinese and global companies, academics and technical experts to discuss China's focus on becoming a global leader in innovation by the year 2020.

## Opening Comments

**Commissioner Xie Fuzhan** of NBS opened the conference by stressing the crucial role innovation will play in the sustained growth of China's economy in the coming years. Innovation, particularly technological innovation, is vital to global economic growth and provides the opportunity for developing countries to reduce the gap with the developed world and achieve rapid economic advances.

The Chinese government has made "enhancing the capability of independent innovation" a core strategy in the Eleventh Five-Year Plan. The enhanced creativity of society as a whole and the development of an innovation-based nation were also listed as one of the nine major goals for building a harmonious socialist society by the year 2020 by the Central Committee in the recent Sixth Plenary Session, which confirms the importance given to this effort by the Chinese government.

There is a sense of urgency involved in the move to enhance innovation. There are long term structural conflicts in the Chinese economy that will impede continued economic development if they are not addressed.

First, while economic growth is fueling industrial expansion, there is uneven development between urban and rural areas, unbalanced regional growth, a huge consumption of energy and environmental pollution.

Second, the marginal labor force in rural districts is moving into non-agricultural industries, providing cheap labor for the development of second and third tier industries, but also exerting a huge pressure on employment, social security and unified planning in urban and rural areas.

Third, the role of the socialist market economy in resource allocation continues to improve, which enhances the efficiency of economic operations. On the other hand, the ability to manage and track key economic parameters becomes more difficult and blocks the national economy from taking the track of scientific development.

Fourth, China continues to open to the outside world and China's economy is more linked to the global economy, which leads to more dependence on the outside world and increased risk.

We need to face all these challenges in order to develop ourselves and revitalize China. Otherwise, the conflicts may become acute and economic development delayed. An important way to address such problems is to transform our growth pattern through innovation.

In her opening address, The Conference Board's Executive Vice President and Chief Economist **Gail Fosler** acknowledged the important role that the National Bureau of Statistics plays in defining and measuring the progress of China's innovation strategy and the effect it will have on China's economic growth. The Conference Board and NBS are natural partners in this effort because of their history of cooperative work in developing and refining statistical measurement of China's economy. The intention of China to become a truly global player in innovation by the year 2020 will require a global perspective and increased transparency that NBS is committed to achieving.

> "Forums such as this unite the National Bureau of Statistics and The Conference Board in a common purpose – to support the continuing growth of high quality economic data and analysis that allows both the Chinese government and private enterprise in China and around the world to make informed strategic choices."
>
> **Gail Fosler**, Executive Vice President and Chief Economist, The Conference Board

## Theme Report

**Madame Zhang Meiying**, the Vice Chair of the National People's Political Consultative Conference, placed the conference theme in the context of the 11th Five-Year Plan, which calls for an innovative society by the year 2020.

Technological innovation is driven by the internal demand of the economy. Capital input can lead to high economic growth, which China has certainly experienced, but heavy capital input will result in surplus and low efficiency. Only technology-based growth is sustainable and reliable.

Currently, China still relies heavily on the import of high-tech products. China's participation is primarily in assembly, which is low value-added. If core technology is controlled by others, China's national economy is insecure. In order to change this situation, innovation is essential.

In developed countries, 80 percent of R&D is carried out in companies, while in China only 24 percent of Chinese companies have R&D departments and only 30 percent have R&D facilities. The reasons for this are obvious: companies lack internal motivation due to the high risk of innovation; companies have a shortage of funds for investment in R&D; and there is generally weak technical capability in Chinese companies. China's R&D expenditure only accounted for 1.32 percent of GDP in 2005.

The government sees the following steps as necessary to promote an innovative economy:

1. Invest to support long-term development.
2. Increase the technological sophistication of China's manufacturers.
3. Improve energy efficiency and conservation.
4. Establish a scientific innovation system with enterprises as the major players.
5. Use government policy, such as government procurement, to support domestic companies.
6. Increase capital input by improving the financial system and encouraging venture capital.
7. Focus on talent recruitment and retention, creating an environment where innovative action is rewarded.

## Keynote Addresses

Three leaders were invited to speak on the topic of China and innovation in the context of globalization.

**Mr. Su Ning,** Vice Governor of the People's Bank of China, spoke of the need to increase the level of innovation in China's financial system so that it is better adapted to economic development. One important goal is the creation of new financial technology tools to better manage financial risks. Another goal is to develop increased innovation in financial markets, including creating new financial products and services.

As China's financial institutions become more integrated with financial markets globally, risk management has become the major driving force of financial innovation. New products are emerging at an accelerated pace and financial technology, particularly information technology, has played an increasingly important role.

China's financial system can help support innovation through the promotion of innovative development of market mechanisms, the strengthening of the regulatory system, further reform of interest rate marketization and foreign exchange management, the establishment of protection for securities investors and an improved financial exit system for investors.

**Mr. Liu Shijin**, the Deputy Director of the Development Research Center of the State Council (DRC), spoke about the relationship between "indigenous", or independent innovation and foreign company R&D in China.

First, the innovation activities conducted by foreign enterprises legally registered and operating in China are all covered in the scope of independent innovation. The reason is that such enterprises are Chinese enterprises at law, although some of their investors are from abroad. As part of increased globalization and marketization, investors from abroad come to invest in China and more and more Chinese investors go abroad to invest, resulting in fewer and fewer enterprises with pure Chinese origin. Since the output value, employment and taxation of such enterprises are considered part of China, their R&D and innovation should logically also be regarded as a part of China.

The fostering of independent innovation is happening in two ways: First, the promotion of the innovation ability of enterprises funded with domestic capital and, second, the transfer of R&D capability of foreign-funded enterprises to China. We give priority to the domestic enterprises when talking about independent innovation now and we are clear that we must depend on ourselves as we cannot get everything from others. But this focus on our independence does not conflict with the transfer of the R&D capability of foreign-funded enterprises to China and both should be interactive and complementary.

"The R&D of foreign funded enterprises needs to be supported in China. We should regard the R&D and innovation of foreign-funded enterprises as a part of our independent innovation and encourage it, as this will support the innovation of domestic enterprises and the overall innovation ability of China's economy."

**Liu Shijin**, Deputy Director, DRC

Finally, China needs to improve the support of capital markets for innovation. Policy should encourage the development of venture capital and efforts should be made to cooperate with international venture capital. A "failure-tolerant" culture will help support and encourage entrepreneurs.

**Mr. Adrian Dillon**, Chief Financial Officer and Executive Vice President, Finance and Administration, Agilent Technologies used Agilent's experience in sustaining innovation over time as a practical model of what elements need to be considered by companies.

He noted that most talk about innovation emphasizes "invention". Invention is only one part of an overall process and involves creating something new. Implementation happens in the second part of the continuum. Implementation makes a new idea real, profitable, and a standard for the way things are done. Innovation happens throughout the continuum. It is about the transformation of creativity into impact. If invention is creating something new, then innovation is doing something new.

Innovation is not limited to technology. Process innovation can also drive corporate success and economic growth. An example from Agilent is one of the company's order fulfillment centers in Asia. The company needed to improve the accuracy and responsiveness to customer requirements changes. Among the process innovations, Agilent changed the simulation and analysis process from a weekly batch mode to real time and changed from a human-dependent process to a more accurate and logical IT process. As a result, the turnaround to simulate supply and demand changes improved from 5 days to 5 seconds. The part availability simulation was reduced from 43 hours to 3 minutes. Accuracy improved, as did the customer experience.

Continuous innovation of this kind will help to sustain the quality of growth in China.

Next, China needs to institutionalize an innovation benefit. Successful innovation requires communication and collaboration across organizations, functions, and disciplines. Organizations must be able to take advantage of windows of opportunity. Within this process, disconnects can happen. An invention disconnect results in lots of efforts, but few products. And an implementation disconnect results in lots of products, but little return. The solution is to turn innovation into a process that is systematic, measured, monitored, and managed at all levels of the organization. Measurement should be based on milestones, not body or dollar count.

"Invention, implementation, and innovation are all critical to economic success. Successful innovation can be technological, economic, institutional, and even organizational. All types of innovation can drive economic growth."

**Adrian Dillon**, CFO and Executive Vice President, Agilent Technologies

In order to systematically manage its innovation program, Agilent conducts an annual strategic plan review, where specific growth initiatives are identified. A quarterly senior executive review monitors – among other things – the number of new products that generate growth.

Agilent also has a process for measuring the innovation benefit. It monitors actual vs. target share of new products in total revenue, as well as new revenue growth. Agilent conducts quarterly competitive benchmarking of R&D spending vs. revenue growth against peers, as well as return on invested capital against peers. And the company maintains quarterly tracking of customer loyalty and satisfaction.

China's current emphasis on innovation to drive growth should be encouraged. It is fundamental to raising the standards of living for all Chinese. It closely allies the interests of China with those of the developed world. It enables China to transition upward in the global value-added curve. And it enables poorer developing countries to join the same developmental journey.

**Professor Zhang Weiying**, Director, Guanghua School of Management, Peking University, concluded the keynote session by summarizing four characteristics of China's current economy:

- Globalization is essential to it's economic success;
- China's GDP may be underestimated;
- the country produces a high volume of product but receives little in value; and
- the country's output is primarily low tech and low cost.

There are several reasons for the lack of innovation in Chinese companies. First, when making money is easy, a firm has little incentive for innovation. Why invest in more skilled people, better products and improved processes when you don't have to?

Second, Chinese companies are too young, lacking technological accumulation of patents and technology, so there is nothing to build on.

"In order to promote innovation in Chinese organizations, IPR protection is fundamental. The incentive for innovation in these companies is low because of unsecured IPR protection. Innovation takes time and needs heavy investment and high risk. With no guarantee they will reap the reward of investment, companies do not have long term strategies. "

**Zhang Weiying**, Director, Guanghua School of Management, Peking University

Current deregulation and competition policy take too much of an entrepreneur's time and energy, so they cannot focus on innovation. Capital markets need to allow capital to flow effectively to innovation sources. China's education systems need to be closely aligned with industry and the market to prepare graduates who are prepared to be productive immediately.

Business corruption has a deadening effect on new ideas. It tends to result in old products continuing to sell, while advanced products are crowded out of the market because of lack of relationships.

China needs to be dedicated to solving institutional problems, especially related to the legal system, in order to achieve the rule of law.

## General Session 1: Responding to the Global Challenge by 2020

**Mr. Shang Ming**, Director General, Department of Regulations and Laws, Ministry of Commerce began the afternoon session by noting the strong foundation for innovation that is already in place.

Institutional reform has deepened and will continue. Innovation capability in the coastal areas such as Guangdong Province has gradually come into being. The opening of the service sector has led to a more high quality work force. The allocation of internal resources within companies has improved. There is expanded technical exchange with foreign companies.

Efforts to protect IPR are improving. For example, more than 50 cities have set up IPR complaint centers and work continues on legislation and the enforcement of IPR protection.

These changes all help promote an environment that encourages companies to adopt an open innovation approach.

**Mr. Craig Mundie**, Chief Research and Strategy Officer of Microsoft, focused on the session's topic: What does any country that seeks to be a global leader in innovation by the year 2020 have to focus on? He discussed a number of important areas that need to be addressed.

First, the key question for all companies in the world who seek to operate in this increasingly high technology environment is availability of the talent pool. A country's education system needs to focus on developing a workforce that is competitive in an increasingly high tech world. Microsoft, starting in China a few years ago, created a program called "The Imagine Cup", programming competitions between young people in the Chinese universities. It became so popular that it went to an Asian program, then global program, and it draws literally thousands of teams from thousands of universities around the world. These, are very important programs and should be cultivated broadly within China.

English skills will continue to be important as China seeks to do business more globally, and to draw talent into the country from elsewhere.

It will be important for China to create knowledge exchange programs, and people exchange programs. China may have to focus for awhile on importing talent that has experience in handling large scale technology projects and complex technology development projects.

China needs to create global educational institutions and an environment where it is attractive for international students to come to China. The schools needs to be held to a high global standard, so just as the companies talk about benchmarking against global greatness, so should the universities, and even the high schools.

> "The goal for China in the area of education and talent development must be to create a globally diverse faculty and student body. The exchange and influx of talent both in business and in education will do a great deal to prepare the country for the global environment."
>
> **Craig Mundie**, Chief Research and Strategy Officer, Microsoft

The next area that will be critical for China will be a well-orchestrated approach to research. Research comes in two different classes. There is fundamental or very basic research. This should be done in universities or national laboratories. The government funding of this basic research should perhaps reach as high as 3 percent of the GDP.

The second category is medium term research. A distinction should be made between development activities and pure research functions. Drawing on Microsoft's experience, Bill Gates believed, even as he formed the young Microsoft, that having an organization that reached beyond the current product activities to focus on research independent of productization requirements would be critical to the long term success of the company. Many enterprises in China today do not have any research functions. They focus almost exclusively on current day development activities.

> "While most organizations and policy makers say Research and Development – "R&D" – as if was one thing, from a policy point of view they must be considered two things. Innovation happens and corporate agility stems from the ability to have a complementary investment over the long term in both research and development."
>
> **Craig Mundie**, Chief Research and Strategy Officer, Microsoft

In order to encourage investment in midterm research, particularly in the industrial areas, new tax policies need to be developed to create tax advantages for this type of research. Additional policies have to be put in place around capital formation to make sure start-ups and other young companies are able to gain the resources they need and be able to grow quickly. In the United States, tax policy related to venture capital investment has had a dramatic effect on the amount of money available for financing start-ups.

Information and communications technologies are also extremely important for innovation and economic growth. To increase productivity in every aspect of society, investment in IT needs to be near the top of the list. Clearly, information technology has begun to be deployed quite broadly in China, but it is probably not yet at the level that is required in order to be globally competitive.

India, which is well noted for its prowess in outsourcing and software technologies, is, perhaps surprisingly, an example of a country whose policy is not well developed in this area. Microsoft did a study last year with NASCom, the National Association of Software Companies in India, which showed that while India ranked first in its ability to do outsourcing in the information technology area, it ranked last among the 30 countries studied in terms of its own internal deployment of information technology.

For the last two five-year plans the Chinese government has recognized the importance of informatization of all sectors. However, it will require continued diligence and forward-looking policies to ensure appropriate domestic investment, not just in the development of information technology as an industry, but the complete deployment of IT in all sectors in the economy.

To truly encourage innovation growth, the government should maintain neutral policies on procurement preferences in order to ensure that all companies have the ability to compete on a level playing field within this environment.

Communication technology will continue to be critical. China has already benefited from the leap-frogging effect of cellular telephony compared to the traditional wireline telephony. There are similar techniques that can be applied to provide this leap-frogging capability, particularly around new forms of wireless communication, but this will require forward looking spectrum management policies. New areas of the spectrum and the novel types of radio technology that will emerge to take advantage of them could provide yet another accelerator for the development of Chinese technology and deployment of it broadly within the society.

The final area that countries and companies need to pay attention to is knowledge creation and intellectual property. The laws that have been put in place for a number of years in China to protect intellectual property have shown a dramatic increase in emphasis at the highest level of government. However, to be a knowledge economy by 2020, on an equal basis with other global leaders, a great deal more in intellectual property protection and enforcement will be required.

In addition, it will be critical to keep this knowledge creation and intellectual property environment a relatively open one. All countries go through different phases, where different protectionist sentiments may emerge and different non-trade barriers may be considered in order to provide advantages to local companies. But one only has to look at other regions of the world to become informed on the fallacy of these types of strategies. The Asian economies that have had strong intellectual property protection and open foreign investment policies have grown over the last decade at three times the rate of Latin America economies that to this day still have not achieved that degree of openness.

It will require not only a continuing focus on high quality domestic patent filing, which has improved quite dramatically, but an increasing emphasis by Chinese companies to pursue international patents. The government must also pursue programs of regional or bilateral patent harmonization in order to improve the efficiency and lower the cost of Chinese companies having patent protection as they reach out into a global marketplace.

Universities need to be measured, not just on the students that they train, but also on the number and quality of patentable ideas that they create.

This is a pattern that is evolving quickly, particularly in the United States and Europe. Incentives have been created for research professors to benefit from the patents they create. At the same time management processes have been applied to the university administrations to ensure that research activities actually manifest in patents that are produced by the universities themselves. This will be an important activity to pursue further in the next 15 years.

**Mr. Zhang Baolin**, Vice President, Chang'an Auto Group, viewed the requirements for leadership in innovation from the perspective of the global automobile industry. By the year 2010, domestic sales of automobiles will reach 8 million a year and by 2020, China will be the biggest auto market in the world.

The impact of this growth on the environment and energy consumption is immense and needs to be addressed immediately. Internal development along with cooperation with premium designers in Europe, Italy and Germany is the key. Chang'an has sent more than a thousand staff to study and be trained abroad. Government support is needed, particularly in R&D funds.

Ms. Leila Fernandez-Stembridge, Officer, Delegation of the European Union in China, reviewed the advances China has made in recent years and its big advantages, including a huge internal market with large potential economies of scale, its aggressive entrepreneurial base and its human capital.

Chinese firms are not well known abroad. Europe is very interested in China's go abroad policy and does not have the handicap of the US security policy. Europe wants to sell knowledge in distribution and sales and logistics networks. This could create a complementary support to Chinese companies that are seeking to internationalize by 2010.

## General Session 2: Values and Valuations of Innovation

**Dr. Kenneth Dewoskin**, Senior Advisor to PricewaterhouseCoopers led a session on the ways markets value innovation in enterprises and what investors seek in deciding to sponsor corporate innovation. The discussion included insightful comments from Mr. Zhu Congjiu, President, Shanghai Stock Exchange, Mr. Ronald Wan, Head of Investment Banking, Softbank Investment, and Mr. Erh-Cheng Hwa, Chief Economist, China Construction Bank.

> "Ultimately, markets determine the value of innovation. "Valuation" is the technical processes that can be used to determine a "book value" for innovation for various purposes, including asset transactions, taxation, and various forms of compensation. Innovation also has a "Value" in a financial sense, which is only revealed by markets."
>
> Kenneth Dewoskin, Senior Advisor, PricewaterhouseCoopers

The financial value of innovation at the enterprise level is unlocked during transactions, such as IPOs, M&A transactions, and financial fund investments.

Who values and valuates innovation? Shareholders, acquirers, senior management and governments setting policy all look at the value of innovation.

In general, there are six technical approaches to valuation:

1. Development costs: The actual verifiable cost incurred to develop the asset (patent, copyright, trademark, etc.)
2. Replacement costs: What it would cost to replace the asset at current costs – useful for trade secrets and patents
3. Discounted revenue: Assuming the asset will produce revenue, the discounted present value of the revenue stream
4. Market value: Assuming the asset can be leased or sold, what is the price the market will pay for it or its use?
5. Incremental value: What the innovation adds to market price of the company's products or reduces in costs
6. Tax formula: The remainder of a firm's actual profits, subtracting its proposed profits based only on tangible assets.

> "In the real world, the value of an innovation is subject to the loss resulting from infringement and imitation and is highly dependent on the willingness and ability of the innovator to manage, protect and aggressively defend the marketplace value of the innovation."
>
> **Kenneth Dewoskin**, Senior Advisor, PricewaterhouseCoopers

The market will often reward companies with a history and reputation for innovation far beyond their book value – for example, Google and Baidu. The highest stock price to book value ratios are in companies with the largest number of patents and/or the strongest reputation for innovation. A large number of patents/trademarks persuades investors that the company has a strong culture of innovation and the high or low value of a few products is not important.

Companies have created ultra-high share holder value through all types of innovation. For example, IBM, Pfizer, Microsoft, Philips, Sony, Intel and Motorola have created innovation value through registered IP, including trademarks, patents and copyrights. Companies such as Coca-Cola, McDonalds, Citigroup, Toyota, Apple, Gucci, Baidu and Tongrentang have created value through intangible assets, such as brand value, know-how, trade secrets and good will. Some companies have strong cultural assets such as a culture of innovation, innovative systems and high quality processes. These include General Electric, ABB, B&Q, Alibaba and Shanda.

Ultra-high value innovations are rarely "new". There are many examples of companies who created value by taking an existing technology, process or product and extending it in ways that transformed an industry.

Ultimately, three elements determine the value of innovation.

- First is the investor story. Investors pay high premiums for companies like GE, Google, Baidu, Microsoft and Shanda because they believe the companies have leadership and culture that will continue to innovate.
- Second, the revenue model has to work. Many e-commerce start-ups, for example, created high levels of traffic but no revenue.
- Third, high value innovation must be related to market demand and demonstrated revenue potential. Innovation may have great cultural or scientific value, but little market value.

**Mr. Ronald Wang**, Head of Investment Banking at Softbank Investment Bank, mentioned that traditionally enterprises have depended on banks for their major source of financing. Now, however, mergers and acquisitions are fast becoming a preferred alternative for enterprises to raise funds in China and at the same time grow in size and strength. Private funding is another source that is waiting to be developed.

**Mr. Erh-Cheng Hwa**, Chief Economist, China Construction Bank, pointed out that innovation requires high risk investment and support of the capital markets. State-owned commercial banks need to improve their risk management abilities, thereby helping small to medium sized enterprises acquire capital.

## General Session 3: New Approaches to Global Collaboration in Innovation

**Mr. Gao Minghua**, Director, Corporate Governance and Enterprise Development Research Center, Beijing Normal University, spoke about collaboration between Chinese and foreign organizations from the Chinese perspective.

There are several main reasons for companies to pursue joint innovation: To shorten the time and improve the efficiency of development efforts and to share the cost and lower the risk of innovation.

However, Chinese companies need to focus on developing their internal innovative ability and look on collaboration with foreign companies as a temporary transition. The link between research organizations and industry needs to be strengthened. Most Chinese researchers work for research institutions and their research results cannot effectively be converted to productivity. Most Chinese patents do not result in marketable products.

To be successful, China needs to create a corporate culture that helps nurture self-reliant innovation and innovative talents.

**Mr. Gregory Shea**, President and Managing Director of USITO Beijing, placed his comments on global collaboration in the context of an "ecosystem" framework that the USITO Innovation and Competitiveness Working Group has been developing for the consideration of innovation policy makers in China.

The framework consists of a three stage innovation cycle with Intellectual Property Rights (IPR) at the core: Creation, Protection, and Application/ Distribution. Policy measures can foster or hinder each of these vital processes.

It is important to consider innovation in the context of society as a whole, and include all aspects of the cycle.

The subsequent panel discussion on global collaboration as a component of China's innovation policy included comments from **Mr. Ching Chuang**, President, Motorola China Technology Limited and Director of the Motorola China R&D Institute, **Ms. Piper Cole**, Vice President of Global Public Policy and Government Affairs of Sun Microsystems; **Dr. Andreas Tschirky**, General Manager, Roche R&D Center China; **Dr. Francis Ka Kui Lung**, Director, China & International Business, MTR Corporation Ltd.; **Mr. Bijan Dorii**, Managing Director, GE China Technology Center, **Mr. Thomas Parenty**, Author of Digital Defense; and **Mr. Richard Johnson**, Senior Partner, Arnold & Porter LLP.

> "Innovation never lives in a vacuum. It is built on innovations that have come before. The key is to find the balance between protecting IP enough to make the risk of innovation worthwhile, while leaving IP open enough to allow the next innovation to be built on top of it. Open sourcing and open systems drive innovation and grow the market for everyone."
>
> **Piper Cole**, VP, Global Public Policy and Government Affairs, Sun Microsystems

*Innovation does not always mean domestic standards.* Panelists pointed out that sticking to domestic proprietary standards will substantially affect the end users' benefits in China (consumers, Chinese enterprises and government users) and limit international expansion. Indigenous innovation should also learn from other countries.

> "Large scale core technological innovation almost always involves networking with individuals and centers of excellence around the globe. Governments should focus on the promotion of "international innovation capacity", that is to enhance the capacity of individuals and organizations based in the country to make ever more valuable contributions in international innovation collaborations. This process allows core technologies to move forward very quickly. Individual companies can then choose to develop proprietary products to exploit the technology."
>
> **Piper Cole**, VP, Global Public Policy and Government Affairs, Sun Microsystems

*It is important not to set up barriers to either domestic or foreign innovation.* Economies that have imposed protectionist policies have invariably become less innovative and less competitive in the global marketplace because they were not challenged by internal or external competition.

*The ability to reach global markets quickly will benefit from more efficient government processes for review and approval.* One example is shortening the time needed to consider and set standards. In fast-moving fields such as IT, a technological advantage may disappear during the time needed to choose a standard.

*Entrepreneurial innovation will benefit from a more favorable investment and working environment.* When entrepreneurs lack this support, they tend to leave, so that much fundamental innovation continues to be done overseas by Chinese entrepreneurs.

One of Sun Microsystems's founders, Bill Joy, coined "Joy's Law": Innovation will happen, and it will happen somewhere else.

**Andreas Tschirky,** General Manager of Roche China noted the international nature of innovation. Roche maintains a diversified research staff from over 100 countries and encourages and facilitates knowledge exchange with experts around the world.

**Bijan Dorri**, Executive Vice President and head of the GE (China) Technology Center spoke of two important intersections: First, it is important to have the best people within the company, both business and research people, and to collaborate with universities, government agencies, lawyers and others outside the company. Second, it is important to ensure collaboration with every region of the parent organization and collaboration within the region with suppliers, customers and other outside parties.

**Francis Lung**, Director, International Business of MTR Corporation addressed the need for innovation in financing public works. MTR introduced market mechanisms for financing Hong Kong's rail construction and operation. Operation innovation involves collaboration with real estate developers to improve the utility of rail expansion. Finally, MTR has sought innovation in the diversification of its business lines and continues to explore productivity-enhancing, value-added services such as the Octopus Card.

## Closing Summaries

In the closing session of the Forum, **Mr. Xu Yifan**, Deputy Commissioner, National Bureau of Statistics, reflected on the presentations over the previous two days. He felt that it was clear from the discussions during the forum that innovation will become a key element in China's quest for greater economic growth. Innovation will be the deciding factor in the pace and rate of economic growth.

- Innovation will support faster economic growth. Whether it is innovation in technology, markets, management or policy, large-scale innovations will inevitably bring about continue productivity improvements, leading to faster economic growth.
- Innovation will bring about more efficient use of resources, produce higher yields and thereby a higher rate of economic growth.
- Innovation can bring greater stability to our economic growth. Compared to primary and secondary industries, the service industry enjoys greater growth stability. A greater emphasis on innovation in the service industry will result in reduced fluctuation in the economy

## Areas of Consensus

- The Chinese economy has moved to a new phase, an "innovative era". The first phase of China's recent economic history involved cheap labor; the second, cheap capital and resources. Now innovation must become the major driving force for the long-term stable growth of the Chinese economy.
- Enterprises will become the major driving forces of innovation, requiring close collaboration among government, research institutes and enterprises.
- Successful innovation requires an environment that is fair, open and creates support and encouragement for entrepreneurialism. This will require a positive attitude toward risk and tolerance for the failure that is an inevitable part of the innovative effort.
- Innovation and globalization are interdependent. China's focus is on both developing its own capabilities and attracting foreign R&D centers to China. In addition China needs to participate as a partner in the global collaboration networks that facilitate rapid technological and process development. Successful innovation is no longer constrained by borders.
- Innovation requires protection for intellectual property rights (IPR). Because of the high risk involved in innovation, IPR protection is an incentive for entities to undertake that risk.
- Innovation requires capital. The development of both public and venture capital markets will provide effective support for the development of innovation. Current financing still relies heavily on bank loans, while merger & acquisition and private placements are additional sources that need to be expanded. The government should develop policies that encourage venture capital for companies that invest in R&D.
- A well-developed education system is crucial. Speakers stressed the need for continued excellence in mathematics and science, foreign languages and engineering.
- Innovation requires a set of scientific evaluation systems or metrics. Survey results in China and the US revealed many different definitions of "innovation". Measurement of innovation should focus on top and bottom line results over the long term rather than the number of patents, new processes or awards.
- Innovation is a long term strategy. It requires investment in R&D, particularly fundamental research. As a developing country, China should invest more in fundamental scientific research, in order to support sustainable economic growth. Again, policies should support venture capital as a way to encourage the risk taking involved in long term R&D investment.

> "If we regard China's reform and open-door policy as the main reasons for its continuous and steady economic growth over the past twenty years, then innovation will be the key to further and sustain this growth."
>
> **Xu Yifan**, Deputy Director National Bureau of Statistics

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For more information, please contact:

**The China Center for Economics and Business**
**Preparatory Office**
7-2-72 Qijiayuan, 9 Jianwai Avenue
Beijing 100600 P.R. China
Tel +86 10 8532 4688
Fax +86 10 8532 5332
china.center@conference-board.org

Publishing Director **Chuck Mitchell**

Author **Meg Gottemoeller**

Design **Peter Drubin**

Production **Joann Lemon**

**The Conference Board, Inc.**
845 Third Avenue
New York, NY 10022-6679
United States
Tel +1 212 759 5404
Fax +1 212 980 7014
www.conference-board.org

**The Conference Board Europe**
Chaussée de La Hulpe, 130, Box 11
B-1000 Brussels, Belgium
Tel: +32 2 675 5405
Fax: +32 2 675 0395

**The Conference Board Asia-Pacific**
22/F, Shun Ho Tower
24-30 Ice House Street, Central
Hong Kong
Tel: +852 2804 1000
Fax: +852 2869 1403

**The Conference Board India**
D-3/34 92, Vasant Kunj
New Dehli - 110 070, India
Tel: +91 11 689 8869
Fax: +91 11 689 9930