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CHINA CHALLENGES TO AMERICA: AN ECONOMIC AND CULTURAL PERSPECTIVE

Abstract:

Napoleon Bonaparte once said that “China is a sleeping giant. Let her sleep, for when she wakes, she will shake the world.” In 2008, American prize Nobel of economics, Joseph Stiglitz asserted that no society in human history has undergone such a rapidly transformation as China did in the last 15 years. Indeed, the economic performance of China in the last 35 years marveled the world at many levels. Not surprisingly, the United States follow with great interest the rise of China as the latter plays an increasingly international role. As a result, the American authorities have multiplied meetings with Chinese leaders to strengthen their bilateral relations. Enhancing the importance of the meetings of the G-20, Washington has implicitly acknowledged that China has become a major player in the global economy. Meanwhile, China has surpassed Japan to become the second largest economy in the world. In addition, the rise of China has been so rapid that many observers are questioning whether or not China would overtake soon the United States to make the 21st century a Chinese century as the 20th century was an American one.

Keywords:

China challenges to America

Napoleon Bonaparte once said that “China is a sleeping giant. Let her sleep, for when she wakes, she will shake the world.” In 2008, American prize Nobel of economics, Joseph Stiglitz asserted that no society in human history has undergone such a rapidly transformation as China did in the last 15 years. Indeed, the economic performance of China in the last 35 years marveled the world at many levels. Not surprisingly, the United States follow with great interest the rise of China as the latter plays an increasingly international role. As a result, the American authorities have multiplied meetings with Chinese leaders to strengthen their bilateral relations. Enhancing the importance of the meetings of the G-20, Washington has implicitly acknowledged that China has become a major player in the global economy. Meanwhile, China has surpassed Japan to become the second largest economy in the world. In addition, the rise of China has been so rapid that many observers are questioning whether or not China would overtake soon the United States to make the 21st century a Chinese century as the 20th century was an American one.[1]

Some observers are convinced that the Chinese dream is to see their country to become the 21st century world superpower. As a matter of fact, this dream is not new. For centuries, even millennia, China has seen herself as the Middle Kingdom, as the center of the world. Moreover, China is now positioning herself as a future global power by proposing a new capitalist model, an alternative to the American model. If American capitalism has developed in the late 19th century to the scale of a continent, the Chinese model has taken the size of a super continent. Six Chinese provinces have each a GDP exceeding countries like Russia, Canada and Spain. While American capitalism is based on values such as democracy, liberalism and individualism, Chinese capitalism is more authoritarian, ubiquitous and strategic, although highly competent. Indeed, China does manifest many signs of a great power as Beijing is aware of its long historical heritage.[2]

As a result, the economic growth of China remains a concern for many observers of the world scene as the country is on the road to become a giant of innovation and a world leader in advanced science and technology. Such a prospect inspire shock and fears abroad as China :

- has already overtaken the United States and Japan to become the largest recipient of patent applications;
- is expected to overtake the United States as the largest source of scientific publications per 2020;
- has more than a million university students who graduate each year in engineering;
- is funding from the state government up to two trillion dollars in five years in areas such as clean energy, information technology, biotechnology, advanced manufacturing and new materials.[3]

The present paper will attempt to demonstrate why it is economically difficult or even impossible for China to replace the United States and to assume the role of world leader in innovation. To make our case, we will examine how :

- the U.S. technological lead is almost overbearing;
- The Chinese economy is still largely underdeveloped, while the U.S. economy has entered to the third phase of the industrial revolution, the intelligence revolution;
- And finally, how the United States, with the best higher education system in the world, not only have a considerable technological and scientific advance on China, but they are maintaining it by investing every year twice as much as China in technological innovation.

The Chinese approach to innovation

In 1978, China quickly abandoned the policy of central planning to adhere to the market economy. Then, a new class of entrepreneurs has emerged which took advantage of available modern technologies. China has thus enjoyed a sustained growth based on three elements: low cost of labor, availability of land and access to modern Western technology. This approach gave rise to the Chinese miracle of the last three decades. However, this cycle is coming to an end. The competitive advantage of China is fading rapidly. To remain at the forefront, China needs to become an innovative nation. To do this, the country must experience a new cultural revolution. It needs to develop a policy centered on five principles:

- Developing a class of businessmen which is financially imaginative;
- Having a class of leading researchers;
- Adopting a culture that encourages innovation and new ideas;
- Allowing the free flow of information;
- Developing a willingness to take risks and to advance by trials and errors.[4]

As Japan and the Asian tigers did previously, China has significantly narrowed the gap with developed countries by adopting a strategy of copying and imitating the Western technology. This crony capitalism has led to a rapid economic growth, but this short-term strategy goes against the long-term development of Chinese enterprises and the creation of a spirit of innovation. This strategy overcomes temporally the lack of original research by passing out with problems related to intellectual property rights, but it represents an obstacle to the development of a thriving scientific community. That is why Chinese authorities have paid much more attention in the last 15 years to the need to respect of intellectual property. This is the only way to develop a national innovation policy. In addition, a strategy aimed at rewarding innovation makes the economy more competitive and minimizes corruption and cronyism while restoring trust in institutions.[5]

Unlike the Americans who tend to minimize the role of government in the process of innovation while overplaying the role of people like Steve Jobs, the Chinese emphasize the active role of the state. As a result, Beijing has become the major source of the outbreak of scientific research and technology by investing heavily in this area. Indeed, when the Chinese government decides to do something, it does it without worrying about the critics of a free press or about interest groups and thousands of lawyers who will attack its policies.[6]

And yet, the issue of innovation is closely related to the rights of intellectual property. The protection of the latter is essential for the development of new products and the growth of quality jobs. While most indicators show that China still has a long way to go to reach the United States, the country is committed to a policy that puts innovation at the heart of its economy as a catalyst to meet the needs of its development. The plan of the Chinese authorities is not only to develop sustainable energy and to protect the environment, but also to position their country in key areas of scientific research. Only by mixing science and creativity will China be able to generate new ideas and to create new products that would response to human needs. [7]

Nevertheless, Beijing faces huge challenges to position itself as No. 1 as an innovative power. Chinese businesses first need to become able to develop products and services that focus on the future and compete in new markets. A first challenge concerns the adaptation of the Chinese financial market that needs to be cleaned up with having artificially flooded banks and the housing market with cheap capital as a means to support employment. Moreover, the Chinese economy is distorted by political favoritism, preferential financing and granting undue privileges to public enterprises that are slow to adopt the innovative culture. It is in this perspective that the new Chinese leadership under President Xi Jinping seeks to address these problems. Also, China has not yet succeeded in creating internationally recognized Chinese brands. Finally, the Chinese economy needs to develop an innovative class of business leaders in the image of Thomas Edison, Henry Ford and Steve Jobs.[8]

The Chinese government plays a central role in the development of a national innovation system. Indeed, Beijing has adopted a three-pronged strategy as a way to address factors of cultural resistance:

- Adopting national policy of development of scientific literacy (taxation, intellectual property, scientific exchanges, etc.);
- Creating national structures to encourage innovation and experimentation;
- Placing the central government at the center of the innovation process[9]

There is a widespread view in the world that China is attempting to dethrone the United States as the main power in the scientific world. According to this view, far from being satisfied with being the world's factory, Beijing wants to turn China into the first innovative power, thereby challenging American leadership in the global knowledge

economy. To achieve this objective, the Chinese authorities have adopted since 2008 a series of policies to make China less dependent on advanced Western technology. It is why China is investing so heavily in research and development (R & D). As a result, the number of scientific articles published by Chinese scientists in prestigious journals has largely increased since 2011by an annual rate of 9.5%. Moreover, the Chinese scientific publications focus increasingly in critical areas such as nanotechnology and life sciences, showing how China is becoming a serious competitor. [10]

When one looks at the numbers, the scientific ability of China to innovate seems to be grossly exaggerated despite its impressive progress. For example, in 1996 China invested only 0.5% of its GDP in R & D, while its spending has reached 1.98% of its GDP in 2012. Still, in 2010, China accounted only for 12.3% of global spending on R & D, while the United States did for 34.4%. Even so, in 2011, China surpassed Japan as the second largest investor in R & D. If China held already 14% of the global pool of researchers in 2002, it has reached 20% ten years later. Consequently, the share of China in the development of advanced technology has increased from 8% in 2003 to 24% in 2012.[11]

The challenges of higher education

Social researchers consistently show that education and investment in human capital is the most important factor for progress and competitiveness in any economy. At this level, China appears to have the upper etch on the United States since the number of Americans enrolled in colleges and universities are falling down. Therefore, it is urgent for the United States to invest in education. But the opposite is happening. Due to budget cuts, the administration has had to lay off teachers and increase class sizes. And in the meantime, the American high school system continues to deteriorate. Of the 34 developed countries, the ranking of American students of 15 years old has gone from 14th to 25th in mathematics, while the United States have ranked first in this area until 1980.[12]

To improve the education system, the United States would need to proceed, as did Finland, to invest heavily in training teachers and paying them with higher wages. In addition, the size of American classrooms should be significantly reduced. Finally, it would be necessary for American schools to centre more on arts, music and outdoor activities as a way to make education more interesting. But to do so, it requires political will and financial commitment. Now, American taxpayers will not pay the bill and do not want the blame for the failure of their children. However, not everything is negative on the American side.[13]

In China, the opposite is happening. Between 2000 and 2008, China has formed an annual average of 1.14 million university students in science, technology, and

mathematics compared to 496,000 in the United States. In addition, studies estimate that by 2030 China will have 200 million college graduates, more than all American workers. This means that in a relatively short time China will have much more skilled workers in industries where competition is global.[14]

The Chinese education system focuses on providing students with a solid grounding in the basic sciences. But it suffers from a major shortcoming. For thousands of years, Chinese culture has been focused on memorization. This is still true today as the education system is largely based on learning by heart. China is able to produce very intelligent and scholarly minds, but the student does not learn to be creative, to develop an original thought. Indeed, innovation do require first of all a creative mind, one that deals with the most critical and difficult questions. But the Chinese culture rests above all on tradition and respect. As a result, innovation is seen too often as negative. But China needs to overcome that gap, if it wants to become an innovative nation. To achieve that goal, China needs to develop innovative thinkers. Indeed, the characteristic of a culture based on innovation stems from the ability to turn discoveries into useful products. The challenge of education in China today is to develop a creative culture, to bring its thinkers to establish the connection between their scientific discoveries and their practical application in society in everyday life.[15]

The Chinese universities have granted in 1999 less than a million degrees. But that number has exceeded overall seven million in 2013, surpassing the United States in total. But the advantage of China is even greater. While only 5% of undergraduate students in the United States are studying engineering, they are 31% in China. But despite this clear advantage, the United States still prevail as a leader in innovation and its investment in R & D. Chinese universities have still not developed a culture based on innovation. Chinese universities are put in place incentives to keep their best students:

- Research funding ;
- Laboratory Space ;
- Housing Allowance ;
- Job for spouse.[16]

But despite these measures, Chinese universities are unable to retain the best and brightest students who choose instead to pursue research in developed countries. Between 2003 and 2013, the number of Chinese students studying abroad have grown from 120 000 to 400 000. In 2013, 235 000 Chinese studied in the US universities. On the 2.64 million Chinese who pursued studies abroad between 1978 and 2012, barely 41% did return to China. But a Chinese study shows that the most talented Chinese students who pursued studies abroad tend not to return to China.[17]

Many Chinese students, after experiencing the lives in Western academics, are afraid of having to start again once they return to China. They perceive the

bureaucratization of Chinese universities as a major barrier to innovation. Indeed, apart from 70 national universities, some 2,000 other universities and colleges of higher education are managed locally. However, local governments do not hesitate to intervene by transforming universities into bureaucratic institutions. The local authorities are involved in the process of selecting cadres and leaders of universities and even in determining who are the most deserving students. In addition to financial constraints, political influence of local authorities generates a culture of intellectual dishonesty:

- students often cheat in college entrance exams;
- too often teachers don't encourage original research.[18]

Today Beijing aspires for recognition. For centuries, science was held in high esteem by the Chinese elite. How does it make that the country that invented the compass and gunpowder, paddle wheel, paper currency, banking, promotion on merit, does not perform better today? Yet the Chinese government is investing heavily. Only in 2007, the government invested $ 3.75 billion in 147 long-term scientific projects, including the creation of a cosmic ray observatory, a subatomic particle accelerator and other cutting-edge research. Despite the investments made over the last 15 years, China has not yet won a Nobel Prize in science. For a century, nine Chinese have won Nobel Prizes, including Chen-Ning Yang in 1957 for his work on subatomic particles. But all they have undertaken their work outside China and were not Chinese nationals. Meanwhile, the USA had obtained during the 20th century 58% of Nobel prize.[19]

Yet the Chinese government is really trying to create a culture of innovation. The government shows that it understands how science and innovation do play a major role in the global market to make its economy more competitive. Beijing sets up no less than 1,000 technology incubators scattered in various high-tech centers and university laboratories. The stated goal of the five-year 2012 is to achieve a ratio of 3.3 patents per 10,000 in 2017. However, already in 2013, the ratio exceeded 4.02. Yet, most of these patents was not powered by innovative thinking and did not bring any major breakthroughs.[20]

Despite the high number of students who graduate every year, the Chinese education system suffers from a major significant shortcoming. If Chinese students rank first in the good reviews, they do not stand out as being the most creative ones. To be creative, a student must not only acquire and internalize the knowledge, he must also question constantly the results. Once this knowledge has reached his brain, he must consolidate and merge it with other data to produce a finished product. Only then he can see the world differently in order to become creative. The creation is not only a process of intelligence, it also has an emotional one. However, in the Chinese education system, students develop a photographic memory and are capable of producing an instant reply, but they do not learn to be creative. Hundreds of thousands of Chinese students who enroll each year in American universities stand out as docile students who never ask

questions. They are unable to participate actively in a seminar. This problem is still reflected today in the Chinese production that does not stand out for its creativity. Most of Chinese products are derivatives of American brands.[21]

Innovation is no longer a simple investment tool in a promising sector but a scientific commitment that gives opportunities for Chinese capacity to compete with the United States in addition to preparing a smooth transition between the industrial and service sectors.

The Challenges of Research & Development

In 2014, Chinese authors have published more scientific articles than their American counterpart in the fields of physics and chemistry. The region of Shenzhen, located in the Guangdong Province, has just surpassed Silicon Valley in the application for international patents in information technology and communication. Huawei and ZTE, two Chinese corporations based in Shenzen, have emerged among the top five international corporations by their volume of patents application. These facts show a rapid shift in the world of creative invention. The Chinese authorities understand how national power must be closely linked in policies that tighten the gap in R & D. By encouraging the development of high-tech industries, China is not only strengthening its economy, but also to increase its influence in the world. In a global economy, innovation is a distinguishing feature of the power of a country.[22]

During the past decade, China has sought to adapt its industrial strategy to position itself vis-à-vis the arrival of the third industrial revolution. This revolution, based on intelligent manufacturing, will change even more the economic conditions of the world that have done the first two revolutions based on steam and then electricity. Already in 2006, China launched 17 mega projects in areas as diverse as generic chips, nanotechnology, developmental biology, aeronautics and exploration of the Moon. In addition, China adopted in 2011 a five-year plan of two trillion dollars to be spent on clean energy-related strategic industries, information technology, biotechnology, manufacturing new materials.[23] In order to stimulate innovation, China did attempt to attract ten scientific superstars in its research laboratories by offering 23 million in annual award to Nobel laureates and other luminaries if they accepted to move to China. This initiative was aimed to improve the quality and prestige of scientific research in China.[24]

Undoubtedly, China has become more active in terms of R & D. If it invested 1.6% of its GDP on R & D in 2010, China was planning to increase that percentage to 2.5% in 2020. In addition, it has a monetary reserve of more than $ 3 trillion. As it had the means to achieve its ambitions, China wants to become a serious competitor for the United States in R & D. Moreover, it is already training more engineers and scientists than the

United States and is currently building hundreds of new universities. R & D has become a driving force of China's economy and Beijing has made great efforts to promote a wide range of strategic industries in new technology sectors. In order to develop an entrepreneurial culture in innovation, Beijing has created think tanks, research parks and incubators of research where policy makers, entrepreneurs, scientists, academics and managers of public companies come together and exchange ideas.[25]

With hundreds of billions of dollars annually invest to upgrade its technology since 2009, the question arises when China will overtake the United States in terms of innovation. But innovation means more than just invention. It requires an ability to translate original ideas into products and efficient services to meet the market demands. To do this, one need more than making major breakthroughs in laboratories. It takes more than technical competence. It also requires an ability to grasp complex market needs and adopt a marketing strategy accordingly. This calls for flexible and enterprising business leaders who are able to adapt quickly to demands of world market. But Chinese companies are still very few to be able to venture beyond the borders of China. In addition, China's largest enterprises are state owned companies which are rather slow and less effective in adjusting to technological change. And yet, China must first put an end to his political favoritism that is deeply rooted in its major industries. Despite some progress, China has a lot of work to do to stand out in terms of innovation and high technology.[26]

In 2010, China spent 141 billion dollars on R & D, while the United States invested 395 billion. However, the gap between the two countries is rapidly closing, as China spent 284 billion dollars in 2012. Still, research goes much further than simply having more trained engineers who applied for patents. To build a truly innovative economy, one country must develop an entrepreneurial culture based on transparency, the free flow of ideas and interdisciplinary research that encourages teamwork and helps to identify new markets and meet consumer demand. However, China suffers from several deficiencies in this regard. For catching up technologically, China has developed in the last thirty years an addiction to foreign technology that brought Chinese scientists to copy rather than to boldly innovate. Moreover, the freedom of action of Chinese scientists is hampered by censorship and government controls that seek to counter dissidents. No innovative culture can only develop under a system of strict control of information. In sharp contrast, the American culture is based on social and cultural institutions that allow ideas to move from the lab to the market.[27]

One must take into account other cultural factors which influence the adoption of an innovation by a society at large. For example, the practical road between the invention of the light bulb by Thomas Edison and the development of a large system of distribution of electricity to millions of people is a complex phenomenon. In the process, such diverse factors as “Politics, personalities, money, commercial demand, the dominance of an

existing design, religious traditions and luck all play a part in an invention's widespread acceptance by users".[28]

If China stood out for an export economy based on labor cheap, now it looks at the opposite side. Today, the Chinese middle class looks for high-paying jobs. As a result, the Chine authorities are seeking to create an entrepreneurial class based on venture capital. This new trend reveals how China is preparing to face the new challenges of globalization. In this economic transition, China attempts to position itself as an innovative nation. As a result, the Chinese government is investing year after year tens of billions of dollars in scientific research and is granting tax breaks and subsidies to technology companies as a way to accelerate the transition to a modern economy based on high technology industries. There lies the greatest threat for American competitiveness.[29]

The ownership of intellectual property

Export of high-tech products to China is still subject to severe restrictions from the American government. These restrictions represent significant barriers to the development of Sino-US trade. For example, American laws forbid since 1999 to export, reexport, or transfer equipment or expertise relating to satellite technology to China. These regulations applied also for other sophisticated technologies such as aircraft engines, lasers, telecommunication products, and aircraft materials. These American restrictions are imposed mainly on issues of cyber security and protection of intellectual property. But they imposed also for purposes of national security because some components could have military applications. In addition, the United States are concerned that China could share these technologies with countries such as Syria and Iran. In doing so, the United States are depriving themselves of a huge potential market for American exports of high technology. Consequently, Barack Obama has removed several regulations restricting exports of high technology from the Cold War.[30] Clearly, the export of high technology products would significantly reduce the trade deficit with China.[31]

Hacking in China has become a sort of national industry[32]. In 2010, the Supreme Court of China revealed that 41,000 complaints were filed, 10,000 more than the previous year, for copyright infringement. Indeed, a walk through any busy street in Shanghai reveals counterfeit DVDs, watches, handbags and clothing from prestigious brands. The shops selling counterfeit products have a storefront on main streets are ignored by occasional raids by the Chinese authorities. But for the United States, which is the most important thing is not piracy of Hollywood movies, but quotes from high-tech.[33]

There were no patent laws in China before 1985. All patents filed outside of China in the prior to that date are therefore not valid in the country because the Chinese law required that a patent to be valid must also be filed in China. Therefore, Chinese

companies are free to develop products by using foreign technologies prior to 1985 without obtaining a license. A Chinese company could legally and freely use patents that have not been registered and deposited in China. For example, Apple filed 300 on his iPhone in China, but China has published only 19. This means that if the products by Chinese companies could not be exported, this practice allows China to meet not only the need of its domestic market, but also to export these products to the rest of the world except in North America and Europe. In addition, companies can create new products by combining technologies from different sources. In this sense, China is in the eyes of the United States the worst offender by adopting the American system to beat the United States at their own game.[34]

Patents are intended to protect the pharmaceutical and biomedical products, technologies and industrial equipment, and advanced materials. In a world where technology is changing rapidly, patents represent protections for companies that have managed to bring to market a new product. But the authorities in Washington estimate that the American economy is losing annually more than 300 billion dollars from piracy and counterfeiting of American products. China would be primarily responsible for the theft. The authors of inventions are thus stripped of significant revenue by foreign companies who do not buy licenses for manufacturing goods or rendering the services requested. These illegal practices are such that the cause important damage to the American economy. That's why there so many complaints and lawsuits from Silicon Valley by large companies such as Microsoft, Hewlett-Packard, IBM and Oracle. Preservation of Industrial Property is thus a key element in maintaining the technological dominance of the United States vis-à-vis China.[35]

It is difficult to overstate the negative consequence of the infringement of intellectual property on the American economy. A study by the US Department of Commerce estimates that 27 million high-tech jobs, representing 19% of the American workforce, are directly threatened by piracy, industrial espionage and counterfeiting. In 2010, the director of the US Cyber Command said that copyrights, patents and license fees were worth five trillion dollars. There are a thousand different ways to steal intellectual property: Reproduction of information on hard drives, illegal sharing of information by employees who leave the company, products that are dissected and redesigned before being sold without royalties, piracy digital products, tapping of telephone conversations to obtain trade secrets, etc. The theft of intellectual property represents a kind of direct subsidy that allows a company it to save costs in the development of new technologies.[36]

For American companies which hope to succeed in China, protection of their technology represents a major challenge. Weak legal protection is a major obstacle. They must above all avoid of entering into partnerships with Chinese companies or to appeal to Chinese companies as subcontractors. Because for many American companies, the real

threat does not lie in an inability to penetrate the Chinese market, but rather how a Chinese company will use the technology of the American company and afterward come and compete with it in the American market. Then the price of an adventure in China can be very high for an American company. Even the viability of the said company to be in danger. In this sense, with these rules, an American company that has good technology should think twice before deciding to move to China.[37]

In 2005, the American company AMSC entered into partnership with the Chinese company Sinovel to produce wind systems. While Sinovel would produce turbines, its American partner providing control technology of high range. The two companies had signed a multi-year contract of 700 million dollars. The partnership promises to be beneficial to both companies. While AMSC provided components with high added value, Sinovel covered the manufacture of items at low cost. But Sinovel decided to short-cut the process and to develop its own technology by stealing the one of her partner. To do this, Sinovel has used a disgruntled engineer who worked at a research center of AMSC in Austria. Sinovel invited the engineer in Beijing and provides him with an apartment and female company. In addition, Sinovel awards him $ 1.5 million in return from the AMSC codes. Sinovel was thus able to reproduce the sophisticated technology of AMSC and to create a subsidiary to replace AMSC as a partner. As a result, AMSC had lost two thirds of its sales in June 2013 and its shares fell 90%. The American company has been compelled to lay off 60% of its workforce.[38]

Since China did represent for years the main focus of violations of intellectual property rights, the actions of the American government were until recently mostly shy. American authorities believe that China is responsible for 70% of crimes in this area. Although China has developed legal mechanisms to protect its own intellectual property, there are still legal weaknesses concerning the protection of intellectual property of foreign origins. Consequently, the high tenor of the Obama administration does not hesitate at each meeting with senior Chinese leaders to address the issue urgently. Moreover, the United States Department of Justice has increased the number of lawsuits against Chinese companies for infringement of intellectual property. The United States no longer want to replicate a new Sinovel experiment. As China wants to develop its own high-tech, it needs to acknowledge the issue. The problem is even more important that the United States has entered a new knowledge revolution.[39]

American representations led the Chinese authorities to adopt new laws to protect intellectual property and copyrights. China also adopted in 2012 six important laws to protect intellectual property, copyrights and patents improving civil procedure litigation. Despite this, there is still a great lack of consistency between different levels of government as local authorities are reluctant to implement the directives of the central government. In addition, during prosecution, Chinese courts tend to choose the most obvious cases for quick results in their campaign against hacking and counterfeiting.[40]

However, the Chinese authorities are making real efforts to ensure the protection of intellectual property through their judicial system. In 2012, Chinese courts handled 87,419 complaints of violations of copyrights and patents, an increase of 46% compared to 2011 and 113% compared to 2010. In 2012, the Supreme Court China has established 83 intermediate courts only to deal with disputes over patents. Chinese courts have paid particular attention to the protection of intellectual property by treating 13,104 criminal cases and holding more than 60,000 defendants in custody. Thus, 80% related to intellectual property cases were tried by Chinese courts in 2012 The particular reason for this significant increase in repression against counterfeiting from the fact that China also needs to protect its own intellectual property. [41]

China must also take into account that not only foreign firms are increasingly complaining in Chinese courts, but many of them have also become reluctant to move to China for fear of having their pirated products. So they fear that their Chinese competitors will monopolize not only the Chinese market, but also their own domestic market. But equally important is the growing presence of Chinese firms worldwide. Now these Chinese companies want to protect their intellectual property. On top of that, the Chinese authorities have learned from the success of the company Huawei whose effectiveness is based on globally recognized innovation. Certainly, China has begun to take the protection of intellectual property very seriously.[42]

The new economic challenges for China

China has entered a new phase in its industrial transformation. Although the country may have become the world's workshop, the nature of employment is rapidly changing. The climate in Chinese factories is no longer the same as it did 20 years ago. As Chinese workers are more educated, they now refuse to work in workshops at low wages. In many factories operating on low technology, employers are unable to find enough workers to produce their goods. Workers require both higher wages and better working conditions. In many cases, companies, looking for low-wage workers, chose to leave China to nestle in a new and more suitable location. Meanwhile, Chinese corporations are seeking to convert their production by using high technology. Indeed, China faces the same problem as the United States did a generation ago.[43]

Following the 2008 recession, American companies operating in China are paying much more attention to the different costs of production: wages, the supply chain, the rise of the yuan, transportation costs, delays caused by long distances, the quality of products, the ability to maintain minimum inventory, and the ability to respond quickly to problems of logistics. Now all these aspects come into consideration by American companies in their decision to implement a new plant in China or in the United States. American companies have a better understanding of their diffident costs. For most

companies, the delivery time and product quality have priority over wages in their decision.[44]

It is clear that industries which depended on large unskilled labor force, such as textiles, are unlikely to return to the United States. When they leave China, they tend instead to settle in Indonesia, Bangladesh or India. However, plants that are more automated their production systems tend to locate in the United States, if only to reduce transportation costs. A new trend appears on the horizon. Companies involved in industries as diverse as plastics, rubber, automotive, machinery, electrical equipment, computers and electronics repatriate their production from China or Europe to open new factories in the United States. Such is the case of GE, which transfer production to Louisville, Kentucky and Caterpillar, which opened a new factory employing 1,400 workers in Athens, Georgia. For these companies, using high technology, wages become less important factor than the choice of site for the new plants. Caterpillar announced in 2012 the opening of several new plants in the United States to meet local demand. Meanwhile, the American workers agreed to concessions in their new collective agreements to encourage companies to remain in the United States. The restructuring of the auto industry is a good example. Repatriating production in the United States, American companies are able to reduce by 30% their structural costs while they succeed to manufacture and ship faster their goods.[45]

Between 2009 and 2012 the United States has repatriated production of 50,000 manufacturing jobs. The high oil prices and transportation costs make it more expensive to ship goods around the world. The company Suarez was one of the first to choose in 2010 to relocate its facilities in China heating systems and vacuum cleaners old Hoover plant in North Carolina. The Ford Motor Company for its production of engines repatriated from Spain to Brook Park and the production of heavy trucks from Mexico to Avon Lake, two towns in Ohio. Certainly, the financial benefits for a company to manufacture their products in China or other countries diminished quickly. Wages are no longer the most important aspect to consider. Companies must also take into account the cost of shipping, energy, quality control and the protection of intellectual property.[46]

Again in 2006, the difference in wages between an American worker and a Chinese worker was $ 17. But in 2013, the gap was reduced to $ 7. A survey by the Boston Consulting Group in February 2012 revealed that 37% of American manufacturers based in China planned to shift some of their production to the United States. Several foreign multinationals do the same. Between 2010 and 2013, 520,000 new jobs were created manufactured in the United States, including 50,000 have been made by foreign companies. Even foreign companies are doing the same. IKEA opened a new furniture factory in Danville, Virginia, while Airbus is investing 600 million dollars in a plant in Mobile, Alabama. Samsung plans to invest 20 billion dollars in the United States. Michelin opens a new tire plant in South Carolina. Volkswagen did the same in Chatanooga,

Tennessee. One reason for this trend is due to lower energy costs in the United States related to the abundance of shale gas. Even more. The company Lenovo, a Chinese computer maker, chose in January 2013 to open an assembly plant in Whitsett, North Carolina to produce PCs, tablets, desktops and servers. Lenovo justified its decision as a way to give more flexibility in the assembly of components and to ship products faster.[47]

While changes in the American economy make it more attractive to maintain the production of American companies in the United States, it is becoming increasingly difficult to do business in China. With the one-child policy, China sees its population aging. Moreover, if wages in the United States have stagnated with the economic recession, in China they are increasing by 15-20% per year. In addition, American workers are more flexible and have waived expensive benefits. Moreover, the value of the yuan did increase by more than 30% against the dollar since 2005. There is no question of course to see the return of cheap manual labor in the United States. But American society has entered a phase of his greatest innovation in its history. The development of new technologies is progressing at an exponential rate. High technology promises to lead to substantial savings in productivity through new production processes. However, research has become the key new modes of production.[48]

Toward the third industrial revolution

Since the 2008 financial crisis, Americans have increasingly questioned themselves as to when China will overtake the United States as the world's largest economy and what consequences this fact will have on the current arrangement of international institutions. However, it is not certain that, if China becomes soon the largest economy in the world, it will seek to fundamentally alter the functioning of international institutions. Indeed, if the leadership has advantages, it also comes with responsibilities. But so far, China has been up to now reluctant to assume a predominant role on the world scene, preferring to adopt an attitude of inaction and of non-intervention. Indeed, China often prefers policy of slow changes to sudden changes.[49]

During the Asian financial crisis of the 1990s, the IMF and the World Bank, under the leadership of the United States, have imposed stricter conditions on countries in financial trouble. Now the United States are somewhat in the position of Asian countries in the 1990s or Great Britain during the Suez crisis in 1956. While China has become the largest donor, the question is whether or not Beijing is willing to impose on Americans as humiliating terms they have done for other countries? The issue is an important one. But everyone will notice quickly that the United States is still far from being the last gasp of a declining power. China is not yet able to replace the United States as a global economic leader. American power has many assets to recover. At best, China can hope to share the world stage with the United States.[50]

We must avoid being drowned out by statistics. Currently the United States is in a bottleneck financial strangulation. But they have the ability to reverse the trend. During the late 1990s, they were in the process of eliminating their debt. But the situation has changed since 2001 as a result of tax cuts from the Bush administration, the two long wars in the Middle East and the financial crisis of 2008. Between 2008 and 2011, the United States has experienced a marked slump by decreased incomes for the middle class, lower social mobility, increased social inequalities, and decreased opportunities for young people graduating from universities. But with the economic recovery, albeit slow, the situation is gradually stabilizing. Moreover, the issue of public debt had become under control with the recovery of the labor market. Meanwhile, American society offers unique opportunities for entrepreneurship with its pro-business culture, business partnerships, universities, political management of venture capital and its open immigration policy.[51]

The American industry is undergoing profound changes. In 1980, the manufacturing process was dominated by large companies such as DuPont, IBM and Kodak which managed all aspects of their production. Today, the American manufacturing sector is composed of small companies that work in partnership with other companies, research laboratories and academic centers with which they share common facilities, expensive equipment and training programs. Across the United States, similar networks are put into place. The Obama administration has given a billion dollars to support the creation of similar technology parks. Innovation has become the key to the success of new businesses. Research became the main source of expenditure for these companies. Manufacturing production in the United States does include numerical models in the process of making goods and various products. But in American manufacturing, high technology using artificial intelligence, robotics, nanotechnology and 3D printing are growing exponentially. The United States is creating robotics with a new set of industries and professions. In this context, it is no longer necessary to ship raw materials or parts in China for assembling them into finished products before returning goods to the United States.[52]

The new production in the United States allow American businesses to achieve superior quality control and to make better products that the ones coming out from low cost assembly from China or India. These new smart technologies involve lasers, alloys of new materials, computerized databases and information technology through cloud to reduce costs and to speed up delivery. No longer stifled by union rules, American companies located in the United States benefit from favorable environment in the use the latest innovations in manufacturing technology. In this sense, the idea of increasing its profit by using a cheap labor has become outdated.[53]

Americans generally tend to overestimate the capacity and strength of their rivals. In the late 1950s, in the wake of Sputnik and the declaration of Nikita Khrushchev's ability to bury the Soviet Union within a decade the United States, Americans knew the Missile

Gap. Yet it is the United States that would win the race. During the 1970s, when the Soviet Union got bogged down in corruption and inefficiency, the United States still believed that she was in a race to catch up. During the 1980s, following the 1982 financial crisis, Americans believed that Japan would soon overtake the United States economically. Yet the Japanese economy collapsed in 1991 following a speculative madness and political corruption. Today, as the Americans put the Chinese economy at the zenith, we must ask ourselves whether or not China, with its bad loans, the housing bubble, the continuing economic slowdown, political scandals and a glut of housing unsold, did not suffer from the same disease than the Soviet Union in the 1970s and Japan in the 1980s.[54]

The Chinese authorities are well aware of the existing disparity between China and the United States in terms of economic, cultural, political and military power. Also, if China wants to position itself as a regional military power, it must first strengthen its bilateral relations with the United States. In this sense, Beijing still prefers to enjoy security and maintaining the status quo provided by American power in the Asia-Pacific region than trying to change the strategic balance in Asia in its favor. Moreover, despite periodic tensions over territorial waters of the South China Sea, China maintains good neighborly relations with most countries in the region. The situation remains very manageable. A Chinese challenge to American dominance, even in East Asia is not for tomorrow.[55]

The American ability to bounce back

The perception that the United States are declining generated a gloom atmosphere among some Americans. The latter react very emotionally to the idea, as if they believed that the United States are destined to keep always a prominent place on the world scene. For them, even a relative decline in the American power is seen as a sign of decadence. But we must acknowledge that a relative decline is in part of the logical evolution of the global economy where new countries are becoming more prosperous. Yes, the United States are experiencing a relative decline and they are facing some major issues such as debt, the failures of secondary education or the lack of political compromise. However, the positives outnumber the negatives. In this sense, the greatest handicap for the United States stems perhaps from the own perception of Americans on their society. By insisting too much on American decline, there is a risk of wanting to give up everything and to adopt an attitude that will make the prophecy becoming true.[56]

Militarily and politically, the United States are not in decline. The international order is still governed by American power. But the financial, economic and cultural level, there is a shift of the center of gravity of the world. A new world is emerging. After having launched the process of globalization, the United States are hit by a return of the ball. As

the world continues to grow, the United States have lost key industries which resulted in job losses and unemployment. However, Americans do also benefit from globalization with low inflation and stable prices. Moreover, the United States still remain the most competitive economy in the world as American corporations take the lead in the transition toward manufacturing intelligence. They do also dominate the leading sectors in high technology such as nanotechnology and biotechnology.[57]

To place the debate in a broader perspective, the United States has a huge competitive advantage. They represent the most open and most flexible society in the world. American society is able more than any other countries to integrate people, ideas, cultural values from other societies in an atmosphere of tolerance. When compared to the United States, most other societies appear to be more hierarchical and less open minded. Therefore, American society, more than any nation, can easily adapt to the new world that is emerging. In terms of geopolitics, Washington will inevitably lose some of its international dominance as the rest of the word become more prosperous. But geopolitics is also a game of influence. The American model is an asset that the Washington can use to tis own advantage. Paradoxically, as in American power appears to be diminishing, the United States are better off because the rest of the world is embracing the American model and is adhering to a market economy, while it respect ore human rights and do adopt American technology.[58]

To determine whether or not a country is in decline, one must also look at its investment policy in innovative technology. Economists have long found that a country is able to maintain its competitiveness and ensure its economic progress by investing in human capital and innovation. Whatever where you look at, the United States still rank in the top five countries in terms of percentage of GDP invested in research, the number of scientists and engineers per 1,000 population, the number of patents filed per 1,000 people and the number of new innovative businesses. Therefore, on the technology front, an eclipse of the United States by China appears out of question. Moreover, all the BRICS countries fall far behind the United States in the analysis of the four criteria mentioned above.[59]

Critics of American society whom assert that the United States are losing its competitive edge forget another important fact. American society is still the dominant power in science and technology in the world. More than a third of all expenditures for scientific research in the world are made in the United States. In addition, the United States have 30 of the 40 best universities in the world and do employ 70% of Nobel laureates. No country in the world is able to attract as many foreign students in science and engineering as do the United States. Moreover, many of these students then remain in the United States and help to maintain scientific and technological advantage of American society over other nations. In this sense, the perception that the United States

are losing its competitive edge as a world leader in science and technology is unfounded.[60]

Nevertheless, the United States should not be lulled into complacency about their own situation. In Europe, Japan and China, people are investing heavily in science and technology. American authorities need to closely monitor the situation and to take appropriate solutions in order to maintain the American competitive advantage. For example, 70% of foreign students who get a doctorate in science and engineering at an American university do pursue afterward a career in the United States. This migration intake was a key factor by which the American society does achieve a technological advancement over other countries. But this competitive advantage could fall apart if these students were able to get better working conditions in their home country. Furthermore, any reduction of the government scientific contribution could force American corporations to outsource their own research abroad or to establish their facilities in other countries. Such a situation would provoke a loss of jobs in the United States.[61]

Therefore, it is imperative for the American government to take appropriate measures to maintain this competitive advantage. To do it, it need to :

- Provide ongoing funding research organizations;
- Monitor and analyze the performance of scientific research and technology in the United States and worldwide;
- Make it easier for foreign students who graduated at an American university in science and engineering to obtain permanent residence in the United States;
- Facilitate immigration to the United States for highly skilled foreign workers;
- Carefully follow the evolution of scientific research centers in Europe, Japan, China, India and other countries;
- Improve training in science and technology of American high school students.[62]

Ultimately, innovation is the cornerstone of the whole edifice. Innovation not only determines the competitiveness of an economy, but it is also a key factor in the establishment of the military and political ascendancy of a country. To know whether or not China will become the first military power in the world in 30 or 40 years, one must determine whether or not look that country is able to become the world leader in technology. At this level, the United States has a long advantage over China. Not only American culture is more opened to innovation, but it is also more inclusive. Here, the case of the Soviet Union is a good example, After growing at a rate of 6% per year from 1928 to 1960, the Soviet economy then began to stagnate, while the American economy continued on its momentum. China is likely to suffer a similar, unless major reforms are introduced in its economic and political system.[63]

Finally, the United States must remain aware of the challenges represented by Chinese innovation and other predatory policies. One way of meeting Chinese challenge is to work closely with Japan and European countries. The creation of a united front to

fight cyber espionage could be a way of countering Chine hacking networks. Moreover, the United States must remain aware also of the rise of new scientific power such as Brazil and India. In doing so, America could preserve its scientific dominance, despite de fact that scientific capabilities are becoming more available worldwide. “American society, with its vibrant technology sector, dynamic research universities, and large population of immigrant scientists and entrepreneurs, is well positioned to tap into these new sources of discovery.”[64]

Conclusion

Despite the rise of China, several close observers of the world situation have noted that Chinese society does show more signs of major weaknesses that would prevent China to challenge the global hegemony in the United States. Let us examine briefly ten of these factors:

- First, much of this production in China is still owned by foreign companies, including U.S. firms;
- Second, the United States have entered a period of economic transition preparing the third major phase of the industrial revolution based on intelligent manufacturing and the creation of business-university partnerships;
- Third, the United States have the best higher education system in the world;
- Fourth, the United States have not only considerable scientific and technological lead over China, but they also invest each year twice as much as the latter in technological innovation;
- Fifth, China will soon become the largest consumer of oil in the world. But while the United States will become energy self-sufficient, China will have to import more than $ 500 billion of oil per year;
- Sixth, more than the United States, China is feeling the adverse effects of climate change and pollution. Beijing needs to invest heavily to correct these environmental problems;
- Seventh, social tensions and political dissent represent a bottleneck that forces Chinese authorities to devote their energies to solve internal problems;
- Eighth, the endemic corruption that marks the company and China's political system also brings Chinese leaders to focus their attention also on domestic issues;
- Ninth, the United States, although they have a lead in military technology combined exceeding those of the ten largest military powers that follow, including China, continue to invest obviously in their defense;

- And tenth, the United States have extensive networks of alliances, including East Asia, to ensure regional security. In return, several neighbors of China look with apprehension at the growing Chinese power.[65]

Other constraints also hinder R & D in China. In universities, a fierce competition for career advancement researchers has led to cases of plagiarism and corruption. Moreover, fear or intolerance of failure, especially in the large state sectors, tend to discourage risk-taking imagination, while the suppression of political dissent and an education system heavily based on learning by heart hardly encourage original thinking and creativity. Innovation does involve much more than invention. It requires the ability to translate laboratory breakthroughs into successful products and services that appeal to the market demand. This, in turn, means using a much larger and more complex skills and abilities that technical competence right combination. If the American society has developed these skills, Chine society has still a long road to pursue before achieving a similar success.[66]

Notes

[1] "Obama stresses economic roles with China's expected new leader", *CNN*, February 14, 2012; Josef Joffe, *The Myth of America's Decline, Politics, Economics, and a Half Century of False Prophecies*, New York, W. W. Norton, 2014, p. 131; Jason Miks, "China's Economy as No. 2?", *The Diplomat*, August 2, 2010.

[2] Edward Friedman, "Will 21st Century Be China's?", *The Diplomat*, November 19, 2011; Martin Jacques, *When China Rules the World: The End of the Western World and the Birth of a New Global Order*, Second Edition, London, Penguin Books, 2012, p. 524-25; Christopher Layne, "China's Challenge to US Hegemony", *Current History*, January 2008, p. 13-18; Barbara Onnis, "Has China Plans for World Domination?", *Comparative Civilizations Review*, vol. 68, Spring 2013, p. 55-73; Chit Romana, "Does China Want to Be Top Superpower?", *ABC News*, March 2, 2010; Arvind Subramanian, "The Inevitable Superpower: Why China's Dominance Is a Sure Thing", *Foreign Affairs*, August 23, 2011.

[3] Guy de Jonquières, "Why China isn't an innovation powerhouse", *CNN*, October 24, 2013. Juro Osawa and Paul Mozur, "The Rise of China's Innovation Machine", *The Wall Street Journal*, January 16, 2014; Peter J. Williamson and Eden Yin, "Accelerated Innovation: The New Challenge From China", *MITSlaon*, April 23, 2014; Xu Xiaonian, "U.S. Competitiveness and the Chinese Challenge", *The Harvard Business Review*, March 2012.

[4] Xu Xiaonian, op. cit.

[5] Xu Xiaonian, op. cit.

[6] Eric Kennedy, "China's National Innovation System: Learning from a Holistic, National Approach", *The Breakthrough*, January 16, 2013.

[7] Michael Barris, "China's innovation challenge", *The China Daily USA*, March 14, 2014; Dieter Ernst, "China's Innovation Policy is a Wake-up Call for America, Not a Threat", *The East-West Center*, March 11, 2011.

[8] Guy de Jonquières, "Why China isn't…", op. cit.; Simon Hansen, "Imitation to innovation: the strategic implications of China's R&D trends", *The Strategist*, March 11, 2014.

[9] Eric Kennedy, op. cit.

[10] Dieter Ernst, op. cit.; Simon Hansen, op. cit.; Adam Segal, "The challenge of China as a science and technology superpower", *The Guardian*, October 11, 2013.

[11] Dieter Ernst, op. cit.; Simon Hansen, op. cit.; Adam Segal, "The challenge of China…", op. cit.

[12] Serena Dai, "China and India Are Catching Up to the U.S. in College Graduates", *The Atlantic Monthly*, August 22, 2012; Marcella Kreiter, "Education: U.S. education system slipping behind China, India", *United Press International*, August 26, 2012; Matt James et Neera Tanden, " U.S. Education Must Keep up With China's, India's Bold Programs", *U.S. News & World Report*, August 22, 2012; Josef Joffe, op. cit., p. 173-73; Robyn Meredith, *The Elephant and the Dragon, the Rise of India and China ad What it Means for all of US*, W. W. Norton, New York, p. 72-73; Jiang Xueqin, "Internationalizing Education", *The Diplomat*, June 1, 2011.

[13] Jiang Xueqin, op. cit.

[14] Serena Dai, op. cit.; Marcella Kreiter, op. cit.; Matt James et Neera Tanden, op. cit.; Josef Joffe, op. cit., p. 173; Robyn Meredith, op. cit,. p. 72-73; Jiang Xueqin, op. cit..

[15] For example, Steve Jobs could invent Apple and the iPhone because he lived and worked in the American culture which encouraged, promoted and rewarded innovation. He was able to learn from his first failures. Michael Barris, op. cit.; Gary Shapiro, "Is True Innovation Within China's Reach?" *AmCham*, June 4, 2014; Chi-Chi Zhang, "China faces hurdles amid quest for a Nobel", *NBCnews*, October 6, 2010.

[16] Michael Barris, op. cit.; Gary Shapiro, op. cit.

[17] Michael Barris, op. cit.; Gary Shapiro, op. cit.

[18] Michael Barris, op. cit.; A major problem in China came from the fact that promising researchers are taking out of laboratory to be promoted in high offices in government. Such was the case of Zhong Nanshan, a leading expert in respiratory, who helped to identify and contain the epidemic outbreak of SARS in 2003. Chi-Chi Zhang, op. cit..

[19] Thomas Barlow, "How China's know-how is challenging the US", The Age, December 30, 2013; Michael Barris, op. cit.; Chi-Chi Zhang, op. cit.

[20] Michael Barris, op. cit.; Gary Shapiro, op. cit.

[21] John Reed, op. cit.; Gary Shapiro, op. cit.; Lan Xue and Denis Simon, "U.S.-China Science and Technology Cooperation", *China-United States Exchange Foundation*, May 21, 2013, p. 17-19; Jiang Xueqin, "How China Kills Creativity", *The Diplomat*, July 2, 2011.

[22] Thomas Barlow, op. cit.; Simon Hansen, op. cit.

[23] Guy de Jonquières, "Who's Afraid of China's High-Tech Challenge?" *ECIPE Policy Briefs*, no 7, 2013, p. 1-7; Guy de Jonquières, " Why China isn't…", op. cit.; Zhang Monan, "New industrial revolution", *The China Daily*, September 5, 2012; Paul Mozur and Eva Dou, "Robots May Revolutionize China's Electronics Manufacturing", *The Wall Street Journal*, September 24, 2013; Adam Segal, "The challenge of China…", op. cit.; Lan Xue and Denis Simon, op. cit., p. 11-13.

[24] For example, the Chinese authorities have launched a program to attract a thousand foreign professors into Chinese universities by granting them an annual salary of 160 000 dollars and research grants from 500 000 to 8000 dollars a year. The program is aimed to make Chinese universities more competitive. Liz Gooch, "Chinese Universities Send Big Signals to Foreigners", *The New York Times*, March 11, 2012.

[25] Guy de Jonquières, "Who's Afraid of China's…", op. cit., p. 1-7; John Kao, "China as an innovation nation", *CNN*, September 12, 2011; John Reed, "China Caught the U.S. in Manufacturing, High-Tech Weapons Might Be Next", *defensetech.org*, June 29, 2012; Adam Segal, "Why American innovation will beat out China's", *CNN*, March10, 2011; Lan Xue and Denis Simon, op. cit. p. 8-13.

[26] Guy de Jonbquières, "Who's Afraid of China'…", op. cit., p. 6-7; Guy de Jonquières, "Why China isn't…", op. cit.; Josef Joffe, op. cit., p. 188-92.

[27] Guy de Jonquières, "Why China isn't…", op. cit.; Josef Joffe, op. cit., p. 182-85; Adam Segal, "Why American innovation…", op. cit.; Lan Xue and Denis Simon, op. cit., p. 18-22.

[28] Michael Barris, op. cit.

[29] John Horn, Vivien Singer and Jonathan Woetzel, "A truer picture of China's export machine", *The McKinsey Quarterly*, September 2010; Vijay V. Vaitheeswaran, "China's rise doesn't have to come at America's expense", *CNN*, March 20, 2012.

[30] "China Criticizes U.S. Government Curbs on Foreign Technology Purchases", *The New York Times*, January 19, 2014; Cornelia Dean and William J. Broad, "Obama Is Urged to Open High-Tech Exports", *The New York Times*, January 8, 2009; Wayne M. Morrison, "China-U.S. Trade

Issue", *Congressional Research Service* 7-5700, RL33536, July 17, 2013, p. 35-36; Didi Kirsten Tatlow, "Protecting American High-End Research as China Rises", *The New York Times*, June 12, 2013; Steven R. Weisman, "Eased Rules on Tech Sales to China Questioned", *The New York Times*, January 2, 2008.

[31] For example, China received in 2011 one billion dollars in royalties on patents that it has issued, but it was paying 18 billion dollars to foreign countries for the right of using their patents. And these is only the point of iceberg. Guy de Jonquières, "Why China isn't…", op. cit.

[32] In January 2010, Google announced that Chinese hackers had infiltrated its system. Since the revelations about the hacking of American high-tech companies, financial institutions, corporations with defense contracts or university research centers are published almost daily. Adam Segal, "The challenge of China…", op. cit.

[33] Giles Chance, "Riding the crest of a boom in intellectual property rights", *The China Daily*, August 26, 2013; Peter Navarro, "China's Currency Manipulation: A Policy Debate", *The World Affairs Journal*, September/October 2012; Elliot Papageorgiou, "China's anti-piracy measures 'inconsistent', lawyer argues", *BBC*, April 26, 2011.

[34] Susan V. Lawrence, "U.S.-China Relations: An Overview of Policy Issues", *Congressional Research Service 7-5700*, R41108, August 1, 2013, p. 41; Edward J. Shao, " Intellectual Property Rights and Information Security", *China-United States Exchange Foundation*, May 21, 2013, p. 5, 9; Vivek Wadhwa, "China Could Game the U.S. in Intellectual Property", *Bloomberg*, January 10, 2011.

[35] "US report warns on China's massive intellectual property theft", *The Economic Times*, May 23, 2013; James Dyson, "China: The Intellectual-Property Battleground", *Bloomberg*, February 16, 2011; Wayne M. Morrison, "China-U.S. Trade Issue…", op. cit., p. 32; Peter Navarro, op. cit.; Robert G. Sutter, op. cit., p. 220-22;Vivek Wadhwa, op. cit.

[36] Wayne M. Morrison, "China-U.S. Trade Issue…", op. cit., p. 32-35; Edward J. Shao, op. cit., p. 9; Timothy Taylor, "U.S. Intellectual Property and China", *The conversable economist*, July 12, 2013.

[37] Wayne M. Morrison, "China-U.S. Trade Issue…", op. cit., p. 35-36; Jack Perkowski, "Protecting Intellectual Property Rights In China", *Forbes*, April 18, 2012; Timothy Taylor, op. cit.

[38] Melanie Hart, "Criminal Charges Mark New Phase in Bellwether U.S.-China Intellectual Property Dispute", *The Center for American Progress*, June 27, 2013.

[39] "US report warns on China's massive intellectual property theft", *The Economic Times*, May 23, 2013; James Dyson, op. cit.; Edward Friedman, "If China Sneezes…", *The Diplomat*, April 27,

2012; Melanie Hart, op. cit.; Matthew Pennington, “Biden welcomes China's rise but says Beijing's theft of US intellectual property must stop”, *The Star Tribune*, July 10, 2013.

[40] Giles Chance, op. cit.; Melanie Hart op. cit.; Elliot Papageorgiou, op. cit.; Edward J. Shao, op. cit., p. 9-12.

[41] Giles Chance, op. cit.; Melanie Hart, op. cit.

[42] The number of patent applications did increase in average of 16% per year from 171 000 since 2006. By 2015, the number of Chinese patent applications should reach 500 000, while it would be 480 000 in United States. Giles Chance, op. cit.; James Dyson, op. cit.; Melanie Hart, op. cit.; Jack Perkowski, op. cit.

[43] Stan Grant, “'Cheap China' era ends as factory workers wise up”, *CNN*, February 15, 2012.

[44] Philip LeBeau, “U.S. Manufacturing No More Expensive Than Outsourcing To China By 2015”, *The HuffPost Business*, April 19, 2013; Scott Malone and Ernest Scheyder, “Outsourcing Losing Its Allure As China Costs Soar”, *The HuffPost Business*, July 24, 2012; Elizabeth G. Olson, “Banging the drum to bring jobs back home”, *CNN*, July 22, 2011.

[45] Huo Jianguo, “The Development of U.S.-China Economic Relations, 1978 to the Present”, *China-United States Exchange Foundation*, May 21, 2013, p. 19-20; Scott Malone and Ernest Scheyder, op. cit.; Harold Meyerson, “Back from China?” *The American Prospect*, November 29, 2011; Brad Plumer, “Is U.S. manufacturing making a comeback — or is it just hype?” *The Washington Post*, May 1, 2013.

[46] Arthur Herman, “Jobs coming home”, *The New York Post*, July 18, 2012; Huo Jianguo, op. cit., p. 19-20; Robert Schoenberger, “Reshoring: Are manufacturing jobs coming back to United States?” *The Plain Dealer*, March 11, 2013.

[47] Huo Jianguo, op. cit., p. 19-20; Alan Mayer, “Strategies: U.S. companies are bringing back manufacturing jobs”, *The Business Journals*, June 9, 2013; Harold Meyerson, op. cit.; Brad Plumer, op. cit.

[48] Ten years ago, a American worker received a salary 25 time higher than a Chine worker. Today, the difference had been reduced to only a double. Arthur Herman, op. cit.; Alan Mayer, op. cit.; Harold Meyerson, op. cit.; Vivek Wadhwa, op. cit.

[49] Elizabeth C. Economy, “Can China be a World Leader?” *The Diplomat*, October 9, 2012; Martin Jacques, op. cit., p. 491-92; Josef Joffe, op. cit., p. 39-42, 69.

[50] Emmanuel Todd still argued in January 2014 that the United States was in decline and that a new world order is taking shape in which China holds a major place. Arvind Subramanian, op. cit.;

Emmanuel Todd, “The paradox of America's fading empire”, *Nikkei Asian Review*,16 janvier 2014.

[51] Arvind Subramanian, op. cit.

[52] Harold Meyerson, op. cit.; Art Pine, op. cit.; Brad Plumer, op. cit.; Vivek Wadhwa, op. cit.

[53] Arthur Herman, op. cit.; Alan Mayer, op. cit.; Harold Meyerson, op. cit.

[54] Guy de Jonquières, « Who’s Afraid of China…”, op. cit., p. 1-7; Josef Joffe, op. cit., p. 3-9, 18-24, 259; Minxin Pei, “Everything You Think You Know About China Is Wrong”, *The Foreign Policy*, August 29, 2012.

[55] Fran Shor, op. cit.

[56] Michael Moran, “The Future of U.S. Power: What Not to Take for Granted”, *The HuffPost*, April 9, 2012; David Wolf, “Joseph Nye on the Future of American Power”, *The Hutong*, February 13, 2011; Fareed Zakaria, “The Post-American World”, *Newsweek*, May 3, 2008.

[57] Josef Joffe, op. cit., p. 188-92; Fareed Zakaria, op. cit.

[58] Fareed Zakaria, op. cit.

[59] Guy de Jonquières, “Who’s Afraid…”, op. cit., p. 1-7; Richard Florida, op. cit.; Josef Joffe, op. cit., p. 192-94.

[60] China has no university ranked among the top 50 in the world and has only six universities in the top 200. “U.S. Still Leads the World in Science and Technology; Nation Benefits From Foreign Scientists, Engineers”, *RAND*, June 12, 2008; Martin Jacques, op. cit., p. 547; Josef Joffe, op. cit., p. 177; Fareed Zakaria, op. cit.

[61] « U.S. Still Leads the World… », op. cit.; Fareed Zakaria, op. cit.

[62] “U.S. Still Leads the World…”, op. cit.; Joseph S. Nye Jr., “American power in the 21st century will be defined by the ‘rise of the rest’”, *The Washington Post*, June 28, 2013.

[63] Daron Acemoglu and James A. Robinson, op. cit.; Guy de Jonquières, “Who’s Afraid…”, op. cit., p. 1-7; Josef Joffe, op. cit., p. 261-62; Joseph S. Nye Jr., “American power…”, op. cit.

[64] Adam Segal, “The challenge of China…”, op. cit.

[65] “3 reasons why China isn't overtaking the US”, *The Christian Science Monitor*, January 24, 2012; “8 reasons America is not in decline”, *The Christian Science Monitor*, March 6, 2012; Daron Acemoglu and James A. Robinson, “World's next technology leader will be US, not China – if America can shape up”, *The Christian Science Monitor*, April 19, 2012; Guy de Jonquières, “Who’s Afraid…”, op. cit., p. 1-7; Richard Florida, “The World’s Leading Nations for Innovation

and Technology", *The Atlantic Cities*, October 3, 2011; Joseph S. Nye, "China's Century is Not Yet upon Us", *Financial Times*, May 19, 2010; Fran Shor, "Declining U.S. Hegemony + Rising Chinese Power: A Formula for Conflict?" *State of Nature*, Summer 2011..

[66] Guy de Jonquières, "Why China isn't…", op. cit.