Short Term Policy Brief 81

China’s Industrial Policy

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Contents

Executive Summary ........................................................................................................................................... 4

Introduction ..................................................................................................................................................... 6

1. The origins of the Chinese industrial policy ......................................................................................... 8

2. China’s industrial policy after the opening up of the economy ....................................................... 10

3. The objectives of China’s industrial policy ......................................................................................... 12

   3.1 The political objectives of China’s industrial policy: domestic cohesion and strategic autonomy .......................................................................................................................... 13

   3.2 Rationalisation of production capacities ....................................................................................... 14

   3.3 The “Go global” policy: creating global competitors that can control international production networks and access strategic assets ................................................................................. 15

4. The weaknesses of China’s national champions ............................................................................... 22

   4.1 Overstaffing .................................................................................................................................. 22

   4.2 Low profitability ............................................................................................................................. 23

   4.3 Limited innovation capacities ...................................................................................................... 24

   4.4 Limited international management know-how ........................................................................... 27

   4.5 Branding gap ............................................................................................................................... 27

5. The promotion of “indigenous innovation” capacities ....................................................................... 28

6. The barriers raised by the Chinese authorities to protect national champions from foreign competitors .............................................................................................................................. 31

7. The impact of Chinese industrial policies on EU industries and possible reactions by the EU ........................................................................................................................................... 32

Tables
Table 1: Progress of Chinese firms in the Global 500 firms ........................................................................ 15

Table 2: Capital intensity of the global 500 (assets/ employees) .................................................................. 22

Table 3: Comparison of profit in the Fortune global 500, 2013 ................................................................ 23

Table 4: Comparison of Chinese firms and top R&D spending firms by sectors, 2010 ......................... 25
Figures
Figure 1: Chinese ODI flows, 1985-2012 ................................................................. 17
Figure 2: Chinese ODI stocks, 1985-2012 ............................................................... 17
Figure 3: Comparison of Chinese firms and European firms in R&D expenditure (% of GDP), 2004-2011........................................................................ 27
Executive Summary

- Foreign investors have recently expressed concern due to a series of negative media campaigns and government crackdowns on foreign multinational enterprises (MNEs) operating in China, notably GSK, Danone, Apple, Samsung and VW. Some analysts have questioned whether these events might reflect a shift toward more protectionism, as part of a broader industrial policy to foster the development of Chinese national champions.

- However, other motives may explain this stricter attitude of the Chinese authorities vis-à-vis MNEs, notably the need for the new leadership to reinforce both its popular support base and grip on the party in a period of economic slowdown through populist and nationalist economic policies. It might also reflect a willingness to reduce business-induced corruption in order to raise quality standards and reduce abuse of dominant position by large firms, whether foreign or Chinese.

- Chinese industrial policy goes back to Deng Xiaoping and its objectives have been relatively consistent over time. They are both political and economic and they have not been fundamentally modified by the change of leadership in China’s Communist Party (CCP).

- The Chinese leadership is trying to build national champions that possess intangible assets like innovation capacities or international management and branding know-how in order to resist competition from global MNEs. A second objective is for Chinese firms to control their own international production networks. This industrial policy also aims to rationalise production capacities and upgrade the technological level of the Chinese economy in order to avoid overcapacities and shift from an extensive to a more sustainable, intensive growth.

- To build these champions, the Chinese authorities are merging national firms, subsidising them and offering protection through various means: technical barriers such as administrative licensing and privileged or exclusive access to public procurement. These national champions maintain extremely close connections with the CCP leadership. These links also serve the political goals of the Chinese leaders, chief among them being to reinforce national political cohesion by creating a strong constituency against centrifugal forces in China.

- The Chinese authorities also support the expansion of national champions abroad. This is the so-called “go global” strategy, pursued through subsidies, guidance and tied aid programmes in developing countries. The internationalisation of large firms is closely monitored by the government, which can impose specific courses of action on them. The main goal of the CCP leadership is to secure access to raw materials and notably energy, but also to help Chinese champions to takeover strategic assets like innovation and marketing capacities.

- Thanks to this persistent support from the state, Chinese national champions have developed into global firms and have begun to internationalise their operations. Nevertheless, they remain less technologically advanced and less profitable than their
global competitors and are still mostly operating in their domestic market. At this stage, they still need government protection to survive against international competition.

- The Chinese leadership is also trying to reduce its dependence on foreign technology by developing a stronger scientific base and by developing alternative technical standards that it hopes to transform into global standards thanks to the size of China’s domestic market and active industrial policies (using public procurement, subsidies, technical barriers and tied aid programs). Nevertheless, despite the impressive developments of the last three decade, China’s scientific base is still far less advanced than that of Japan, the US, the UK or Germany. China still needs access to foreign technology, notably FDI from MNEs that account for a decisive share of China’s research and China’s high-tech exports.

- It is highly likely that the Chinese authorities will continue to pursue an active industrial policy throughout this decade. Currently the EU does not have the level of unity or the bargaining position (due to EU firms' need to access the Chinese market in a period of prolonged stagnation in Europe) to force China to scale down its protectionist policies. The social and political context in China will enable the CCP leadership to persist in its support of national champions.

- The upgrading of China's industries will have a differentiated impact across the EU. Less technologically advanced Member States will come under more direct pressure from Chinese competitors, but also from firms from some other emerging economies.

- In light of the above, the EU should continue to maintain its technological edge by investing a larger share of its GDP in R&D and by developing more supranational research projects. At this stage, the current tools and targets of the Lisbon and Europe 2020 strategies are insufficient to reach these goals.
Introduction

China's current industrial policy has been pursuing long term objectives and can be traced back to the late 1970s. The new CCP leadership under General Secretary Xi Jinping has not altered in any fundamental way these objectives. These are part of a long-term policy defined in the framework of the 11th and 12th Five-Year Plans and other long-term programmes for scientific and technological development.

Foreign investors have recently expressed concern due to negative media campaigns and government crackdowns on foreign multinational enterprises (MNEs) operating in China: the prosecution for bribery of GSK executives, fines imposed on Danone and five other MNEs under China's anti-monopoly regulations and shaming campaigns against GSK, VW, Samsung or Apple. At the same time, blatant privileged access to key PRC public procurements is granted to Chinese national champions, notably in the development of hundreds of thousands of 4G base stations. Moreover, Xi Jinping is explicitly rehabilitating Mao's legacy and CCP propaganda is encouraging virtuous and altruist behaviour, putting forward ideological icons from the 1960s.

There has been a lot of speculation over whether this represents a change in policy on the part of the Chinese leadership that will restrict the room for manoeuvre of foreign investors in order to give more space for the development of Chinese national champions (as countries like Japan or South Korea once did) or simply a temporary leftist turn to strengthen Xi Jinping's hold on the CCP before he can actually proceed with an agenda of further liberalisation of the economy, as previously forecast by some analysts. Contradictory analysis that is sometimes motivated by political agendas and limited reliable sources of information makes it difficult to interpret the recent actions of the new leadership. In the case of GSK, allegations that the government crackdown might be politically motivated have been circulating, but are difficult to assess rigorously. If one were to make an educated guess, the claim that the new CCP leadership is

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1 A $110m fine was imposed on six baby formula manufacturers, including the French company Danone, for anti-competitive pricing policies.
2 Two thirds of the 4G contract, worth Rmb20bn, was awarded to Chinese national telecoms champions like Huawei and ZTE while MNEs like Ericsson, NSN and Alcatel-Lucent each got 11% of the market; market shares had clearly been decided regardless of the economic performance of the bidders.
3 Such as the PLA propaganda hero Lei Feng.
4 The crackdown involved the targeting of the children of Hu Yaobang who allegedly criticised the new CCP leadership (Hu Yaobang’s daughter had been a director of GSK until 2007).
ramping up protectionism against MNEs as a way of promoting national champions is not very plausible, for three reasons.

Firstly, it is logical for the new leadership to adopt a so-called 'leftist' turn, whatever the personal background of Xi Jinping (who actually was a direct victim of the Cultural Revolution) or other leaders of the Politburo. The Chinese economy is experiencing a significant slowdown with just over 7% GDP growth forecast for this year, the lowest for more than a decade. The urban youth are facing rising unemployment and very recently a deterioration of living standards, most notably due to deteriorating access to housing because of the real estate bubble. Targeting and shaming foreign firms in high profile publicised campaigns like those against bribery, or for charging too high prices, as in the case of GSK or Danone, is an easy way of improving the popularity of the new leadership in difficult economic times. The crackdowns and shaming campaigns may be in large part politically motivated rather than purely based on economic rationale.

Secondly, the level of corruption of the state apparatus is certainly having a serious impact on the efficiency of the Chinese economy. Bribery has seriously affected quality standards in food and pharmaceuticals, as shown by the Zheng Xiaoyu case. Bribery also weakens the capacity of the Chinese authorities to enforce an efficient competition policy. Even though industrial policies aimed at developing national champions take precedence over competition policy in the eyes of the Chinese leadership, foreign companies that extract rents from Chinese consumers due to abuse of market power and collusion are not beneficial for the Chinese economy. The Chinese government might be using its increasing bargaining power (stemming from the fact that the Chinese market is more important than it has ever been for the international strategies of MNEs in this period of global recession) to set stricter rules, but that does not necessarily mean that these discriminate systematically against foreign firms. In the wake of the GSK case, SinoBiopharm and Gan & Lee, two Chinese pharmaceutical companies, also came under scrutiny. These attacks against MNEs might reflect a move to reduce business-induced corruption in general, targeting both MNEs and Chinese firms, and aiming to upgrade safety standards and to

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5 Zheng Xiaoyu was the director of China's State Food and Drug Administration from 1999 to 2007. He ordered the approval of dangerous medicines after being bribed by pharmaceutical companies which then led to the deaths of numerous patients.
clamp down on the abuse of dominant positions on the domestic market. If MNEs are attacked more often, it is probably because of the political factors mentioned above.

Thirdly, as this report will highlight, the Chinese economy at its current stage of development is still very dependent on technology transfers from MNEs and still needs to develop more international cooperative research projects. It is not yet in a position to develop sufficient ‘indigenous innovation’ capacities and reduce high-tech investments from MNEs by bullying them too hard.

The GSK bribery case is not exceptional in itself. The lobbying practices of numerous pharmaceutical companies regularly go beyond the shady border between lobbying and bribery, using various means to neutralise the regulatory capacities of the state. What is different is that the GSK case targeted a foreign company with a high level of publicity that was unseen in China. Even if political factors might explain why Chinese firms have not been publicly treated in such a harsh manner, one should not consider that GSK’s alleged bribery practices, which according to Chinese official sources have apparently been admitted to by some GSK officials, should be tolerated anywhere.

The stricter attitude of the Chinese authorities experienced by some MNEs in the last few months may not be directly linked to the industrial policies actively pursued by the Chinese authorities, which have been relatively consistent for decades and which have not been fundamentally modified by the successors to Deng Xiaoping. To understand the industrial policy of the PRC, one needs to consider its long-term development.

1. The origins of the Chinese industrial policy

The seizure of power by the CCP and the shock of the Korean War generated a shift toward a state-led economy organised through central planning, which started in 1953. China’s industrial development was inspired by the Stalinist model of industrialisation based on the rapid development of capital intensive industries. Because the PRC was not recognised as a legitimate state by the most advanced Western economies, Soviet technology transfers were decisive in the first stage of development of the capital-intensive industries, notably energy, aerospace, electronics, telecoms and steel. In order to preserve national sovereignty and oppose what the CCP labelled as ‘Khrushchev’s revisionism’, the PRC broke off its relations with the USSR in 1960. In a state of diplomatic and economic isolation, the CCP leadership attempted to step up the
pace of industrialisation through an intensive mobilisation of the countryside, inspired by an idealised vision of the Stalinist industrialisation drive, but with Chinese specificities. The Great Leap Forward was ill-conceived, planned without properly qualified management and imposed by brutal means on the rural population. This disastrous policy, combined with extremely unfavourable climatic conditions, led to a famine than claimed more than 20 million lives in 1960-1961.

This tragedy seriously eroded the legitimacy of Mao’s leadership, notably in terms of economic policy. In 1966 with the rise of external tensions and dissent within the CCP, Mao, supported by the army, resorted to the Cultural Revolution to strengthen his hold on the CCP and on Chinese society. The so-called ‘bourgeois revisionists’ who had criticised Mao’s Great Leap Forward strategy were purged from the CCP or eliminated. To achieve this, Mao carefully and cynically used young students and the army. The Cultural Revolution did not affect the Chinese economy as much as the Great Leap Forward in the short term. GDP did not collapse and scientists working in military high technology were preserved from most political excesses. Nevertheless, the long term impact of the disruption and closures of Chinese universities was significant and partly explains the shortage of highly skilled academic personnel as late as the 2010s.

The geographic distribution of China’s industrial structure was transformed in the 1960s. The initial industrialisation wave, supervised by Soviet experts in the 1950s, had developed large, highly concentrated industrial clusters in Shanghai, Tianjin and the Northeast provinces. After the PRC-USSR split, the CCP opted for small scale decentralised industrial centres scattered in central China for strategic reasons and because of the lack of access to foreign technology necessary for building large-scale industries. China’s economy became fragmented into semi-autarchic local economies (Wedeman 1993).

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6 These tensions included the US’s increasing involvement in Southeast Asia in 1965 with the sending of hundreds of thousands of troops in Vietnam and Indonesia and the support provided by the CIA to General Suharto’s coup that ousted the pro-PRC Sukarno and resulted in the death of 400000 communist militants, many ethnic Chinese.
7 The “Down the countryside” campaign.
8 The “Third Front” strategy’s aim was to resist a US- or USSR-led invasion.
When Mao and Zhou Enlai saw the opportunity to break away from international isolation with the U-turn of US strategy vis-à-vis China in 1968, they operated a radical turnaround between 1968 and 1975 which led to the purging of the army, the ‘down to the countryside’ campaign and the marginalisation of the so-called leftist faction in the CCP, notably the notorious Gang of Four. Economic reformers like Deng Xiaoping were progressively reinstated in the party. This radical shift was notably generated by the awareness of the need to modernise the Chinese economy. Mao and Zhou Enlai could not ignore the fact that the state of quasi economic autarchy, which the PRC endured since 1960, was not sustainable. In the late 1960s and early 1970s, hostile pro-Western Asian neighbours such as Japan, South Korea and Taiwan were industrialising much faster thanks to access to US technology and Western markets. Recognition of the PRC by the United States and its allies in Western Europe and in East Asia could break the economic and technological isolation of China.

2. China’s industrial policy after the opening up of the economy

In terms of industrial policies, the Chinese government adopted a three-pronged strategy starting in the 1980s.

The first aspect of this strategy was to insert China in the capitalist international trading system by exploiting the comparative advantage of the Chinese economy in light, labour-intensive industries like textiles, shoes, toys and basic household appliances. The CCP authorised private indigenous entrepreneurship in these export-oriented manufacturing activities. This stimulated a process of private sector, dynamic and export-driven industrialisation in some coastal provinces, notably in the south like Zhejiang, Fujian or Guangdong.

The second was to exploit the size of China’s potential domestic market and its vast pool of cheap and relatively qualified labour force to attract MNEs in Special Economic Zones and to benefit from economic, technological and management know-how spillovers, notably though forced joint-ventures. The Chinese authorities also helped to develop export platforms, following the example of some other East Asian economies during the preceding decades.

9 The destabilising effects of the Vietnam war on the US economy, society and geopolitical position, together with the USSR’s military intervention in Czechoslovakia in 1968, convinced the Nixon administration to adopt a rapprochement strategy towards the PRC in order to facilitate an American withdrawal from the Vietnam quagmire and to weaken the Soviet position in international affairs.
The third aspect was to select national champions in key industries and services which would be protected by the state against foreign competitors while the Chinese economy was progressively opening up to trade and FDI. In the view of the CCP leadership, these national champions would eventually become global competitors, which would guarantee national economic sovereignty and the political control of the CCP.

One could consider this evolution of the 1980s and 1990s as the shift from the Soviet model of industrial policy towards a model inspired by the Japanese or South Korean experiences, but adapted to the political specificities of China’s political and economic system. After two decades of economic opening-up and loosening of central planning, the CCP faced four challenges to its control of Chinese society and economy and to its vision of national sovereignty which forced it to adopt a consistent industrial policy.

Firstly, the economic opening up of China had created growing socio-economic disparities between the various provinces and municipalities. Eastern coastal areas had been developing much faster due to a vibrant indigenous export-oriented light industry and the success of SEZs for MNEs. This was problematic for the cohesion of the country, especially for a party whose ideology was still derived from a Maoist version of communism.

Secondly, it led to an increasing fragmentation of the Chinese economy until the 1990s. In the mid 1980s and early 1990s, the provinces engaged in competing industrial policies to improve their respective position in the new division of labour in the reformed Chinese economy. Provincial and local authorities engaged in interprovincial and even sub-provincial competition to access commodities to foster their industrialisation and they adopted mercantilist practices. Local authorities nurtured local champions through subsidies and local protectionism in potentially high growth industries like automobiles, household appliances or chemicals. Competition between provincial or even sub-provincial authorities had serious consequences on the national economy. Local protectionism fragmented the domestic market and in many industries prevented the necessary rationalisation of production units which were too small to fully exploit existing economies of scale. Local subsidies and artificially cheap loans encouraged a growth essentially based on investment and generated overcapacities which undermined the profitability of Chinese industries. The provinces also seemed to be gaining an increasing degree
of economic autonomy, even developing their own trade and industrial policies, and controlling the vast majority of tax income. Politically, this led to increasing tensions between provincial and local authorities. These centrifugal forces had the potential to weaken the central state and the hold of the CCP on its bureaucracy and on local private entrepreneurs.

Thirdly, as the Chinese authorities decided to accelerate the opening up of the Chinese economy and to welcome more large MNEs into their domestic market, the risk of losing national champions in key industries and services was increasing. The opening up of emerging economies (such as Mexico, Argentina or East Asian economies) or former centrally planned economies in Eastern Europe to FDI in the 1990s had led to the elimination or acquisition of inefficient national firms by foreign-based MNEs, generating a loss of national economic sovereignty in strategic sectors such as telecoms, energy, transport, banking or utilities.

Fourthly, this investment-led growth became more extensive rather than intensive. Between the 1980s and the late 2000s, total factor productivity growth accounted for a shrinking share of China’s economic growth. This type of growth was more energy consuming and generated growing environmental costs and seriously limited the future potential growth of the Chinese economy.

The Chinese industrial policy designed in the late 1990s attempted to take into account these four challenges to China’s national sovereignty and CCP control.

3. The objectives of China’s industrial policy

Despite the ongoing opening up and privatisation processes taking place in the PRC, China’s industrial policy has been designed within a framework that is still inspired by Marxist ideology. It also has domestic and international political objectives. One also has to keep in mind the specificity of China’s economic transition from a centrally planned economy toward an economy that authorises private investment. One could claim that relations between big business and the state are polar opposites in China and in Western economies. Contrary to the situation which prevails in the EU, in the PRC it is the state, not business, which is in the driving seat. Any Chinese CEO of an SOE could probably be dismissed at the will of the CCP Politburo while the

10 In one extreme case, this even led to intervention of local controlled militias forces in a inter-provincial trade dispute
reverse cannot be said of Western CEOs. Long-established property rights in Western capitalist societies limit the capacity of the state to control business, even in dictatorial times. Large Western firms can exploit their lobbying power through media and finance to influence elected politicians in a way that is still unthinkable for Chinese firms. Naturally, the strengthening of private property rights and the growing representation of private entrepreneurs in the CCP and in other, less influential groups - such as the Chinese People’s Political Consultative Conference or the All-China Federation of Industry and Commerce (Zhōnghuá quánguó gōngshāngyè liánhéhuì) - which nevertheless have some influence over the design of economic policies, could modify the level of asymmetry between the party-state and business leaders.

3.1 The political objectives of China’s industrial policy: domestic cohesion and strategic autonomy

At the domestic level, the development of national champions closely controlled by the state and the CCP is seen as a way to counter centrifugal forces that are generated by local authorities and private entrepreneurs not directly co-opted by the state. These national champions are usually dependent on a privileged access to the entire domestic market and public procurement to resist international competition (notably in infrastructure and engineering, energy, telecoms, transport, utilities, banking). These capital intensive and network industries with high fixed costs require national support and protection. These champions adopt a national strategy and not a provincial-based one. In that sense, they create a strong constituency against political or economic centrifugal tendencies and their development will strengthen China’s economic integration. Apart from a handful of exceptions (which should be analysed in greater detail) these firms are SOEs. Because they lag behind their foreign counterparts in terms of competitiveness, they need protection from the central state, which is the only entity to negotiate at the WTO level. Light, labour-intensive industries such as textiles, shoes, toys or household appliances have a much higher relative level of competitiveness and are far less dependent on the central state for support. These large national champions can be more easily controlled by the central state and constitute a factor of national economic and political integration.

11 Jiang Zemin’s “three represents” theory confirmed at the 15th CCP Congress opened the membership of the party to private entrepreneurs.
At the international level, national champions are seen as an essential tool of national development and strategic autonomy to compensate for China's weaknesses. National champions in engineering, mining and energy can secure China access to raw materials and energy products. The intervention of Chinalco to counter BHP Billiton's attempt to take over Rio-Tinto in 2008 was financially backed by the Chinese Development Bank (CDB) and shows how the CCP can use one of the national champions under its control to pursue a national strategic objective (in this case, preventing a Western firm from acquiring a dominant position in global mining, which could make Chinese access to some resources, notably seaborne iron ore, more costly).

Another strategy that control of national champions permits is for Chinese firms to try and move up the value chain to improve indigenous innovation capacities and reduce the PRC's dependence on foreign technology. By exploiting the huge size of the domestic market and public procurement, the Chinese authorities can hope to create alternative technological standards developed by the PRC's national champions to counter Western standards - notably in IT, where political and strategic implications are highly important especially the control and capture of information).

3.2 Rationalisation of production capacities

The central government has been aware since the 1990s of the necessity to reduce the number of production units by merging companies in order to operate at the minimum efficient scale (MES). In 1997, at the 15th CCP Congress the Chinese central authorities adopted the strategy of 'grasping the large and letting the small go' (Zhuà dà fàng xiǎo) which implied the privatisation or closure of the smallest SOEs and the restructuring of the largest SOEs. In a series of industries which were considered to be strategic (notably automobiles, electronics, energy, metallurgy, mining, machinery, chemicals, construction, transport, aerospace, and pharmaceuticals), the state-owned Assets Supervision and Administration Commission (SASAC) received extensive powers over 196 very large SOEs accounting for 55% of state assets, in order to merge them into 80 national champions, 30 to 50 of which should become global Chinese-based MNEs. The central government has not always managed to achieve this target. In household appliances, DVD players and car industries, the large number of firms backed by competing local authorities prevents any of them from reaching the MES, despite repeated recommendations to the contrary by the central authorities. For example in 2013, there were still over 100 Chinese
vehicle producers which covered only a very small part of the domestic market, while the German-based industry leader VW and its Chinese partners produced 2.8 million cars and had a market share that was larger than 20%. Nevertheless, this strategy has created champions which are large enough to operate at the MES and many of them have managed to feature in the Fortune Global 500 list of the largest companies in the world.

Table 1: Progress of Chinese firms in the Global 500 firms

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<td>Number of Chinese firms</td>
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<td>9</td>
<td>16</td>
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<td>89</td>
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3.3 The ‘Go global’ policy: creating global competitors which can control international production networks and access strategic assets

The Chinese central government was convinced that Chinese champions had to become global competitors possessing intangible assets such as innovation capacities, international management know-how and global branding, in order to control global value chains like the most successful US, European, Japanese or South Korean MNEs. The PRC government adopted the ‘go out’ or ‘go global’ strategy (*Zǒuchūqù Zhànlüè*) which supported in various ways the international expansion of its national champions. In that respect, the Chinese authorities reproduced many elements of the window guidance of the Japanese state agencies to help the development of their MNEs.

The Chinese state provided privileged and subsidised access to capital to support ODI projects through the state-owned Export-Import Bank of China (EIBC). Since 2004, the National Development and Reform Commission (NDRC) and the EIBC have been offering preferential loans and investment insurance to promote ‘resource exploration projects to mitigate the domestic shortages of resources; projects that promote the export of domestic technologies, products, equipment and labour; overseas R&D centres to utilise internationally advanced
technologies, managerial and professional skills and M&As that could enhance the international competitiveness of Chinese enterprises and accelerate their entry into foreign markets’ (UNCTAD, 2006: 210).

The Chinese state also provided aid programs in developing countries tied to ODI projects. At the third Forum on China–Africa Cooperation (FOCAC) (Zhōng Fēi hézuò lùntán) in 2006, President Hu Jintao promised that the EIBC would provide African economies with aid flows amounting to $5bn and simultaneously Chinese MNEs promised to invest $1.9bn in the fields of infrastructure, raw materials and finance. These tied aid programmes are a major factor behind the strengthening of Chinese MNEs in most developing economies in the 2000s. The total funds provided by the EIBC and the CDB in the early 2010 were higher than those lent by the World Bank.

The ODI projects launched by the largest Chinese firms are carefully monitored by the government in a way that is not comparable to Western MNEs, which enjoy considerable autonomy vis-à-vis their governments. The Chinese government does not hesitate to intervene to block an attempt by a Chinese firm to take over a foreign competitor. It may be afraid of a nationalist backlash from the targeted country, if the asset has strategic or symbolic value, but it may also consider that the takeover might not be consistent with the objectives of its industrial policy. For example when the Chinese group Blue Star targeted South Korea’s SsangYong Motors, the Chinese government first withheld takeover authorisation and then allowed SAIC (a joint venture partner of VW) to take over the Korean firm.

Chinese ODI flows have been growing at a very fast rate since 2000 but in terms of stocks, China is still far from reaching the level of the large EU Member States, not to mention the US or Japan.
Figure 1: Chinese ODI flows, 1985-2012


Figure 2: Chinese ODI stocks, 1985-2012

3.3.1 Securing raw materials

The share of resource-seeking ODI in China’s overseas investments, at about 70% of the total, is much higher than that of European firms. This indicates that the PRC authorities’ priority is to support national champions which can secure access to key commodities and energy products. In that category one must not only consider energy and mining companies but also Chinese MNEs engaged in infrastructure, engineering, transport and shipping activities. These companies are key because they can control the whole chain of activities necessary to secure the PRC access to resources. Their development is dependent on the PRC’s diplomatic and strategic goals.

In these fields, Chinese firms have become fierce competitors of EU firms. Through mergers and a privileged access to their domestic market (notably through public procurement or exclusive distribution rights for firms like Sinopec or China Petroleum), Chinese MNEs engaged in these specific activities are among the largest in the world. They benefit from cheap access to capital and from the tied aid programmes proposed by the PRC government to a number of developing countries. Their working experience in developing world conditions (like those that can be found in some remote regions of China) and their capacity to offer projects with cheaper and simpler technology, which sometimes better suit the needs of developing countries, have made them strong competitors, except in the most high-tech sectors. In the developed world, Chinese firms still face serious obstacles before they can meet the technical standards required by host country authorities. They also come up against protectionist reactions in defence of national companies for strategic or economic reasons.\textsuperscript{12}

3.3.2 Gaining access to strategic assets

The Chinese central state and local authorities also support Chinese firms trying to acquire strategic assets in the most developed economies. The Chinese government is well aware of the need for Chinese firms to acquire innovation and branding capacities, international management know-how and access to distribution networks. This has been the most important factor in explaining Chinese ODI in the EU.

This actually reveals the weaknesses of many Chinese national champions and the technological gap which remains between Chinese firms and their competitors from the most advanced

\textsuperscript{12} As in the case of the takeover of the US oil company Unocal by CNOOC that was overwhelmingly rejected by the US congress on national security grounds or the Rio Tinto case mentioned earlier.
In the last decade, some Chinese MNEs have been engaged in large acquisition deals in Europe. TCL took over the television divisions of French company Thomson and German company Schneider in order to benefit from their brands and distribution networks and further penetrate European markets. This was generally analysed as a failure, because TCL could not manage to transform these ailing companies into profitable subsidiaries, thus revealing its weakness in international management know-how. The takeover of Volvo’s car division (owned by GM) by the Chinese car producer Geely and the stake taken by its counterpart Dongfeng in Peugeot’s capital in 2014 also highlight the attempt by Chinese firms to reduce their backwardness in terms of marketing, quality control know-how and innovation. In the last two cases, the main motive of the Chinese firms was not so much to penetrate the EU market as to benefit from technological and know-how transfers to improve their position on their domestic market. These two firms are not among the top five producers in China, which are all foreign-based MNEs, notably VW, and are gaining market share at the expense of Chinese producers. Dongfeng is Peugeot’s joint-venture partner but its own brand models are losing market share in China.

ODI of a more moderate scale supported by the Chinese authorities focuses on access to technology. Chinese firms or Chinese state-owned entities take over small high-tech European companies or open up small and medium-sized R&D research centres that act as incubators facilitating transfers of technology from European to Chinese scientists.

### 3.3.3 Improving access to overseas markets

Chinese MNEs also open subsidiaries abroad to improve their international distribution networks and even produce locally in order to leap over trade barriers and improve the speed of feedback with the final consumers. From the production of mobile phones in Venezuela to that of household appliances in the US, some Chinese firms like Haier or Huawei have opened plants across all continents. More often than production facilities, Chinese MNEs open storage facilities and representation offices to organise their distribution across the EU. In Europe, this type of market-seeking FDI remains essentially circumscribed to companies specialising in light industries such as white goods or basic electric product industries. The involvement of the PRC authorities in these relatively small-scale investments is limited.
3.4 Creating new global standards thanks to the size of China’s domestic market

Network economies\(^{13}\) and switching costs\(^{14}\) generate the possibility for the emergence of a dominant standard in a specific market which gives the producer of that standard strong market power (e.g. Microsoft’s Windows programme for PCs). The development of IT, biotechnologies and nanotechnologies renews global standards in a manner which can quickly and dramatically reshuffle market power across the global economy, as highlighted by the case of Microsoft or the downfall of Nokia.

The Chinese authorities have fully realised the advantage of the size of their domestic market in industries characterised by important network economies, switching costs and learning-by-doing effects. Studying the development of infant industries in microprocessors and DRAMs in East Asia has taught the Chinese authorities the importance of learning-by-doing effects which can redefine comparative advantages across countries. The examples of the IBM 360, Windows or the Internet have shown the importance of public procurement, notably long term military contracts, in the infant industry stages.

In this type of industry, the Chinese government intends to let its national champions fully benefit from the size of the domestic market in order to leapfrog established firms from Western economies and impose new indigenous standards. These Chinese standards will at a minimum protect national champions from international competition, but they could even become regional standards (due to China’s share in East Asian intraregional trade), giving extra market power and royalties to Chinese national champions.

The development of Baidu, created in 2000 by Chinese scientists with research experience overseas and which controls 56.6% of the Chinese market (the market with the greatest number of internet users - more than 500 million) is an example of alternative standards. Another is the development of the IPv6\(^{15}\) protocol for IP addresses, developed by the government-sponsored laboratory CERNET.

\(^{13}\) Network economies occur when the value of goods or services increases with the number of consumers as they become a standard for the market.

\(^{14}\) Switching costs occur when the consumer finds it costly to change from one supplier to another because of the costs of adapting to the new system and standards of the new supplier.

\(^{15}\) IPv6 is a system for the generation of new IP addresses, initially developed in the 1990s by Cisco and Nokia. It offers a much greater potential number of addresses than the current Ipv4 system, which will eventually run out of possible new IP address.
The development of 4G in China: A strategy for developing alternative global standards to protect Chinese champions in telecom industries

The Chinese authorities have been pursuing a very active industrial policy in the telecom industry since 1996. The policy provides active support for national champions in equipment and operating services. A firm like Huawei has connections with the People’s Liberation Army through its founder Ren Zhengfei and through public procurement. Although its complex shareholding structure makes it apparently distinct from the government, its CEO has claimed that without the government’s industrial policy, it would not have survived: ‘if there had been no government policy to protect (nationally owned companies), Huawei would not exist’. The government created the market by providing cheap loans for telecom projects, which created Huawei’s clients. An operator like China Mobile is the result of these government-induced mergers aiming to create a national champion of global size, protected from international competition by a system of protectionist licensing.

When the first 3G mobile phone networks were developed in China, the Chinese authorities and China Mobile favoured the adoption of the CMA instead of the GSM standard, partly in order to build a national standard to protect their national champions in the telecom industries from foreign competition and possibly to facilitate their expansion abroad. The level of technological development and the limited size of the domestic market were not sufficient for the Chinese to impose this standard.

In the case of the 4G, the Chinese authorities are more likely to succeed. China Mobile adopted the TD LTE standards (used in 2% of networks globally) rather than the more-often used FDD-LTE. With 750 million customers, China Mobile is now strong enough for equipment producers like Apple and Samsung to adopt its standard (that is made easier due to the fact that it is possible for high-tech firms to develop products which can adapt to both standards). This means that on the Chinese market, the Chinese producers of equipment and networks will be protected from foreign competition by the cost of adapting to the Chinese standards. Thanks to huge financial reserves, China Mobile and the government have been developing the 4G network at an unprecedented rate and should overtake the EU this year. Priority in awarding contracts was given to Chinese national champions like Huawei or ZTE, although foreign-based MNEs were given a minor share of these large contracts. This could enable the TD-LTE to become a more widely used standard even outside China and give the Chinese producers an edge thanks to learning-by-doing advantages compared to competitors which are less familiar with this technology, thereby facilitating their expansion abroad.
4. The weaknesses of China’s national champions

Despite the growth of Chinese national champions and the acceleration of Chinese ODI in the 2000s thanks to Chinese government support, a closer look at their performance and behaviour reveals major weaknesses compared to their Western and Japanese counterparts.

4.1 Overstaffing

A comparison of the largest Chinese firms with their global competitors reveals that they have larger payrolls and are less capital intensive. This cannot solely be explained by the cheap cost of labour to be found in China. Global competitors from advanced economies operate both in high and low wage countries. Rather, the relative labour-intensiveness of some Chinese national champions can be explained by their lower technological level.

Table 2: Capital intensity of the global 500 (assets/employees)

<table>
<thead>
<tr>
<th></th>
<th>Top 3 firms by industries</th>
<th>Assets/employees (US $)</th>
<th>Comparison with Chinese firms</th>
<th>Assets/employees (US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automobiles &amp; parts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toyota Motor (JP)</td>
<td>1132.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Volkswagen (DE)</td>
<td>724.13</td>
<td>Saic Motor</td>
<td>8.08</td>
</tr>
<tr>
<td></td>
<td>Honda Motor (JP)</td>
<td>748.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Banks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ICBC (CN)</td>
<td>6579.99</td>
<td>Wells Fargo (US)</td>
<td>5286.03</td>
</tr>
<tr>
<td></td>
<td>China Construction Bank (CN)</td>
<td>6414.58</td>
<td>BNP Paribas (FR)</td>
<td>13289.77</td>
</tr>
<tr>
<td></td>
<td>HSBC (UK)</td>
<td>10303.5</td>
<td>Deutsche Bank (DE)</td>
<td>26925.54</td>
</tr>
<tr>
<td><strong>Life insurance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>China Life Insurance (CN)</td>
<td>2509.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ping An Insurance (CN)</td>
<td>2382.23</td>
<td>Metlife (US)</td>
<td>13075.00</td>
</tr>
</tbody>
</table>
### Table 3: Comparison of profit in the Fortune global 500, 2013

<table>
<thead>
<tr>
<th></th>
<th>American firms (101)</th>
<th>Chinese firms (89)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average profits (€ b.)</td>
<td>4,06</td>
<td>2,13</td>
</tr>
</tbody>
</table>

Source: Fortune Global 500 (accessed 14 April, 2014).

#### 4.2 Low profitability

Apart from the big SOE banks, some oil (CNP and Sinopec) and utilities companies (China Mobile, China Grid), all of which are highly dependent on a very protected domestic market, the largest Chinese companies operate with lower levels of profitability than their Western counterparts despite the faster growth of China’s domestic market relative to that of Western economies (see table 2).

<table>
<thead>
<tr>
<th>Mining</th>
<th>Top 3 firms by industries</th>
<th>Assets/employees (US $)</th>
<th>Comparison with Chinese firms</th>
<th>Assets/employees (US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BHP Billiton (AU/UK)</td>
<td>2753.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rio Tinto (AU/UK)</td>
<td>1603.50</td>
<td>China Shenhua Energy</td>
<td>821.14</td>
</tr>
<tr>
<td></td>
<td>Vale (BR)</td>
<td>1480.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobile telecoms</th>
<th>Top 3 firms by industries</th>
<th>Assets/employees (US $)</th>
<th>Comparison with German firms</th>
<th>Assets/employees (US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Mobile (CN)</td>
<td>913.49</td>
<td></td>
<td>Deutsche Telekom (DE)</td>
<td>592.983</td>
</tr>
<tr>
<td>Vodafone Group (UK)</td>
<td>2552.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTT DoCoMo (JP)</td>
<td>3447.98</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oil &amp; gas producers</th>
<th>Top 3 firms by industries</th>
<th>Assets/employees (US $)</th>
<th>Comparison with French firms</th>
<th>Assets/employees (US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExxonMobil (US)</td>
<td>4340.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PetroChina (CN)</td>
<td>634.44</td>
<td></td>
<td>Total (FR)</td>
<td>2309.37</td>
</tr>
<tr>
<td>Chevron (US)</td>
<td>3714.52</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
4.3 Limited innovation capacities

Chinese firms spend far less than their Western counterparts on R&D. Most of the innovations made by Chinese firms centre on product development. These mainly consist of specific adaptations to Chinese consumer preferences or commercial innovations (e.g. Tencent selling digital add-ons for online games). Even the most advanced firms like Huawei or Lenovo are not yet leaders in fundamental research nor are they capable of developing new global standards. Lenovo is now the largest PC producer in the world, but has not yet developed an innovator’s reputation comparable to Apple, Samsung or IBM. Lenovo is still engaged in hardware rather than knowledge intensive services around its products, unlike IBM which has shifted away from hardware. For example, the largest Chinese banks, which are SOEs, are still using servers from IBM and HP for their data as Chinese IT firms cannot offer the global standards for such developed services.
Table 4: Comparison of Chinese firms and top R&D spending firms by sectors, 2010

<table>
<thead>
<tr>
<th>Sector</th>
<th>Top 5 by sector</th>
<th>R&amp;D investment (mio €)</th>
<th>Chinese firms’ positions compared to the Top 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil &amp; gas producers</td>
<td>PetroCN (CN)Royal Dutch Shell (UK) Exxon Mobil (US) Petrolebrasiero (BR) Gazprom (RU)</td>
<td>1339,362 759,58 754,362 740,199 589,916</td>
<td>PetroCN 1339,362 (n° 1) CN Petroleum &amp; Chemicals 546,944 (n° 7)</td>
</tr>
<tr>
<td>Mining</td>
<td>VALE (BR) CN Coal Energy (CN) Rio Tinto (UK) BHP Billiton (UK) Sumitomo Metal Mining (JP)</td>
<td>654,476 169,683 139,393 48,452 43,621</td>
<td>CN Coal Energy 169,683 (n° 2)</td>
</tr>
<tr>
<td>Industrial machinery</td>
<td>ABB (CH) ALSTOM (FR) Sandvik (SE) IHI (JP) Parker-Hannifin (US)</td>
<td>837,104 703 275,542 234,326 205,664</td>
<td>Dongfang Electric 110,564 (n° 24) Harbin Power Equipment 73,556 (n° 34)</td>
</tr>
<tr>
<td>Category</td>
<td>Company 1</td>
<td>Value 1</td>
<td>Company 2</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------</td>
<td>------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>Telecommunications equipment</strong></td>
<td>Nokia (FI)</td>
<td>4938</td>
<td>Huawei technologies</td>
</tr>
<tr>
<td></td>
<td>Cisco System (US)</td>
<td>3930,586</td>
<td>ZTE 896,9 (n° 9)</td>
</tr>
<tr>
<td></td>
<td>Ericsson (SE)</td>
<td>3022,423</td>
<td>TravelSky Technology</td>
</tr>
<tr>
<td></td>
<td>Alcatel-Lucent (FR)</td>
<td>2559</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualcomm (US)</td>
<td>1900,069</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Automobiles &amp; parts</strong></td>
<td>Toyota Motor (JP)</td>
<td>6666,694</td>
<td>SAIC Motor 161,538 (n° 44)</td>
</tr>
<tr>
<td></td>
<td>Volkswagen (DE)</td>
<td>6258</td>
<td>Guangzhou Automobile</td>
</tr>
<tr>
<td></td>
<td>General Motors (US)</td>
<td>5189,596</td>
<td>Weichai Power 100,405 (n° 59)</td>
</tr>
<tr>
<td></td>
<td>Daimler (DE)</td>
<td>4852</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Honda Motor (JP)</td>
<td>4258,717</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commercial vehicles &amp; trucks</strong></td>
<td>Volvo (SE)</td>
<td>1799,061</td>
<td>CN Railway Construction  (CN)</td>
</tr>
<tr>
<td></td>
<td>Caterpillar (US)</td>
<td>1420,02</td>
<td>CN Railway 236,198 (n° 5)</td>
</tr>
<tr>
<td></td>
<td>Deere (US)</td>
<td>784,477</td>
<td>CN Communications</td>
</tr>
<tr>
<td></td>
<td>MAN (DE)</td>
<td>513</td>
<td>Construction 178,167 (n° 7)</td>
</tr>
<tr>
<td></td>
<td>Isuzu Motors (JP)</td>
<td>507,347</td>
<td>CN National Materials</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Construction &amp; materials</strong></td>
<td>CN Railway Construction  (CN)</td>
<td>1062,468 406</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Saint-Gobain (FR)</td>
<td>362,119</td>
<td></td>
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<tr>
<td></td>
<td>Asahi Glass (JP)</td>
<td>259,372</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Daikin industries (JP)</td>
<td>236,198</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CN Railway (CN)</td>
<td></td>
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</tbody>
</table>

Source: Eurostat, Database Science and Technology:  
Figure 3: Comparison of Chinese firms and European firms in R&D expenditure (% of GDP), 2004-2011


4.4 Limited international management know-how
Numerous failed M&A attempts\textsuperscript{16} and their incapacity to overcome cultural differences between local staff and Chinese management highlight the lack of experience of Chinese MNEs in terms of international management. The largest Chinese firms are essentially operating on their domestic market and remain far less internationalised than their Western counterparts. In 2011, the average value of the transnationality index of the one hundred largest Chinese MNEs was 13.4% compared to 60.8% for the one hundred largest MNEs from across the world and 40.1% for the one hundred largest MNEs from developing countries.

4.5 Branding gap
Few Chinese firms have managed to generate globally renowned brands except for Haier in white goods and Huawei in telecom equipment. Chinese products are still considered low quality despite Chinese MNEs attempting to improve the quality level of their products through acquisitions such as Lenovo’s purchase of IBM’s PC division or Geely’s purchase of Volvo’s car division. The dozen Chinese brands which have managed to be included in the Millward Brown 2013 global BrandZ top 100 are the largest SOE banks (the so-called “big four”) and insurance

\textsuperscript{16} 40 M&A attempts by Chinese MNEs failed between 2005 and 2009.
(China Life, Ping an), oil (PetroChina, Sinopec) telecom and IT companies (China mobile, Baidu, Tencent) which are mostly known to Chinese consumers and could not really qualify as global brands recognised across all the major markets of the world.

These various elements show clearly that despite their size, Chinese MNEs are still at the infancy stage. There is still a substantial gap between the Chinese national champions and their global competitors in terms of technological innovation, branding and international management know-how. A comparison with Japanese MNEs at the time they began their internationalisation in the 1960s or of the Korean MNEs in the 1980s reveals that the current position of the largest Chinese firms in terms of capital intensiveness and profitability is much weaker. For Chinese national champions, a privileged or even sometimes exclusive access to their domestic market and the various protectionist tools deployed by the Chinese government are still essential for their survival in the short and medium term.

5. The promotion of ‘indigenous innovation’ capacities

To fill that gap, the government is trying to enhance ‘indigenous innovation’ capacities. Since Deng Xiaoping declared in 1978 that ‘Science and technology constitute a primary productive force’, the focus has been to strengthen China’s scientific base and access to foreign technology through different means. Imports of Western and Japanese technology were made possible after the rapprochement with the US in 1971. After the adoption of the open door policy, compulsory joint ventures between national champions and MNEs could generate technological spillover. The Chinese government also developed scientific industrial parks with the aim of creating incubators to enhance external economies of scale and technological spill-over, drawing inspiration from high-tech clusters like Silicon Valley and Route 128. China also began to send an increasing number of students abroad.

The CCP leadership carefully tolerated Intellectual Property Rights (IPR) violation by local firms on foreign technology. The weak enforcement of IPR and industrial espionage are not too blatant, thereby not being detected by the rules of the multilateral trading system. The PRC enacted an IPR protection law in 2002 after it committed to doing so upon joining the WTO in 2001. The Chinese government adopted a national IPR strategy in 2008 and a National Intellectual Property Development Plan in the framework of the 12th Five-Year Plan. However, despite these steps, the enforcement of IPR remains far looser than in OECD economies. This
was one of the factors prompting an increasing number of foreign-based MNEs to opt for fully owned subsidiaries and to give up their joint ventures with Chinese partners which did not offer sufficient guarantees against IPR violations.

As TFP productivity growth slowed down and as the disastrous effects of China’s extensive growth on the environment and health levels, as well as China’s energy dependence, started becoming obvious in the 2000s, the government put an even greater emphasis on upgrading science and technology to shift toward sustainable intensive growth. In 2006 the CCP launched the 11th Five-Year Plan and also the Medium and Long-Term Plan for S&T Development 2006-20 (MLP), whose introduction was aimed at ‘seizing the opportunities and meeting the challenges brought by the new science and technology revolution’ because ‘despite the size of our economy, our country is not an economic power, primarily because of our weak innovative capacity.’ (…). The MLP report states that ‘One should be clearly aware that the importation of technologies without emphasis on assimilation, absorption and re-innovation is bound to weaken the nation’s indigenous research and development capacity’. The MLP puts forward the necessity to foster ‘indigenous innovation’ and to spend 2.5% of China’s GDP on R&D by 2020.

China’s progress has been impressive. The share of GDP spent on R&D has increased from 0.6% in 1995 to over 1.8% in 2012, close to the EU average which stands at around 2% (Eurostat 2014). Since 2009, China has become the second largest R&D spender in absolute terms (OECD 2012). There are now over 50 large-scale high technology incubators and science parks across China with various specialisations (such as optics in Wuhan with the ‘optic-valley’ or IT in Beijing with the Zhongguancun Science Park). There are over 1,600 R&D centres in China. There are now around 3 million people working in R&D activities in China, a number similar or greater to the US equivalent. The number of Chinese graduates has risen dramatically since the 1980s. The university enrolment rate for 18-22 year olds has climbed from 3.5% in 1991 to 22% in 2006 and 30% in 2013. In 2012, the number of Chinese students who have returned to China after graduating from an overseas university was estimated at between 200,000 and 300,000.

Despite this exceptional development of China’s scientific and technological base, the goal of building ‘indigenous innovation capacities’ is still not a short-term prospect. 1,300 of the 1,600 R&D centres are controlled by foreign-based MNEs. Many R&D centres are controlled by foreign-based MNEs which are very careful about limiting technological transfer. Most of these centres
do not carry out fundamental research but only product development, in order to adapt more quickly to the change of Chinese consumer taste. Some R&D centres are simply created to benefit from tax-breaks offered by the government. Foreign-based MNEs account for a rising share of technology exports, from 73% in 1998 to 88% in 2005 (OECD 2009). MNEs remain the main source of Chinese manufactured exports in the early 2010s.

The vast majority of Chinese who have studied overseas (liuxuesheng) do not return to China, especially the most qualified ones and especially in new technologies like ICT.¹⁷ There is anecdotal evidence that Chinese scholars pursuing careers abroad help Chinese R&D centres and universities to participate in international research networks through cooperation projects, but the scale of this phenomenon is still unclear. Those graduates who do return (haigui)¹⁸ often work for MNEs. To attract them, high-tech Chinese firms like Lenovo or Huawei have to offer wages that are getting closer and closer to those offered by their global competitors.

Chinese universities are characterised by much greater heterogeneity than their Western or East Asian counterparts. The dozen top universities (zhongdian zhong de zhongdian) targeted by specific government programs like the 985 Program of 1998 have reached a scientific level that compares positively with international standards. However, in the late 2000s, only 10% of Chinese professors teaching in higher education held a PhD (Cao 2009). Plagiarism and fraud seem to be far more developed than in the universities of the most developed economies. Most Chinese scientific articles are not cited internationally. In the 2000s, consulting agencies like McKinsey considered that only 10% of Chinese engineers met the requirements of global MNEs. The number of patents registered in China has increased massively. In 2011 China for the first time had more patent registrations (525,000) than the US (500,000). However, most Chinese patents are on product development specifically targeting Chinese consumers. Furthermore, some are registered by foreign-based firms. The amount of royalties per patent is much lower than in countries like South Korea, Japan or the United States. Fundamental research is far less developed in China, amounting to 0.07% of GDP, proportionally eight times less than in France or the US.

¹⁷ There are no widely accepted statistics on this phenomenon as Chinese government agencies publish uncoordinated and inconsistent data but official data and various analysts estimate that the majority, maybe as much as three quarters (see Cao 2009), of Chinese overseas graduates do not return to the country.

¹⁸ Meaning ‘sea turtles’ who go back to their native shore to lay their eggs.
These important shortcomings highlight the distance that the PRC still has to cover before it can reach the level of South Korea, let alone that of the US or Japan. Nevertheless, if the Chinese scientific base continues to widen and deepen at this rate, it will most likely undergo in the medium term the qualitative changes experienced in the recent past by advanced emerging economies like South Korea. The Chinese government has room for manoeuvre in terms of public finance. The share of GDP and government expenditure going to education is still low even by developing country standards (it is lower than in India, Mexico, Thailand or Brazil). The target of 4% of the GDP dedicated to education spending was the target set by the Chinese authorities in 1993 and has apparently not been reached in 2013. There are contradictory Chinese official statements on the level of education spending which put it a little under or above the 4% threshold but international organisations like the UNDP or the World Bank are not giving official recent statistics on China’s education spending in the statistical yearbooks.

6. The barriers raised by the Chinese authorities to protect national champions from foreign competitors

In strategic industries, the role of the central government and also that of some provincial governments is crucial in providing efficient protection to the infant indigenous industries trying to develop potential new technological standards and transform themselves into global competitors.

It is very unlikely that access to the Chinese market will be eased any time soon. One should rather expect the Chinese authorities to adopt a series of typical measures to nurture their national champions. Technical barriers to trade and red tape are widely used, notably in administrative licensing for setting up distribution or for building production units, both at the central and local level. Information about licensing requirements is difficult to obtain and the licensing process requires IP disclosure, notably in industries where joint-ventures are compulsory.

Negative lists or other restrictive rules on inward FDI continue to exist in most of these strategic sectors (energy, utilities, telecoms). Non-transparent and inaccessible public procurement is the norm. Chinese authorities also impose conditions involving technology transfer or import
substitution targets to grant access to public procurement (in high-speed trains or airplanes for example). Public procurement rules contained in the MLP (see above section 5) discriminate in favour of indigenous firms in bidding processes. These are granted the right to modify ex-post the prices in their bids; the Chinese authorities have the right to choose a more expensive Chinese technology within a certain margin (up to 18%) or even above this margin if the market for that technology is likely to experience high growth in the future.

The rationale for this type of infant protection is provided by the well-known theoretical argument of strategic industrial policies developed by Paul Krugman and James Brander and Barbara Spencer (Krugman 1993).

7. The impact of Chinese industrial policies on EU industries and possible reactions by the EU

The Chinese government’s industrial policies to strengthen the innovation, international management and branding capacities of the PRC’s national champions affect EU industries very differently. The state’s support to the large SOEs operating in the strategic industries listed earlier is unlikely to falter in the next five years given the still substantial gap between the Chinese national champions and their global competitors. The CCP leadership is clearly pursuing a long term industrial and trade policy which is inspired from the South Korean and Japanese experiences and close to the conceptual framework of pragmatic economists like Friedrich List and Joseph Schumpeter. The main tools and objectives of this industrial policy have been consistent over the last two decades and should be maintained throughout the 2010s.

7.1. Possible EU responses

7.1.1. An EU Protectionist surge: a non credible threat and a self-defeating policy

The EU will find it difficult to influence China by using trade instruments limiting access to the EU market in retaliation against Chinese protectionist policies. Firstly, many EU MNEs have developed international production networks which include production sites in China through subsidiaries and outsourcing. This limits the scope of products which can be the object of trade reprisals without generating collateral damage for EU businesses. Secondly, the trade dispute over Chinese dumping in solar panels in 2013 has shown that most Members States are not
ready to confront the PRC, because they consider their access to the Chinese market as vital in this period of economic crisis. With the long post-2008 deleveraging process, the restructuring of the financial system taking place in Europe and current demographic trends, EU growth prospects will be limited during the next decade as Europe faces a similar situation to the one Japan faced in the aftermath of the financial crisis in the 1990s. A large part of economic growth will come from export markets and the fastest growing large market is still China, which, according to forecasts, will account for 30% of world growth in the next decade. In 2012, China accounted for more than 13% of EU trade and EU exports to China accounted for almost 1% of its GDP in 2013. The EU is of course an essential market for China but progressively an increasing share of China’s trade is directed toward East Asia and other emerging economies. The Chinese government is trying to switch to a growth strategy which is less dependent on exports and more based on the growth of domestic consumption. Access to EU technology is also important but the EU is not the only or even the best source of advanced technology in key industries like IT and nanotechnologies.

The Chinese government is well aware of this improved bargaining position in bilateral trade relations with the EU. It knows how to deploy an efficient divide and rule strategy, driving a wedge between the various Member States by using selective retaliation with trade instruments such as antidumping measures (French wine or toluidine in 2013), limited access to Chinese large public procurements (e.g. in telecoms) or even financial flows (for countries in the European economic periphery facing serious macroeconomic imbalances). Given the respective bargaining positions of the EU and China and the limited unity among Member states on trade and financial issues since the beginning of the crisis, trying to overcome the effects of Chinese industrial policies by drawing from the toolbox of traditional trade instruments is unlikely to be credible in the eyes of the Chinese leadership.

Finally, even if the EU Member States were ready to collectively adopt a more assertive approach towards the PRC government with the aim of persuading it to abandon its protectionist policies, their chances of success would be slim because of the Chinese political and social context. The new leadership cannot afford to be perceived to be giving in to foreign demands because it would lose face and weaken its authority before it is even firmly established. A tougher EU stance would probably generate increasing tensions, possibly even an escalation to a limited but
damaging trade war, which would indirectly benefit other advanced economies with strong economic ties to China.

### 7.1.2. The necessity to upgrade the knowledge-based economy of the EU and overcoming the limitations of the Lisbon and Europe2020 agendas

As Chinese champions are likely to continue to benefit from state support and protection and through learning-by-doing effects, they will progressively move up the value chain and challenge a large span of EU firms in a host of industrial sectors. The Lisbon and Europe 2020 strategies were designed to face such challenges and to move toward a ‘knowledge-based’ economy, stressing the need to upgrade the technological level of the EU economy by raising the share of GDP spent on R&D to 3%, upgrading human capital and increasing the flexibility of the labour market to foster the shift of the labour force from sunset to sunrise industries in IT, biotechnologies and nanotechnologies. The main problem is that these are ‘one size fits all’ strategies with no binding targets and limited supranational budgets. Moreover, they are supposed to be implemented through an open method of coordination. They have not managed to reduce the technological gap which divides the EU between the North Western Member States (Germany, Benelux, Scandinavia, the UK and France) and those of the South (Spain, Italy, Portugal, Greece) and East of the EU (the NMS).

In 2014, only a hard core of Member States located in the North Western part of the EU have high-tech economies with R&D spending above 2% of their GDP. These Member States host almost all of the high-tech Marshallian districts in sunrise industries; the vast majority of headquarters of the largest EU MNEs in high-tech industries and services; and most of the private fundamental research centres. These Member States have a sufficient technological advance to adjust to the development of China’s industries, to focus on industrial specialisations and niches and to maintain a technological edge in these specific industries. This does not mean that important industries and groups from these Member States would not be in jeopardy due to intra-European or global competition, as shown by the current difficulties of some large French, Italian or Spanish groups. However, most large MNEs from this North Western core have strong intangible assets which should enable them to face off competition from emerging economies and notably from China.
Nevertheless, it seems that in the current context, in which there is no real supranational industrial policy at the EU level, the small Member states, even those which have managed to develop high-tech industries, do not seem capable of preventing their biggest national champions from being taken over by foreign-based (EU or non EU) MNEs. This is the case of the Belgian-Dutch bank Fortis (Belgium’s largest firm until its collapse pushed the Belgian government to sell it to the French bank BNP Paribas) or Finland’s Nokia. So far the biggest Member States have been able to maintain their national champions under national control, even the less competitive ones. This has been done using a variety of means, such as cross-shareholdings (the so-called ‘noyaux durs’), golden shares or poison pill devices and national state participation in their capital allowing them to be refinanced in difficult times. France, Italy and Spain have so far been successful in limiting foreign takeovers of national strategic assets. The extent to which the scientific base of these states of the economic core of the EU is affected by the loss of large national champions is uncertain. How resilient can Marshallian districts be without geographic proximity to the research headquarters of major global firms?

For the EU Member States located in the economic periphery of Europe, the situation is more serious. All technological indicators, from R&D spending to university rankings, innovation autonomy (% of patents registered by local firms), the number of internet users or university spending per student, highlight their gap with the most technologically advanced Member States. This group is not homogenous. Italy and Spain control global MNEs in services, utilities and energy but their high technology innovation capacities have been stagnating or even relatively deteriorating in key sectors and their macroeconomic imbalances are dragging them down. Ireland, the Czech Republic, Estonia or Poland are closer to the core group, although they are highly dependent on FDI for their technology and exports and do not possess a scientific base which is as advanced as that of the states of the core group. Member States like Greece, Latvia, Romania, Bulgaria, Cyprus, Malta and Portugal are clearly far less technologically advanced.

The Chinese economy is reaching a technological level which is now comparable to that of the less advanced Member States and the most advanced provinces and municipalities have a stronger technological base than many Member States from the economic periphery of the EU. There is no Portuguese, Greek, Romanian, Latvian or Bulgarian equivalent to Huawei, Lenovo, Tencent or TCL. This remark holds for MNEs from other emerging economies. As China and other
emerging economies move up the international value chain, what is the role of these Member States in the global division of industrial tasks? Some like Ireland, Poland, Hungary, the Czech Republic or Estonia are now deeply inserted in the regionalised production chains of MNEs operating in Europe but face uneven spatial economic development between regions (here taken as NUTS2) hosting large flows of FDI and those left behind. The industries of Member States located outside the North Western core are likely to suffer more from the upgrading of China’s industries.

Due to the economic crisis and the austerity programmes which are being implemented in the peripheral Member States and which are leading to a reduction in spending in higher education and research, the technological gap is widening. Highly qualified people with science backgrounds are mobile and some analyses as well as anecdotal evidence suggest that peripheral economies such as Romania, Bulgaria and the Baltic countries, but also Spain and Italy, are suffering from brain drain and from a decline of their universities. They are not meeting the Europe 2020 targets and are already behind the deadlines of the Digital Agenda. Reductions in government spending and the increasing flexibility of the labour market do not in and of themselves strengthen the technological and scientific base of a national economy. These Member States are not moving closer to becoming ‘knowledge based’ economies. Rather, they seem to be destined to become labour-intensive manufacturing and low-skilled services export platforms. Such an evolution would position their economies in more direct competition with emerging economies exporting manufacturing products, first of all China, but also Turkey or other Asian economies.

If the EU wants to avoid trade wars of attrition and the increased competition generated by China’s industrial policies, it has no choice but to keep its technological edge vis-à-vis China and other emerging economies by pursuing an ambitious supranational industrial policy aiming to raise its technological level, including that of the periphery. This policy is not consistent with the current level of the EU budget and with the current amounts of financial transfers between the North Western Member States and those of the economic periphery. The medium-term cost in terms of cohesion and political collateral damage to the EU of not changing course will be substantial in this context.