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The Turning Point: Reviving Industrial Policy, 2006-2013

China began a new central government industrial policy in 2006 (Chen and Naughton 2016).[1] The new policies began when the Medium and Long Term Program of Science and Technology (MLP) was adopted in 2006, which laid out a fifteen-year program from 2006 through 2020. The MLP was not in itself an industrial policy, but it contained within it seeds that would grow into a full-fledged industrial policy over the next several years. The program, for the first time, emphasized "indigenous innovation" and provided funding for sixteen Megaprojects. This program started small, but gradually gained momentum. Then, when the global financial crisis (GFC) hit at the end of 2008, funding was quickly stepped up. In the wake of the GFC-related stimulus spending, a new effort was made to organize and rationalize the industrial policy push. This effort was finalized by late 2010 with the rollout of the new Strategic Emerging Industry (SEI) program. After 2010, China was committed to a full panoply of industrial policies.

1 This chapter includes material from that article.

The policy orientation had changed enormously since the late 1990s and the days of Premier Zhu Rongji.

3.1. The Resumption of Industrial Policy in 2006

When China resumed industrial policy in 2006, the initial approach was cautious and incremental. Policy-makers pursued what we might call a "top and bottom" approach. That is, policy-makers produced a broad innovation policy framework (the top) and also a list of projects to be funded by the government (the bottom). The innovation policy framework was broad and fairly diffuse, and generally appeared to be consistent with a "horizontal" approach, in which emphasis was placed on strengthening the overall innovation environment, rather than any specific sector.[2] Enterprises were identified as the prime actors in innovation. The slogan of "indigenous innovation," which was introduced at this time, could also support multiple different interpretations. In fact, the 2006 MLP was somewhat schizophrenic: many passages can be read as endorsements for a strongly market-oriented approach, following on the market reform successes of the previous decade, but other passages signal the need for greater government intervention in specific technologies (and, by implication, industries).

The bulk of the document (22 out of 39 pages) is taken up by three separate but over-lapping lists of technologies, categorized into 68 priority sectors, 27 frontier fields and 18 basic research areas. Reform of the science and technology system and building China's national innovation system are described in only four pages; policies and government measures in six; and human resources in two. The Megaprojects —on which I focus below— take up only a single page. There are only three numerical targets in the available summary document: by 2020, R&D should be 2.5%

2 Initial outside accounts of the MLP were generally positive for this reason (Schwaag Serger and Breidne 2007; Cao, Suttmeier and Simon 2006).

of GDP; dependence on foreign technology should decline to 30%; and increased productivity should account for 60% of total growth. The plan itself, then, is not really operational; rather, it lays out principles that are intended to guide subsequent action. In this sense, it is typical of the top-level, programmatic documents that form the keystone of the structured policy process in the Chinese system. It is couched in generalities, and of course the subject of the document is "innovation and science," not industrial policy.

However, the MLP was immediately followed by an implementation document that linked specific objectives in the full detailed plan (not publicly available) to specific bureaucratic agencies. The State Council published a document that listed 99 policy initiatives, and designated a head agency for each (State Council 2006).[3] Most implementation responsibilities were given to the economic ministries, with the National Development and Reform Commission (NDRC) —the former Planning Commission— receiving 29, and the Ministry of Finance (MOF) with 25. The prominent role of economic ministries followed logically from the principle that enterprises were the primary actors in the innovation process, since only the economic ministries were in a position to directly influence enterprise behavior. This document clearly implied that the strategy was a "full court press," that is, that a full spectrum of policy instruments should be applied to support innovation. For example, financial resources included direct government funding, subsidized lending, more-than-100% tax credits for R&D outlays, and so forth: an economic ministry or state bank would have to take the lead in each of these. This allocation of responsibilities brought the economic ministries back into direct industrial policies in a big way. The "hand off" of policy from the top leaders to the ministries gave much greater prominence to actors with stronger economic interests, and created a structure of expertise that was heavier on economic than on technological issues.

3 A subsequent retrospective study classified implementation actions into 65 "major" supporting policies and found that the Ministry of Finance was responsible for 22 of these (Ministry of Science and Technology Policy Regulation and System Reform Section 2007).

In fact, the incremental approach adopted was consistent with traditional Chinese approaches toward experimental policy-making. In a low-information environment, policy-makers started out by addressing and implicitly answering a few simple questions: Where are we going? What are the few essential things we should get started on? The first question pointed toward a broad re-orientation of economic policy toward support for innovation and more sophisticated sectoral structure of output. These things were essential, but also naturally-occurring; changes that would take place at the end of China's very high growth period, already looming. "Indigenous innovation" was part of this re-orientation, even if policy-makers were uncertain how to achieve this. The second question pointed to short-term support for a number of technological and industrial initiatives that would aid that transition. These were not very well specified, but the new policies clearly gave economic agencies permission to undertake a number of direct interventions to foster this type of technological innovation. The most immediately actionable of these interventions were the "Megaprojects."

3.2. The Megaprojects

Sixteen Megaprojects were mapped out in the wake of the MLP. Each of the Megaprojects was state-funded, but with an industrial policy objective. Megaprojects were expected to break bottlenecks and contribute to the development of a competitive industry, building innovative capabilities in sectors with a major impact on economic and social development. Most strikingly, the Megaprojects included IC fabrication, nuclear reactors, and large civilian airliner projects; each of the three areas terminated by the Zhu Rongji administration was brought back to life, bigger and with more resources than ever before.

For the 13 publicly known Megaprojects, the State Council was at the top of the hierarchy and the State S&T and Education Leadership Small Group, chaired by Premier Wen Jiabao,

was in charge of overall coordination and guidance. The Ministry of Science and Technology (MOST) was the overall lead agency for the Megaprojects. The National Megaproject Office is physically located within MOST to organize the daily operations of the 10 civilian Megaprojects. However, with only 5 employees in its Megaprojects office, MOST primarily played a coordination role and shared information. At the ministry level, responsibilities include plan validation, coordination, evaluation, and reporting; here the Megaproject office is the mid-level decision maker and facilitator of communication.

At the project level, each Megaproject has a central ministry in charge of general management. For example, the pharmaceutical Megaproject is led by the Ministry of Health; the water pollution and prevention Megaproject is led by the Department of Environmental Protection. Each Megaproject also has a leading group, which includes a director, a (vice) minister, or a (deputy) director from MOST, MIIT, or another government entity. The leading groups' responsibilities are to organize and coordinate the operations of each Megaproject. This includes recruiting a project chief designer (an engineer), organizing the formulation of plans, arranging applications for subprojects, selecting the advisory board, and appointing a supervisory board. As a whole, the Megaprojects reflect a top-down approach, nominally centralized, where decisions flow hierarchically. Each Megaproject was structured to reflect its own unique characteristics: at one extreme, the space program is a single massive integrated program; at the other, the "core electronic components" program was essentially a coordinated funding agency, with many different research projects contracted out to domestic companies and research institutes. Management of individual Megaprojects was parceled out among 12 different ministries, including the military, plus 2 provinces, 3 state-owned enterprises, and one university (full list below in Table 3.1). Typically, a separate ministry was given oversight responsibilities for each Megaproject. Policy specification continued until the complex structure of each Megaproject was agreed upon and approved, and work began. The first completely new Megaproject

was approved in April 2008 with the launch of the core electronic components project, and the last approval came in May 2010 for the high resolution earth observation satellite.

3.2.1. Technology Choice in the Megaprojects

For the most part, the MLP Megaprojects are large-scale goal-driven projects focusing on the advancement of engineering rather than basic science capabilities. They are clearly influenced by "industrial policy" considerations, in that the selection of civilian projects is obviously influenced by a view as to which industries are relatively promising. However, they are not directly industrial policies themselves since they do nothing to direct resources to specific industrial sectors. How the technologies are to be transferred to businesses remains unspecified.

The MLP groups together nine civilian and seven military/dual-use Megaprojects, 13 of which are known to the public while three remain unpublished. However, according to various internet sources, the three defense Megaprojects have been deduced to be: the Shenguang Inertial Confined Fusion (ICF) Project; the Beidou Navigation System; and the Hypersonic Technology Vehicle. Of these, the Beidou system is viewed as a success and is now publicly acknowledged as a Megaproject, while information on the other projects is classified and extremely scarce. Table 3.1 illustrates the stated goals and level of funding (as of 2009-2010) of the technologies developed by the 16 Megaprojects.

Table 3.1: Overview of the 16 MLP Megaprojects

Project Name	Sector	Project Goals	Total Funding (in RMB)
Core electronics, high-end general microchips, and basic software	Civilian	Develop high-end communication microchips, basic software, and core electronic components	100 billion (estimated)

ULSI manufacturing technology	Civilian	Industrialize the 90 nm ULSI, produce sample machinery for the 60nm ULSI and acquire key technologies in making the 45 nm ULSI	18 billion
Next generation broadband wireless mobile communication	Civilian	1. Upgrade technologies of the current cellular mobile communication system, including high-speed packet access (HSPA), i.e., 4G; 2. Develop Broadband wireless access technology, including WiMax; 3. Develop a short-distance wireless system and censor network	70 billion (20b from central government)
High-end CNC machine tools and basic manufacturing technology	Civilian	Improve China's manufacturing abilities of high-end machinery: e.g., high-precision machinery for aviation, space, shipbuilding, and other industries	21 billion
Large-layer oil and gas fields and coal-bed methane development	Civilian	Develop exploration and mining technologies for oil, gas, and coal-bed methane resources under complex geological conditions in Western China	60 billion (20b from central government)
Large-scale advanced pressurized water reactor (PWR) nuclear power plant and high temperature reactor (HTR)	Dual-use	Obtain key technologies in PWR and build the first commercial plant; acquire key technologies and build a demonstration plant using HTR	15 billion from central government (11.92b to PWR; 3b to HTR)

Water pollution control and treatment	Civilian	Control and protect pollution, develop water treatment technologies, support coordination of regional water access and ecological planning	30 billion (estimated)
Genetic transformation and breeding of new plants	Civilian	Research transgene technologies to develop new pest-resistant breeds of higher quality and productivity	20 billion
Research and creation of major new drugs for China	Civilian	Develop 30 to 40 drugs new to Chinese production with market competitiveness and intellectual property protection	55 billion (estimated)
Prevention and control of major infectious diseases, including HIV/AIDS and Viral Hepatitis	Civilian	Develop new vaccines and treatment methods for infectious diseases such as HIV/AIDS and Viral Hepatitis	Unknown
High-resolution Earth observation system	Dual-use	Develop an observation system consisting of satellites, aircraft, and stratospheric airships; build ground facilities such as observatories and data centers to enhance self-supply of spatial data	40 billion
Large passenger aircraft (C919)	Civilian	Design and build China's first large passenger aircraft C919	200 billion (estimated)
Manned space flight and lunar exploration	Dual-use	Implement the Chang'e lunar probe and Shenzhou manned spaceship	Shenzhou budget 39 billion until 2013
Shenguang Inertial Confined Fusion (ICF)	Defense	*Information not released*	Unknown

Beidou Navigation System	Defense	Build a navigation network consisting of 30 satellites by 2020 (S&T Daily 2012)	Unknown
Hypersonic Technology Vehicle	Defense	*Information not released*	Unknown

Sources: own elaboration. There are no comprehensive published accounts for the Megaprojects. The table was compiled from 2009-2010 press reports by Lu et. al (2012).

3.2.2. Megaproject Management

The Megaprojects were set up in a careful fashion, with a "dual leadership" system. A standard Megaproject has a leading group with a vice minister as the head and a working office located in one of its supervisory ministries. The research side is then organized with a chief engineer or designer and several deputy chief engineers. They serve the main role of planning and supervising the R&D activities. In addition to this "standard model," however, two Megaprojects were organized as corporations and given a more market-oriented perspective. These were the C919 Large Passenger Aircraft project and the large-scale advanced pressurized water reactor (PWR) nuclear power plant and high temperature reactor (HTR). The most distinctive feature of the large aircraft project is that an independent company, Commercial Aircraft Corporation of China, Ltd. (COMAC), was created to run the Megaproject as a business rather than a government project. China National Nuclear Power Cooperation (CNPTC) was established, as a state-owned enterprise (SOE) owned solely by the state. In a significant innovation, COMAC was set up as a joint stock corporation; its shareholders include SASAC, Shanghai Guosheng Group Corporation (founded by the Shanghai government), Aviation Industry Corporation of China (AVIC), China Aluminum Corporation (CHINALCO), and other SOEs. As the Shanghai government is COMAC's second largest shareholder, this indicates that, of all the provinces bidding for C919, Shanghai gained the most in the competition for C919 stock.

Both of these corporations were established to meet two objectives: on the one hand, they were designed to give participants a clearer market goal than was the case for the other Megaprojects; on the other hand, they were established in part to resolve conflicts and lobbying among existing stake-holders and localities. By requiring "buy in" from these competing stake-holders (literally so, in the case of COMAC), the corporation became a form for regulating competing interests. In some important respects, the COMAC model was a precursor of approaches that became much more common over the next 15 years. As chapter 5 will demonstrate, joint ownership by diverse state-controlled entities is now a common form of organizing industrial policy initiatives.

The Megaprojects are said to be supervised by an evaluation system operated jointly by MOST, NDRC and MOF. The supervision mainly focuses on two aspects: project implementation and financial management. Four supervisory groups were formed in 2010 and 2011 to perform evaluation work: the electronic and information technology group, energy and environment protection group, biology and pharmaceutics group and advanced manufacturing group. The evaluation system for the military and dual-use Megaprojects remains unknown, and internal auditing, inspection and evaluation processes remain opaque.

3.2.3. Evolution of the Megaprojects

The Megaprojects were all set up in 2007 and 2008, but spending began in 2008. However, total outlays were just 6 billion RMB, as several of the Megaprojects were still in preliminary organization. When the global financial crisis (GFC) hit at the end of 2008, the Chinese government responded with a massive stimulus effort. As part of that response, Megaproject implementation was accelerated, and an attempt was made to hurry all projects into implementation by the end of 2009 (Chen 2010). Disbursements spiked to 33 billion RMB in 2009, and then resumed more normal growth, leveling off at around 45-50 RMB annually. While small in

relation to today's industrial policy effort, these sums meant that the Chinese government was now sustaining a significant flow of resources into the industrial policy arena.

3.3. The Second Wave: Strategic Emerging Industries

The strategic emerging industries (SEI) program constituted a second wave of techno-industrial policy. There are both similarities and important differences between the Megaprojects and the SEIs. There is significant sectoral overlap: some SEI initiatives are direct continuations of individual Megaprojects, and most Megaprojects have some relation with a subsequent SEI. Since the Megaprojects were from the start directed at technologies that could be quickly commercialized, and given that there are many more SEIs than Megaprojects, this relationship is to be expected (see Table 3.2 for full list).

3.3.1. A Fully-Fledged Industrial Policy

The most important distinction between the SEI program and the existing Megaprojects was that the SEI program was from the beginning an industrial policy. Unlike the Megaprojects, which are fully government-funded, SEI development is not to be driven *primarily* by government funding. Instead, government is supposed to "make the market," creating favorable conditions for enterprises to develop and grow. The lead agency for SEIs was always the NDRC, the main economic planning agency, in contrast to the MLP and Megaprojects which were initially led by MOST and started as science policy, and only subsequently spilled over into industrial policy. The SEI program sets specific goals, roadmaps, and targets for all its designated industries. In this sense, the SEIs are best thought of as a continuation of the "full court press" that emerged from the specification of MLP policies by the economic ministries.

The preferential policies are more sharply focused on specific sectors, and this naturally establishes substantial continuity with the Megaprojects (Table 3.2).

Table 3.2: Sectorial Targets of Industrial Policy

16 Megaprojects (2006-2015)		20 Strategic Emerging Industries (2010-2020)	
			Energy Conservation and Environmental Protection
		a.	Energy efficient machinery
1	1 Water pollution control and treatment	b.	Environmental protection
		c.	Recycling and Re-utilization
2	ULSI Semiconductor Manufacturing		**Next Generation Information Technology**
3	Next generation broadbrand wireless	d.	Next generation internet
4	Core electronics and high end software	e.	Core electronic components
		f.	High end software and information services
			Biotechnology
5	Mayor New Drug Initiative	g.	Biopharmaceuticals
6	Major Infection Desease Initiative	h.	Biomedical engineering
7	Genetic transformation and plant breeding	i.	Biological Agriculture
		j.	Bio-manufacturing Industry
			Precision and High-End Machinery
8	Large Passenger Aircraft	k.	Commercial Aircraft
9	High-Resolution Earth Observation System	l.	Satellites and Applications
10	Manned Space Flight and Lunar Landing	m.	Railroad and Transport Machinery
		n.	Marine Engineering Equipment
11	High-end Numerically Controlled Machine Tools	o.	Intelligent Manufacturing Equipment

			New Energy
12	Large-bed Oil & Gas; Coal Gasification	p.	Wind Power
13	Large High-Pressure Nuclear Reactor Technology	q.	Solar Power
		r.	Biomass Energy
14-16	Three Undiscloser Military Projects		**New Materials**
		s.	New Materials
			New Energy Vehicles
		t.	Electric Vehicles & Plug-in Hybrids

Sources: own elaboration based on Chen and Naughton (2016).

Sectors are included in the SEI initiative because they are expected to be large and important in the future, but also because they have qualitatively new elements that have not been fully mastered anywhere in the world. Because of the absence of entrenched incumbent firms or countries, these industries are seen as providing competitive opportunities. SEI strategy thus reflects the insight that new industries present an opportunity for leapfrog latecomer development (Perez and Soete 1988). The SEI program reflects an attention to a high degree of technological opportunity, combined with confidence that the returns on innovation will be appropriable, given China's ongoing manufacturing cost advantages. The SEI approach is encapsulated in the often-repeated slogan: "seize the commanding heights of the new technological revolution" (Wan 2009).

3.3.2. Formulation of the SEIs

The SEI program came together quickly in the wake of the Global Financial Crisis (GFC), whose shockwave hit China in late 2008. As is known, China's response to the GFC was large, prompt, and decisive: A large fiscal stimulus was quickly followed by a massive flood of bank credit. The initial response relied primarily on

"horizontal" fiscal and monetary policies to pump up domestic demand to offset the impact of rapidly falling exports. However, government quickly followed up with interventions into specific industrial sectors, beginning with those severely crisis-hit. A package of ten "Industrial Revitalization" policies was rolled out in February 2009 covering ten mostly traditional industries (steel, autos, etc.), which though highly interventionist, were potentially short-term crisis responses. In fact, central government support expanded rapidly into high technology industries, while local governments began to convert the financial windfall from the stimulus into longer-term industrial development programs.[4]

The concept of "strategic emerging industries" sprung from this environment of rapid-fire pragmatic intervention (Zheng 2010). Fermentation occurred as policy-makers and intellectuals cast around for a rationale to convert ad hoc interventions into a long-turn program. Premier Wen Jiabao played a prominent role from the beginning, so fermentation led briskly into policy formulation. In the fall, Wen presided over a series of brainstorming sessions on the impact of new technologies, involving 47 scientists, engineers, and entrepreneurs. Ultimately, Wen found a sweeping justification for a major initiative: According to Wen, all through history, major crises like the GFC were followed by major technological breakthroughs. The countries that mastered these revolutionary new technologies transformed their economies and became the successful (and dominant) economies of the post-crisis eras. Developed countries were redoubling their support for emerging industries to mitigate crisis, and China should seize this opportunity. Wen poignantly contrasted the present opportunity with four instances since the 1700s when, he said, China had missed a technological revolution, and fallen behind as a result.

In November 2009, Wen Jiabao formally announced a Strategic Emerging Industries initiative, and selected seven broad industrial sectors for inclusion; the top leadership collectively endorsed the policy the next month at the Economic Work Conference. The

4 For example, see the two successive State Council documents (2009/a/b).

cornerstone of the policy formulation process was laid early the following year, when an Inter-ministerial Coordinating Group on Accelerating the Development of the SEIs was constituted. Made up of representatives from 20 ministries and chaired by the NDRC, the group held its first meeting on February 7, 2010. Its goal was to write a programmatic SEI policy, which would lead into an SEI Five Year Plan for the 12th Plan Period (2011-2015). A writing group under the Coordination Group was set up, again headed by the NDRC (a vice-minister, Zhang Xiaoqiang). Besides coordinating divergent ministerial interests, the group established a robust consultation process. During March and April 2010, a series of local studies and meetings were held in Wuhan, Shenyang, and Shenzhen involving state enterprises and a few well-established private firms. Studies were commissioned from the Chinese Academies of Science and Engineering and compiled with comparative international data into a 3,000-page collection of reference materials.

Given the high level of agreement that had already been established on an SEI policy, policy formulation largely focused on the scope of the program. After occasionally contentious discussions, Wen Jiabao's original seven broad sectors were augmented with the addition of "precision and high-end machinery" as a major sector (Table 3.2); while "new drugs" and "genetically-modified organisms" were consolidated into a "biotechnology industry," maintaining seven total sectors. "Electric vehicles" was replaced with the more cautious "new energy vehicles" (including hybrids). These changes made the SEIs much larger and shifted the definition further from a technology focus to an industrial policy focus. The addition of "high-end equipment manufacturing" included large machine-building sectors that were certainly not "new" or "emerging," globally or within China. These changes reflected the procedural influence exercised by the lead economic planning agency.

The State Council passed the keystone SEI document, "Decision to Accelerate the Cultivation of Strategic Emerging Industries" on October 10, 2010 (State Council 2010). This was good timing. A week later, the 5th Plenum of the Communist Party Central

Committee passed the "Party Center Suggestions on drawing up the 12th Five-Year Plan for National Social and Economic Development" (CCP 2010), which was the keystone document for the five year planning process. The SEI processes and the Five Year Plan processes were now fully in step. From a situation a decade earlier in which Five Year Plans had become almost irrelevant, the coordination of SEIs and the 12th Five Year Plan had now brought this plan back toward the center of economic policy-making.

The policy specification stage now proceeded in tandem for the SEIs and the 12th Five Year Plan (12FYP). Responsibility for drawing up a sector-specific 12FYP was delegated to a ministry or subministry. Overall specification was handled "in house" by the Inter-Ministerial Coordination Group, and again specific policy responsibilities were disaggregated to ministries. All the main government financing agencies and regulatory bodies signed memoranda of participation in a joint financing program, utilizing loans, stock markets, bond issuance, and increased investment funds, including venture funds. Direct funding from the government budget was to account for only 5-15% of the total funding effort (Fang and Yang 2011). In short, while the Megaprojects were directly funded by the government, the SEIs were to rely on indirect support from the government, through (government-owned) financial institutions, tax exemptions, and regulatory support.

Two dozen sector-specific 12-FYPs, each covering a single SEI, were issued in 2012. While the planning process had been top-down until this point, and from general to specific, the original SEI drafting group now stepped in for a second round, aggregating the individual sectoral plans into a "portmanteau" document that covered the entire SEI program. This document was submitted to the State Council, which approved it and formally issued it on July 9, 2012. This completed the policy specification process, as all tasks had been turned over to the implementing bodies, and the SEI program became a solidly entrenched part of the Chinese policy regime. It has remained so today, although, as the next chapter shows, it underwent significant revisions in 2015-2016.

3.4. SEIs and the Policy Turning Point

Implementation of the SEI policy is a work in progress. Since 2009, policy has been adapted to changing circumstances in a broad range of diverse sectors. As was the case with the Megaprojects, multiple and overlapping instruments are used in SEI implementation, and local and central government agencies cooperate and compete in the promotion of SEIs and support for specific firms. From the beginning of January 2011 through June 2014, the State Council and various national ministries promulgated 439 different policies to implement the SEIs (China Engineering Technology Development Strategy Academy 2015). Local governments have plunged into the implementation of the SEI program. Due to the proliferation of instruments, it is impossible to estimate the overall resource effort involved in the SEI program. However, it is clear that this effort grew dramatically in the years after the GFC in 2008. The magnitude of the program has been consolidated and expanded steadily in the decade since.

The dramatic change of policy is indicated by the pervasiveness of the new policy guidelines. Back in 2000, the government's guiding policy principle had been that market forces would drive decision-making, and that these forces would ultimately determine the sectoral development of the economy. By 2010, the guiding policy principle was that sectoral priorities outlined in the SEIs would guide government decision-making at all levels, and that governments would guide firms to follow in these directions. Not only were the big ticket items eliminated under Zhu Rongji brought back (as Megaprojects), but the direction of change and the principles on which policy was based were both reversed. Moreover, close analysis of the policy process shows that the apparent "over-shooting" of policy (compared to the vague language of the apex document) was actually an intrinsic feature of the procedures through which policy was specified and implemented.

Finally, the fact that two successive structured processes of policy change succeeded one another in a short time helps explain how policy could have changed so dramatically. The MLP was a

major change of direction, but initially a rather modest resource commitment to the new policy direction. But just at the moment when the MLP was going into full implementation, another wave of policy-making was triggered by the impact of the GFC. The response to the GFC greatly encouraged Chinese policy-makers. The massive Chinese stimulus program was generally welcomed and highly appraised in international opinion. Moreover, Chinese policy-makers did not fail to notice that developed market economies had resorted to direct government interventions —and in targeted industries— when they had to move decisively to stave off economic collapse. Post-crisis, China also had to move decisively, either to roll back stimulus measures as the economy recovered, or to package them and give them a deeper rationale. They chose the second, and before initial interventions could be assessed or re-evaluated, they were re-launched with even greater vigor, and with more generality and more specificity. Thus, at the end, the two waves of the MLP and SEIs were enough to launch China into a completely new industrial policy regime.

3.5. Conclusions

The Chinese approach to industrial policy made a 180 degree turn after 2006. How is it that such a dramatic change in policy attracted so little attention at the time? The answer lies in the distinction between policy innovation and resource allocation. The year 2006 was clearly a turning point in the sense of policy innovation. In contrast to the Zhu Rongji era, Premier Wen Jiabao signaled in 2006 his determination to have the central government directly shape the industrialization trajectory. Government investment, via the Megaprojects, and targeted subsidies quickly became a permanent part of the policy mix. Yet initially these interventions were minuscule in relation to the economy as a whole. "Indigenous innovation" attracted discussion and elicited debate around the world, but it was still seen as a relatively small part of Chinese development policy, and this was appropriate. Also, it took time to

set up an administrative structure to administer these grants, to say nothing of a planning structure for making determinations about priorities.

The situation began to change as the world tipped into the Global Financial Crisis (GFC). The administrative structures to run the Megaprojects were put in place just before the GFC and as the GFC was starting. Ramping up of the Megaprojects thus took place in the context of the vast Chinese stimulus program of 2008-9. Chinese policy-makers declared at the beginning of this stimulus program that it would be focused on infrastructure and would in principle not direct stimulus funds to industry at all. Outside observers took note of these principles. But as the GFC worsened, governments everywhere increased their stimulus policies, including programs to support industry, both emerging sectors and hard-hit traditional industries. China was no different (as described in Chapter 3.3.2.), and the result was that aggregate resource flow into industrial policy soared. After the GFC, though, most developed market economies dialed back their stimulus efforts, including both their emergency aid to troubled companies and their support for promising technologies of the future. At this point, China went its own way. It consolidated its industrial policy initiatives, gave them a new rationale (strategic emerging industries), and made an unprecedented national commitment to running sectoral industrial policies. For China, this was the "lesson" of the GFC: robust and decisive government intervention could and should complement the market economy. Both the policy orientation and the resource commitment had by this time changed completely from what it had been a decade earlier.