



The New Face of Chinese Industrial Policy: Making Sense of Anti-Dumping Cases in the Petrochemical and Steel Industries

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The New Face of Chinese Industrial Policy:

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Abstract: Why have China's petrochemical and steel industries behaved so differently in seeking trade protection through antidumping measures? We argue that the patterning of antidumping actions is best explained in terms of the political economy of economic restructuring in pillar industries and its effect on industry structures. In the petrochemical industry, the shift toward greater horizontal consolidation and vertical integration reduces the collective action problems associated with antidumping petitions among upstream companies. It also weakens downstream companies lobbying in favor of the general protection of highly integrated conglomerates. In the steel industry, by contrast, national industrial policy in the absence of exogenous economic shocks fails to weaken local state interests sufficiently. Fragmented upstream and downstream channels instead persist, with strong odds against upstream suppliers waging a successful defense of material interests.

The idea of trade liberalization as a more efficient means of national economic development has been at the center of an important shift in the role of national governments in setting industrial policy. Rather than “picking winners” and protecting infant industries, reducing tariffs and other barriers to international trade took center stage. But national governments still have an important role to play in assuring that the economic interests of domestic industries are not compromised through the unfair trade actions of international competitors.

Anti-dumping (AD) measures remain a critical arena for such government advocacy. Now operating within the framework of the World Trade Organization (WTO) and national law, such measures begin with the initiating petition of firms alleged to be injured. Worldwide, the steel and petrochemical sectors continue to be primary targets, accounting for 29 percent and 20 percent of total AD investigations respectively between 1995 and 2009.

Since the creation of the WTO in 1995, China has been the top target of AD measures worldwide with 761 Chinese products being investigated between 1995 and 2009. Developing countries, India especially, have initiated the majority of cases. Consistent with the global trend, China’s steel and petrochemical products are also the top two targets of AD investigation. They account for 23 percent and 20 percent of total AD investigations respectively initiated by other countries (WTO 2010).

China’s own use of AD investigation against imports, in contrast, has been relatively modest until recently. As the second largest import market, China is only the fifth most frequent user of AD tools with 178 investigations being initiated and 130 measures being imposed between 1998 and 2009 (WTO 2010). While tempting to believe that China is using AD tools solely for strategic purpose, including retaliation against countries taking AD actions against its own exports, the actual pattern of China’s AD investigations against imports begs for a different explanation. A stunning 66 percent of China’s AD investigations were directed against petrochemical imports. The

steel industry, in contrast, only initiated 5 percent of AD investigations during this period (Bown 2010).

Given this, the use of AD tools in China seems driven by something other than retaliation or even national industrial strategy. After all, the Chinese government identifies both the petrochemical and the metallurgy sectors as “pillar” industries or key sources of economic growth, strategic competitiveness, and conceivably then equally worthy of protection (Lin 2008, Sun 2007). Over the past few decades, the petrochemical and metallurgy sectors have been targeted for numerous restructuring initiatives and government aid, including subsidies and credit which aim to enhance their international competitiveness.

Indeed, large state-owned enterprises (hereafter SOEs) remain the dominant AD petitioners in both industries. Concretely, as shown in Table 1, 42 out of 57 AD petitioners in the petrochemical industry were SOEs or corporations controlled by the state. Further, more than half of them are subsidiaries of four largest conglomerates. In the steel industry, all six petitioners were SOEs, with five of them being directly controlled by the central government. Nonetheless, as Table 1 shows, petrochemical producers are better able to muster their defenses than those in the metallurgy sector. How are we to explain this outcome?

(Table 1 about here)

In this paper, we argue that AD investigations, or lack thereof, are best explained in terms of the political economy of economic restructuring in China and its effect on a domestic industry’s structure. Concretely, we show that national industrial policy in the absence of exogenous economic shocks fails to weaken local state interests sufficiently enough to facilitate industrial consolidation along the lines which Beijing intends. Fragmented upstream and downstream channels instead persist, with strong odds against upstream suppliers being able to wage a successful defense of material interests. In other words, rather than serving as a defense against

global competition, strong local interests in China seem to be facilitating it. They do so by getting in the way of the kinds of industrial consolidation which seem necessary to wage successful battles through anti-dumping mechanisms.

Building off this, we find that the patterning of AD investigations in China is best explained in terms of whether the central government was able to restructure designated priority industries in its preferred direction, meaning greater vertical integration and strengthened central state control. Where successful, resulting industry consolidation reduces the collective action problems commonly associated with AD petitions in upstream industries, particularly as too many players make it hard for any one firm to demonstrate injury. Such consolidation also weakens downstream industry lobbying in favor of general protection for highly integrated conglomerates. This integrated structure now exists in the petrochemical sector. It remains woefully absent in the metallurgy sector where a highly fragmented market structure persists to the great frustration of Chinese policymakers.

For this reason, patterns of AD investigations in China over the past decade or so should not be read as mere protectionist reaction to a WTO-mandated liberalization of tariffs (Bown 2007) or even “politics-as-usual” in U.S.-China economic relations. We contend instead that existing *patterns* of AD investigations in China mainly reflect how firms may respond to economic challenges in the context of structural constraints. In so doing, our point is not to dismiss a role for economic or political interests as motivating factors, but rather to suggest that in their own right they cannot explain fully the patterns which exist.

Our finding on the effect of industry structure extends current work on the political economy of business-government relations and trade policy in China in three important ways (e.g., Steinfeld 1998; Zeng 2004; Kennedy 2005; Mertha 2005; Tsai 2007). First, we demonstrate that domestic business interest groups can influence state policy outcomes in China. Second, we show

that their ability to do so is closely related to resolution of collective action problems. Finally, by focusing on the root cause of divergence between central government policy goals and industry structure, our research makes explicit that de facto Chinese industrial strategy is a far less coordinated political outcome than the increasingly popular idea of “China, Inc.” suggests.

To make our case, the paper consists of six sections. The first section reviews related literature on sources of variation in AD actions. The second section compares major characteristics in China’s steel and petrochemical industries, assessing how well existing literature explains their distinct pattern of AD petitions. The third section presents the institutional framework of China’s own antidumping law, illustrating why it works against fragmented upstream industries. The fourth section discusses the evolution of state sector in China’s economic restructuring, explaining why SOEs have been so dominant in using AD measures. The fifth section discusses how features of the Chinese state bureaucracy impinge on the government’s industrial consolidation goals. Against this backdrop, we find that exogenous shocks, something which is typically depicted as unhinging national development goals, appear instead the unintended friend of industrial policy planners in China. The last section is the conclusion.

Industrial Variation in Antidumping Actions: Existing Explanations

What explains industrial variation in the pursuit of AD protection? Much like related literature on trade policy preferences, AD actions are largely explained in the international political economy and economics literature in terms of material interests. Firms with extensive international linkages, for example, are found to prefer lower trade barriers (Milner 1987, Hathaway 1998), while an increase in import penetration increases incentives for import-competing domestic industries to lobby for protection. In addition, strategic intentions, problems of collective action, and the distributional consequences of AD duties have been shown to influence patterns of AD actions.

First, turning to strategic intentions, some studies have found that the cost of retaliation trumps assumed benefits of AD protection against an import-competing product. Conversely, export-oriented industries may demand retaliatory protection as a means to pry open foreign markets (Milner & Yoffie 1987, Gawanda & Hansen 1999). Likewise, it is not uncommon to see a country using AD tools in a “tit-for-tat” fashion to retaliate against attacks on its own domestic firms or oppose cases filed against countries that are important export markets (Prusa & Skeath 2001, Blonigen & Bown 2003).

Second, collective action problems may prove too daunting, diminishing a firm’s incentive to lobby for protection. AD measures, after all, are collective goods of a sort but the burden of expending resources to procure this trade relief usually falls on a few firms only. In most countries, petitioners for AD investigations typically must represent a major portion of a domestic industry. In this way, they demonstrate ‘injury’ to a sector, and not just to a given firm. These terms, however, are not so easily achieved in markets where no firm dominates market share or can easily monitor others. Fragmented markets also lower the cost of free riding, making any given firm all the more hesitant to foot the heavy bills associated with filing a case and collecting evidence. Supporting this, Busch and Reinhardt (1999) find that geographically concentrated industries tend to exhibit greater political motivation and receive relief from imports because spatial proximity bolsters capacity for collective action. Goldstein and Martin (2000) also find that when a given firm knows that their lobbying for protection will work, they are more willing to bear a higher cost to resolve collective action problems. Supporting this finding, it appears that large firms are more politically active, and also benefit disproportionately from governmental protection (Schuler 1996).

Finally, the distributional consequences of AD duties have been shown to determine an industry’s demand for protection. When such transactions are mediated through market-based contracts, buyers and sellers within the same sector often have conflicting interests. Resulting AD

duties, for example, offer private gains to domestic upstream producers, but at the expense of downstream industries and consumers. Looking at the petrochemical and steel industries in particular, Krupp and Skeath (2002) find that the negative effect on downstream industries was indeed substantial, particularly given the importance of steel and petroleum as intermediate inputs. For this reason, downstream producers have every reason to lobby hard against AD protections. They are, after all, left to bear the cost in terms of narrowed profits and in the worst case in the form of layoffs and firm closures. Hoekman and Leidy (1992) do also find, however, that downstream sectors will support upstream protection if it significantly increases the probability that the downstream sector will gain protection in return. No matter how downstream agents behave, Sleuwaegen et al. (1998) find that upstream industry AD petitions are more likely when concentration in the downstream industry is low.

Pulling these pieces together, existing literature predicts that only industries with a small number of lead upstream producers can wage successful battles against imports for three reasons. They can best overcome industry-specific collective action problems, are best able to establish “injury,” and seem most willing to bear the uneven costs associated with pursuit of an AD petition.

More broadly, existing literature makes clear that a firm’s understanding of appropriate industrial strategy is a dynamic outcome, which relates to how a firm understands the political basis of its position within both domestic and global supply chains. For this reason, the composition of economic interests is irreducible to objective material conditions. As Woll (2008) notes instead, governments have a role to play, influencing how a firm understands its economic interests, and consequently the position to take on trade liberalization and other international political economic issues. The China case makes this point especially clear.

Common Pasts, A Divergent Present: The Petrochemical and Steel Industries

How well do the above factors explain AD actions in the Chinese steel and petrochemical industries? At first glance, positional differences in global markets seem critical. China's status as a net steel exporter and net petrochemical importer could have led the former to resist AD actions, while the other pursued it vigorously over the past ten to twelve years. Table 2 indicates, however, that their structural economic positions were in fact rather similar before 2006. Both industries had imported significantly more than they exported. A 90 percent increase in steel exports between 2005 and 2006 dramatically shifted the steel industry from a net importer to a net exporter. Prior to this, the steel and chemical industries experienced import surges between 1999 and 2003 (Zeng 2007).

(Table 2 about here)

Despite these similarities and later shifts in international exposure both industries have been consistent in their pattern of AD petitioning over the past decade. As such, import penetration alone does not fully explain patterns of AD cases. At best, the degree of penetration strongly indicates a material interest in protection, but in no way fully predicts behavior. In fact, the petrochemical and steel industries both faced tariff reduction schedules as a part of China's WTO accession. Nonetheless, AD petitions in the petrochemical sector quickly became far more prevalent.

The national government, as both as majority shareholder and market regulator, plays a heavy role in both sectors as well, particularly in upstream firms. Elsewhere, this pattern is associated with strong protectionist impulses, including AD petitioning against related imports. Indeed, Chinese steel and petrochemical goods have been the subject of a large number of AD investigations in other countries. Yet predicted industry-driven retaliatory impulses have not unfolded in China to degrees found elsewhere.

The geographic distribution of China's steel and the petrochemical industries also does not mirror predicted trends. In terms of the share of top five provinces in total industrial output, steel production (55 percent) is more geographically concentrated than petroleum processing (46 percent) but less so than the chemical products (60 percent), as shown in Table 3. Moreover, coastal provinces Jiangsu, Shandong, Shanghai, and Liaoning all have large bases in both the steel and petrochemical production but firms within these provinces have not been significant players in AD petitions. All to say, geographical concentration does not seem to be the driving factor behind AD action within China's steel and petrochemical industries

(Table 3 about here)

We find instead that industry structure, understood as both ownership form and degree of vertical integration, is relevant. Much like other sectors, both the steel and petrochemical industries in China were historically dominated by SOEs. Their shares declined steadily as a result of China's de facto privatization policies underway since the mid-1990s. SOE share in the petrochemical industry revenue dropped from 66 percent in 1999 to 44 percent in 2008. During that same period, SOE share of total steel sector revenues dropped even more rapidly, going from 74 percent to 44 percent, as shown in Table 4.

(Table 4 about here)

Several distinct features emerged alongside this process of declining state ownership. To begin, the petrochemical industry, while having four times as many companies as the steel industry, continues to be dominated by four distinct, vertically-integrated state-owned corporations—China National Petroleum Corporation (CNPC), China Petroleum and Chemical Corporation (Sinopec), China National Offshore Oil Corporation (CNOOC), and Sinochem Group.¹ These giant

¹ While all these four giants are integrated conglomerates which have a wide range of businesses, they have different advantages inherited from their SOE predecessors: CNPC is the largest oil and gas producer; Sinopec is the largest refining and petrochemical producer; CNOOC is the largest offshore oil and gas producer; Sinochem is the largest petrochemical trading corporation.

companies not only operate the vast majority of China's refineries, but also produce much of China's oil and largely control the retail distribution of gasoline. Their revenues account for more than half of revenues of the entire petrochemical sector, yielding to a de facto oligopolistic market structure.

The steel industry is a rather different story. As of 2008, there were over 8,000 steel companies in China. Most of these companies, however, are private and scattered throughout to nearly every province of China. Although of small and medium-size scale, these newer firms have continuously chipped away at the central government's goal of industry consolidation. In terms of industrial output, the steel industry is only 20 percent smaller than the petrochemical industry, but the total revenue of Baosteel, China's largest steelmaker, is only 14 percent that of Sinopec, the largest petrochemical company.² In fact, while output shares of the four largest steelmakers were never especially high, now it has now considerably declined, going from 33 percent in 1988 to 22 percent in 2008.

A less noticeable but critical difference is the degree of vertical integration existing in each sector. Such vertical consolidation enhances an industry's power within a given market, partly as it harmonizes interests between upstream and downstream firms (Williamson 1971). Following a standard approach of its calculation (i.e., Fan 2000), we use commodity flow information in the Input-Output Table of China to measure the degree of vertical integration between upstream and downstream industries in each sector. For each pair of industries i and j , the input-output accounts report the value input from industry i in producing industry j 's total output. A larger input-output ratio indicates a higher degree of vertical integration between i and j as there is more use of input i in the production of output j . Since our focus is domestic firms, we only report the value of domestic intermediate input used in producing outputs in the downstream industries.

² In 2009, the total revenues of Sinopec and Baosteel were RMB 1392 billion and RMB 195 billion respectively.

As shown in Table 5, important differences unfolded in the steel and petrochemical industries between 1995 and 2002. Namely the IO ratio increased in five out of seven downstream industries in the petroleum and chemicals industries, while decreasing in six out of eight downstream industries in the steel industry. In other words, the upstream petrochemical industry became more integrated with its downstream industries whereas the steel industry became increasingly disintegrated with its downstream industries.

(Table 5 about here)

In the case of China's petrochemical industry, the distribution of SOEs within the sector added to the industry's power. Today, the state holds the stakes in the upstream segment, with 46 national key SOEs (*guojia zhongdian qiye*) enjoying political and fiscal privileges from both the central and provincial governments. The petrochemical downstream industries, however, only have 43 national key SOEs.

The situation is just the opposite in the steel industry where the influence of SOEs is more prevalent in downstream industries. At present, 103 national key SOEs are located in such steel-consuming industries as automobile, machinery equipment, electronics, and construction. Each industry is adversely affected by AD duties imposed on imported steel products. In contrast, the steel industry itself only has 33 national key SOEs.

(Table 6 about here)

The concentrated petrochemical industry faces segmented and distinct downstream markets, but with the benefit of considerable industry consolidation. Highly integrated petrochemical firms, in turn, may use their power over unaffiliated downstream firms. The steel sector, in contrast, has a fragmented and disintegrated upstream, no match for fairly strong downstream industries. In next section, we explore how industrial structure affects Chinese firms' use of AD measures through a review of China's AD regulations and institutional arrangement.

Institutional Framework for Antidumping Investigation in China

China began to implement its own AD regulations in 1997. The initial regulations were replaced in 2001 to bring them into conformity with WTO obligations. These regulations were amended again in 2004 after a major administrative restructuring. Now the investigation of AD measures is primarily conducted by the newly created Ministry of Commerce (MOFCOM), but AD enforcement still requires a complex coordination among various government agencies.

Within MOFCOM, two internal agencies are involved in an AD investigation: the Bureau of Fair Trade (BOFT), responsible for the determination of the dumping margin; and the Investigation Bureau of Injury to the Industry (IBOII), responsible for the determination of domestic injury.³ Both bureaus determine causation, but the BOFT is the agency responsible for taking the decision to initiate an investigation.⁴ MOFCOM is also responsible for the termination and imposition of provisional duties, or the acceptance of a price undertaking.⁵ The Tariff Commission under the State Council is responsible for the adoption of definitive antidumping duties. Finally, the Customs General Administration collects the duties.

China's AD regulations closely resemble international counterparts as well as procedures found in the WTO Antidumping Agreement. That is, a domestic producer makes a request to the relevant authority to initiate an AD investigation against a foreign producer on behalf of an entire domestic industry. The term "domestic industry" refers to those domestic producers of "like

³ Prior to March 2003, AD determinations were made by the Import and Export Fair Trade Bureau of the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) and injury determinations by the Industry Injury Investigation Bureau of the State Economic and Trade Commission (SETC).

⁴ Most developed countries make a division between the determination of dumping and the determination of injury and the calculation of dumping margins. For example, in the U.S., the Department of Commerce investigates dumping while the International Trade Commission investigates injury.

⁵ Price undertakings, as a means of limiting import, are used by a government to pressure a foreign firm to raise the export price in order to avoid the imposition of AD duties on its sales. It has replaced voluntary export restraints as a primary policy tool since the 1990s.

products” within China. The collective output of the petitioning firms needs to constitute a “major proportion” of the total production of “like products,” thus establishing the petitioners’ representativeness of an industry.⁶ In practice, this means at least 25 percent of a domestic industry must support the petition and at least 50 percent of the industry must not oppose it. If the domestic industry is fragmented and includes a large number of producers, MOFCOM may examine the standing of the applicant by using statistically valid sampling methods to determine industrial representativeness.⁷

The government then investigates the foreign producers to determine if the allegation is valid. A valid allegation proves such dumping as well as the existence of injury to domestic industry. The causal link between dumping and injury is determined by the reduction in the market share of domestic producers and significant undercutting of price by foreign exporters. Drops in domestic manufacturer prices or possibly the prevention of price increases that ought to have occurred as a result of domestic production cost are sample indicators of injury. The designated authority may initiate action when these conditions exist. The AD duty imposed under the regulations is effective for five years from the date of imposition, unless revoked earlier.

In practice, China’s AD investigation and enforcement decisions afford great discretionary power to the government, with many implementation details subject to case-by-case practice and guidelines (Messerlin 2004). Article 56 of the AD regulations, for example, grants the Chinese government the authority to use countervailing measures against ‘discriminatory imposition’ of antidumping measures by other countries. Even though this provision has rarely been invoked, its very existence gives the Chinese government the ability to push against AD investigations that target China for non-economic reasons (Choi & Gao 2006). China’s non-market economy status

⁶ An important issue is that China has modified the definition of “domestic” and “foreign” industry to be consistent with WTO requirements. Because the law is aimed at protecting firms that produce within China’s borders, foreign-invested companies, even wholly foreign-owned enterprises, can apply for relief. (Kennedy 2005, 419)

⁷ Provisional Rules on Initiation of Anti-Dumping Investigations, Article 7

within the terms of its WTO accession also makes Chinese companies especially easy targets.⁸ In such trade disputes, they are likely to be found in violation, and partly as a result of what third country is chosen as a proxy for Chinese production costs.

Given this, AD law and related investigations are never too far from political considerations. They range from a country's interest in their reputation as a fair trader to the all-too-common slap of retaliatory duties. In China's case, there is an added layer to these political considerations that says something about its past and continued recognition that regime legitimacy is closely connected to its ability to maintain the country's economic well-being.

In fact, a public interest clause was added to the 2004 amendment of China's AD regulations, allowing that "interested parties" to an AD action may include reference to the public's interest in evaluating a petition. The point here is that officials are expected to take into consideration not only domestic producers who claim injury from imports, but also the consequence of AD duties on other economic actors should they be imposed.

Such recognition allows national economic goals to remain front and center. That is, at least officially, the public interest clause makes AD decisions less biased in favor of domestic producers, as the benefits of AD measures to primary-line producers can be outweighed by losses to downstream producers and consumers. In turn, even if dumping, injury, and causation are all found to exist, the government might not impose AD measures if the sale of the targeted products conforms to the Chinese public interest. With no specific operational rule on how public interest should be considered in AD investigations or of what conclusions should be drawn, the public interest clause opens a direct channel for industrial lobbying to play a legitimate role in the AD

⁸ A report conducted by the U.S. Government Accountability Office (GAO) suggests that the "nonmarket economy" status has imposed disadvantage on Chinese products when facing AD investigations. The U.S. Commerce's methodology for calculating AD duties on nonmarket economy products differs from its market economy approach in two parts: (1) it uses price information from an appropriate market economy country (surrogate country) to construct a normal value of the imported products and (2) it limits eligibility for individual rates to companies that show their export activities are not subject to government control. See GAO 2006.

process. In some cases, firms in both upstream and downstream industries are invited to present their opinions during the course of an AD investigation.⁹

China's AD regulations, in other words, encourage firms to pursue activities that procure the government's protection. We find that vertically-integrated domestic oligopolists are particularly well equipped in this regard as they have strong standing on two fronts. These firms are leading agents of national economic development, and thus strongly positioned to claim standing as the public's interest. By virtue of their market share and scale, they also have an easier time establishing standing as representative of a "whole industry" claiming injury.

On these very grounds, foreign companies operating in China can also win the government's support, whether operating upstream or downstream. BP China, for example, presents itself as playing a critical role in China's energy security. Downstream foreign firms link their ability to produce low cost finished products with China's competitiveness in the global marketplace. Today, no small number of foreign firms also claim membership in Chinese trade associations, using their position to shape legislation right alongside their domestic counterparts.¹⁰ In fact, foreign companies have a surprisingly high rate of victory (dismissed AD cases) and partial victory (light penalty), making arguments of systematic anti-foreign bias hard to sustain at least in this policy realm (Kennedy 2005).

Either way, foreign or domestic, the story is the same: powerful businesses in China are those which serve government ends. For this reason, it seems a reasonable prediction that China's SOEs would embrace the central government's long-standing call for greater consolidation and vertical integration. Turning to the metallurgy and petrochemical industries tells a rather different story, one wherein firms have defined their strategies of survival in the context of their immediate political environment and its ability to protect them. Turning to this dynamic and its effect on the

⁹ Author's interview, Bureau of Fair Trade, Ministry of Commerce, Beijing, July 3, 2009.

¹⁰ One example is Sealed Air, a global packaging company, which in its role as a member of China's Meatpackers Association has been at the forefront of pushing for greater food safety requirements in China.

patterning of AD actions, we argue that exogenous shocks have played an important, if unacknowledged role in shaping trade politics in China today. Concretely, they open the way for industrial consolidation within a sector, which otherwise is thwarted by the tight alignment of local state and business interests.

In next section, we look broadly at economic restructuring policies in reform era China, showing how they well positioned Chinese SOEs to benefit from AD regulations.

Remaking the Commanding Heights: Economic Restructuring in Post-1978 China

Economic restructuring in post-1978 China in many ways might be read as an attempt to do away with the aftermath of economic autarky which had earlier prevailed. Celebrated in the Maoist era, the self-sufficiency of economic units also led to a good deal of inefficiency. The industrial sector, in particular, was plagued with duplication, outdated technologies, surplus employees, and a shortage of supplies and lack of economics of scale.¹¹ Decades of protection also meant that little attention had been paid to issues of quality control and innovation. As a result, both provincial and central state-owned industries were poorly equipped to respond to market forces.

For much of the 1980s and early 1990s, township-and-village-owned enterprises (TVEs) operated instead as the industrial engines of China's economic development. Their reasons for success also made clear that China's system of economic governance was itself a cause of economic fragmentation. As a source of economic growth, employment, and local tax revenues, TVEs enjoyed considerable protection. Provincial and sub-provincial governments shielded them from non-local competitors, along with SOEs under their jurisdiction.

At the same time, Chinese economic planners were eager to achieve economies of scale and greater vertical integration in leading sectors, ultimately pushing for the creation of business groups.

¹¹ For a general review see Brandt, Rawski and Sutton (2008)

By 1991, 7,000 such groups existed. They were mostly in the form of lend-lease and sub-contracting relations between rural and urban industries, which did little to alter their relations with local and provincial government officials (Nolan 1996). Moreover, without accompanying reforms that addressed the historical role of SOEs, including their provision of housing, pensions, and lifetime employment, the central government's goal of industrial rationalization, including bankruptcy in some cases, could not move forward.

In the early 1990s, local and provincial governments also had little reason to heed such calls. Local industries, including those in petrochemicals and steel, benefitted from price controls and easy access to bank credit, making them a sure bet for local economic development. Local state actors, in other words, had every incentive to create small and medium-sized firms under their direct control. By 1994, however, market and non-market pressures began to build, shifting the investment decisions of local government officials. Specifically, greater control over the distribution of credit and improvements in fiscal capacity strengthened central government capacity to “pick winners” and save losers, if desired. With this, mergers and acquisitions got underway; along with talk of building national champions becoming ever more prevalent (Nolan 2001).

Under the slogan of *zhuada fangxiao* (Grasp the big, let go of the small), Beijing combined the privatization of industries with little national security or fiscal importance with the creation of state-dominated, oligopolistic shareholding concerns in strategic industries. A stunning 80 percent of small and medium-sized collective enterprises (SMEs) changed their ownership status in the mid 1990s through corporatization, shareholding, or shift to private management (ADB 2007). All the same, firms having the state as majority shareholder were expected to play a leading role in the economy.

The strategy of “*zhuada fangxiao*” reflects Beijing's long-held belief that government is best suited to run the commanding heights of the economy. As a first step, in 1994, the central

government chose 100 big and relatively productive enterprises to experiment with the creation of a modern enterprise system. These entities, most of which were spun off from the ministries that “owned” them under the system of central planning, were now given greater autonomy in drafting economic plans, financing their operations, and engaging in foreign trade. They were also corporatized with the state as the dominant shareholder.

The central government later expanded the number of these experimental enterprises to 300 and provided them a guaranteed credit line and discounted interest rate from state commercial banks (China Industry News 2008). In 1999, the list was expanded again, with 520 national key SOEs selected from 26 industries. These SOEs accounted for about half of the assets (55%), outputs (43%), profits (48%) and taxes (45%) of China’s industrial sector in 1999 (National Economic and Trade Commission 2000).

Of the 520 national key SOEs, 196 central SOEs (*zibongyang qiye*), which dominated the lifeline industries (*mingmai hangye*) of the Chinese economy, became the state’s top priority. They were supervised by a newly created State Asset Supervision and Administration Commission (SASAC). Through state-owned holding companies that retain dominant shares of these key SOEs, SASAC directly controls managerial and board selection and all financial, legal, and corporate structure issues for these giant firms (Naughton 2006). The goal was to “make state control more efficient and state enterprises wealthier and more effective at carrying out parallel imperatives of the party-state” (Pearson 2007, 720).

Upon its establishment in 2003, SASAC developed a performance evaluation system to rank each central SOE in relation to their reference industrial sector (SASAC 2006). Largely through this evaluation system, SASAC indirectly reinforces the elite status of central SOEs by forcing them either to become the dominant firms in their sectors (e.g., become the top three firms) or to be taken over (Naughton 2005). By the end of 2009, the total numbers of central SOEs had

shrunk to 129 as some smaller and less efficient SOEs were either disbanded or acquired by larger ones. SASAC plans to reduce the total number of central SOEs to 100 by the end of 2010, which means at least 29 more companies will disappear in 12 months. At the provincial level, there are 1,028 key SOEs controlled by local SASAC under a similar ownership structure (Huang 2008).

While Beijing has denied publicly that it intends to reassert control over large swathes of the economy in response, the tendency of “*Guojin mintui*” (the state advances, the private sector recedes) has become increasingly evident (Li 2006). The economic performance of central SOEs has been important in this respect. In 2002, the year before SASAC was established, 196 central SOEs had 7 trillion RMB assets and earned 240 billion RMB of profits. In 2009, 129 central SOEs had 21 trillion yuan assets and earned almost 1 trillion yuan profits (SASAC 2010). The Chinese government plans to create 30 to 50 internationally competitive enterprises groups (China Daily 2006). More recently, faced with the global economic crisis, Vice-premier Zhang Dejiang reportedly urged SOEs “to further expand domestic and international markets... assume the responsibility and continue playing the leading role” in the economy (Financial Times 2008).

Of interest for our purposes is the government’s systematic and consistent effort to make Chinese SOEs globally competitive through greater consolidation within sectors, changes in firm governance, new government regulatory institutions, and changed reporting relationships. The policies so mentioned, if successfully implemented, address the collective action problems that commonly prevent AD petitions from advancing, and offer an alternative point of entry into understanding the pattern of AD actions in China over the past decade or so.

Getting it Right: National Industrial Policy and Economic Interests

In many aspects, the Chinese government’s strategy in promoting consolidation in designated priority industries was very similar to that of Korea (Chang 1993, Huang 2002) in that

governments often initiated or subsidized mergers and takeovers in order to create “national champions.” There is one key difference, however. SOEs rather than private firms are the primary targets of industrial consolidation in China. Thus, while the private sector has become the main engine of China’s economic boom and source of most international trade, it is the state sector which continues to have considerable status in the central government’s vision of national economic security and development. Given that the central government has pulled together an impressive array of administrative and financial mechanisms to encourage cooperation, it also seems reasonable that local state government and enterprise agents might see their own prosperity and survival in relation to satisfying demands from above. Nonetheless, resistance to the central government’s policy agenda and on-going fragmentation has been the distinguishing feature of the steel sector over the past decade. Steel firms, in turn, remain to this day poorly equipped to counter-balance powerful downstream interests which favor competitively priced inputs above all else. Consolidation of the petrochemical sector, in contrast, has allowed lead firms to protect themselves against foreign competition.

The above contrast begs the question of just how Chinese firms understand their economic interests, and what allows those interests to shift. We argue that exogenous shocks have a critical role to play. They need to be considered for two reasons.

First, exogenous shocks deeply constrain a local government’s ability to protect area businesses as they now face forces beyond their control. These shocks also possibly worsen matters by encouraging local state predatory action in response to declining economic conditions. With this change, the channel for central government agents to pursue industry consolidation goals only expands. Once viewed with hostility, mergers and acquisitions, as well as other shifts in local enterprise ownership, are a means of survival for firms in tough times.

Second, exogenous shocks have the ability to undercut government legitimacy with great efficiency, serving as a stiff reminder that national champions are a channel to economic and political security. As a result, the central government's drive toward success in this endeavor is a persistent feature of government-business relations in China. Both petrochemical and steel industries are considered strategically important industries, but the government initially put the former ahead to address energy security concerns.

Starting with the 8th Five Year Plan (1991-1995), the petrochemical industry was categorized as a pillar industry, guaranteeing it wide-ranging administrative and financial support from the government. In December 2006, SASAC laid out seven industrial sectors over which the government should retain "absolute control." The petrochemical industry, along with coal, electricity, defense, telecom, air transport and ocean shipping, was again included as a priority of national economic security. The year prior, in 2005, the government also established a leading group focused on national energy, led by premier Wen Jiabao which aimed to improve coordination across industries and ministries. In 2008, the Leading Group on National Energy was replaced by the National Energy Commission (NEC) to enhance energy governance and make it more transparent.

The Chinese government has consistently pursued the goal of self-sufficiency in the steel sector, but it never regarded the sector as one where the central government retained "absolute control." Government encouragement had been given instead to the development of SOEs as "heavyweights" in the industry, in effect proposing an indirect control mechanism (China Daily 2006). These seemingly nuanced differences imply that the central government did not devote the same effort to promote giant conglomerates within the steel industry as was the case for petrochemicals. Much however has changed, and in ways that make explicit the relation between exogenous shocks and the central government's ability to constrain local state agents. We next turn

to the interaction effects of exogenous shocks, central and local government relations, and business interests to explain the divergence of industrial restructuring in these leading sectors.

Restructuring in the Steel Industry:

Beginning with the Great Leap Forward, the Chinese government had supported a high degree of autarky in steel manufacturing. Much of it, however, was not suitable as inputs for manufacturing higher value-added goods. The onset of economic reforms, however, gave new impetus to local governments to develop and control a captive source of steel to advance local industrial development and manufacturing. China's existing regulatory apparatus unwittingly aided these efforts through a joint administrative structure that allowed local governments to maintain a fair degree of control.

Adding to this, in 1998, the government downgraded the Ministry of Metallurgical Industry (MMI). It had been the central line ministry for the steel industry, but was changed to a state bureau affiliated to the State Economic and Trade Commission (SETC), the powerful super-ministry responsible for industrial policy creation. At the same time, operational control of all but the four major steel SOEs (Baosteel, Ansteel, Wusteel, and Pansteel) were handed over to local governments (Sun 2007).

This devolution of economic powers encouraged local officials to pursue their own developmental goals. In the 9th and 10th Five-Year plans period (1996-2005), 19 provinces prioritized the steel industry as the pillar industry to promote local economy (Xu & Han 2006). At the same time, the central government's policy of capacity rationalization and industry consolidation within the industry was ignored. Large-scale mergers and takeovers were all-too-rare throughout the 1990s and early 2000s, especially inter-provincial deals.

Interestingly, the central government began its consolidation efforts with the assumption that market forces would unhinge local state power, when instead rising domestic and international market demand served only to strengthen it. Specifically, in 1994, the central government freed steel prices, with hopes that economies of scale might organically emerge. At the same time, the central government continued to set guidance prices for main steel products, partly to restrain inflationary pressures (Noland & Yeung 2001). By the late 1990s, domestic prices fell well below global price levels, fueling Chinese steelmakers to expand export capacity at a furious clip.

(Figure 1 about here)

During the decade between 1997 and 2006, steel production quadrupled and outstripped demand. Concerned about the over-expansion of steel capacity, the State Council promulgated China's Iron & Steel Development Policy in 2005, again calling for industry consolidation through mergers and acquisitions. This policy was only the second industry-specific development policy to appear in post-reform China, having been announced the year after the automotive industry development policy. A key objective was to increase the concentration of steel production by large SOEs. Article 20 specifically called for a strategic reorganization of China's largest steel producers. The goal has been to have two 30 million-ton and several 10 million-ton level "internationally competitive" business groups emerge within several years time. No less ambitious is the goal of having the ten largest companies account for 50 percent of total production by 2010 and 70 percent by 2020 (Xinhua 2005).

In the face of rising global demand, implementing the policy proved more difficult than expected. For example, Shanghai-based Baosteel, China's largest steelmaker, early on aggressively sought out merger targets. In 2004, talks were underway with Ma'anshan Steel in Anhui, Handan Steel in Heibei, and Baotou Steel in Inner Mongolia in 2004. In each case, provincial government

officials stood in the way.¹² In fact, since 2005, completed mergers mainly occurred within provincial borders as shown in Table 6.¹³

(Table 6 about here)

In effect, economies of scale within the steel sector happened, but not in the direction intended by the central government. Local governments instead found their bargaining power strengthened in ways that implicated China's economic relations with the world.

To begin, ever lower prices meant that steel exports from China expanded rapidly. In response to growing complaints from trade partners around the world, the Chinese government cut steel export rebates eight times between 2004 and 2007 (China Trade Remedy Information 2007). Nonetheless, steel capacity continued to expand, reaching 500 million tons at the end of 2008, or what some have estimated as 100 million tons of overcapacity (Guangzhou Daily 2009).

The rapid expansion of steel production also forced Chinese steelmakers to strike deals with foreign suppliers to ensure steady sources of iron ore. As the biggest buyer of iron ore, China should have had considerable leverage in negotiations, but here again the failure of the central government to consolidate the steel industry resulted in a serious misalignment of its own interests and those of leading steelmakers in China.

To elaborate, the contracted price for imported iron ore is the result of an annual negotiation between China's lead steelmakers (e.g., Baosteel) and the big three miners, Rio Tinto, BHP Billiton and Vale. Once concluded, China's 100 largest steelmakers are permitted to import iron ore at this contracted price. The majority of Chinese steelmakers, in other words, can only purchase ore on the domestic market at much higher spot-market prices.

¹² Anhui provincial province promulgated a "Guideline for Adjusting and Developing Iron & Steel Industry" in May 2009, indicating that it has no interest in seeing its largest steelmaker merged by Baosteel. Thanks to the push by Hebei provincial government, Handan Steel was finally merged with its local rival Tangshan Steel in 2008 (Nanfang Metropolitan News 2009).

¹³ The formation of Anben Steel, through the merger of two giant steelmakers Anshan and Benxi, had been delayed and was eventually implemented in 2005 primarily because they were pushed and coordinated by the same local government in Liaoning province.

Given this, the largest steelmakers expend more energy securing a hefty import quota than they do on ensuring the lowest possible contracted price. They do so knowing that a steady stream of profits awaits them through the arbitrage of “leftover” iron ore, sold to smaller domestic steelmakers at spot-market prices (Yu & Hu 2009). As became well known through the Stern Hu-Rio Tinto case, smaller steelmakers not entitled to import iron ore directly, and unhappy with the discrimination, began to unite themselves and negotiate with the foreign miners privately, ultimately undermining the bargaining power of the Chinese steel industry (Studwell 2009).

Industrial Restructuring in the Petrochemical Industry

The petrochemical industry experienced a similar path of decentralization in the late 1980s and early 1990s. The dismantling of the Ministry of Petroleum in 1988 and the Ministry of Energy in 1992 basically left local governments with primary control of oil fields and petrochemical companies in their territories. Local officials, with their entrepreneurial mindset, invested heavily in refinery and petrochemical units to expand production. External price shocks, however, had a dramatic impact, aiding in the consolidation of the petrochemical industry.

Like steel prices, oil prices had long been controlled by the government and were kept well below global price levels. The global oil price plunge in the mid 1990s, combined with a downward trend in the domestic economy, drove both upstream (oil and gas production) and downstream (refineries and petrochemical production) in the petrochemical industry into fiscal hardship and forced them to adjust. Indebted local governments, unable to exploit financial resources to bail out local SOEs instead became more predatory toward them (Lin 2008).

This situation gave the central government the opportunity needed to regain its control and reorganize the petrochemical industry. From 1998 to 2000 the visible economic structure of the petrochemical industry experienced dramatic change. In just two years, it was transformed from an

industry composed of many small independent firms into a highly concentrated industry with most of its output produced by subsidiaries of the largest petrochemical companies. The restructuring transformed the onshore petrochemical industry from a function-oriented structure to a geography-oriented structure. An oligopolistic competition was established between two vertically-integrated national petrochemical corporations—CNPC and Sinopec. Nearly all state-owned oilfields, refineries and petrochemical plants subsequently have been incorporated into these two giants. CNPC transferred six oil & gas production plants in southern China to Sinopec. In exchange, it acquired 15 refineries and petrochemical plants in northern China which were originally owned by Sinopec. Local governments gave up the control of provincial and municipal petroleum distribution and companies: 15 went to CNPC and 19 to Sinopec (Wu 2002).

In 2001, the Chinese state began the gradual process of converging Chinese oil prices with the global market. Specifically, the government sets guidance (wholesale) prices based on global market prices and allowed retail prices to fluctuate within 8 percent on either side of these guidance prices, depending on prevailing international benchmarks.¹⁴ China already had been a net importer of oil since 1993, and thanks partly to the convergence of oil prices, the trade imbalance in the petrochemical products continued to grow.

China's growing need for petroleum and petrochemicals imports implies that downstream industries should strongly reject any AD measures, possibly waging a successful campaign against them in terms of national development goals. After all, they ultimately have to bear the expense. Likewise, if these imports reflect unmet domestic demand, then upstream firms ostensibly are not losing business from international competitors. What they get instead is a strong market signal to enhance efficiencies within their own domestic industry.

¹⁴ The international benchmark prices were based on the weighted monthly average of spot physical prices for these products in the benchmark Singapore, Rotterdam, and New York Harbor markets (Downs 2006).

There seems, in other words, little objective economic reason for there to be such a strong record of AD victories in the petrochemical sector, and yet that is exactly the pattern in China. Zeng (2007) attributes this to financial losses in the petrochemical sector, where a greater concentration of SOEs and greater demand for upfront investments can be found. While true, these factors alone cannot explain why related downstream industries failed to muster an adequate defense of their own material interests. After all, if enterprises in the steel sector's downstream can wage effective trade policy strategies on grounds of "public interest," China's national development goals, or a need to manage relations with its foreign investors, then the very same should be true of those downstream industries critically dependent on petrochemicals. They too include a broad composition of domestic and foreign economic actors, ranging from garment manufacturers and electronics producers to major local and foreign firms with operations in China's construction industry.

Different, it seems, is the degree of vertical integration which exists in each industry, and with it, demonstration of an SOE's ability to meet Beijing's national industrial development goals through greater market control. Domestically-manufactured petrochemicals, as earlier illustrated, are the source of a good deal more inputs to downstream industries than was ever the case for the China's steel sector and relations with its downstream industries. Given this, it seems that the cost-benefit calculation running in China is in terms of a firm's position within the hierarchy of enterprises operating in China, with vertically-integrated national key SOEs having the edge.

Situating the paucity of AD actions in the steel industry and their relative abundance in the chemicals sector from this angle does two things. It acknowledges the power of business "interest groups" (Kennedy 2005, Zeng 2004) to influence outcomes, while simultaneously getting away from equating these "interests" with a firm's position within a global supply chain. Instead a local

story gets told, and one in which the political economy of economic restructuring and its impact on “*tiao-kuai*” dynamics in China takes center stage.

From this angle, the global economy’s influence is reflected in the way Beijing implements its industrial development plans. To make this concrete, we offer below two AD cases to illustrate our perspective. Both suggest that the ability of SOEs to protect their material interests is at least partly constrained by some indication that they can shepherd successfully national industrial development plans.

Steel Safeguard Investigation

In 2002, the global steel crisis triggered a multi-country surge in steel safeguard investigations.¹⁵ China imposed temporary safeguards on imported steel products in response to U.S. government’s safeguards (China Trade Remedy Information 2002). In April 2003, five major steel producers and the Chinese Association of Iron and Steel Industry jointly filed a petition and requested the MOFCOM to impose tariffs on 84 steel products. Within a month, the MOFCOM decided to impose temporary safeguard measures of six months on 48 imported steel products, which were later extended to three years upon their expiration in November. The steel prices soared, resulting in a rapid increase in capital investments and output in the steel industry in 2003.

Companies in the downstream sectors suffered, however. Producers of household electronic products such as compressors and microwave ovens reported a 5-10 percent rise of costs due to the safeguard measure (Lu 2003). From January to March 2003, MOFCOM received over 200 petitions from downstream industries including shipbuilding, automobile, household electronics, and machinery pushing MOFCOM to abolish the steel safeguard tariffs (China Business News 2003). Within a month, the government removed most of the products from the

¹⁵ For a review of the steel safeguard measures in the U.S. and globally, see Reed 2005.

list (Lu 2003). In November 2003, the MOFCOM terminated all safeguard measures on steel products, two years prior to their scheduled termination date.

This timing, it should be noted, came shortly after the US and EU ended protective tariffs imposed on China (AFP 2003). A similar outcome resulted in the case of stainless steel (Kennedy 2005), minus the tit-for-tat edge, suggesting that without further integration of the steel industry, government officials seem more than willing to accommodate downstream interests.

Polyvinyl chloride (PVC) Antidumping Case

In March 2002, five chemical companies petitioned to the MOFCOM and requested an AD investigation on the import of PVC. In September 2003, the Chinese government imposed AD duties on the import of PVC originally produced in the U.S., Japan, Russia, Korea, and Taiwan. The imposition of AD measures immediately resulted in a 60 percent rise of PVC price, followed by a 30 percent growth of domestic PVC production, and a sharp decline in imports. The five applicants, all of which are key SOEs in their own provinces, benefited significantly from the AD measure. Even before the MOFCOM made the final decision on the AD measure, four listed companies on the stock market reported their profits more than doubled in the first half of 2003 (China Chemical Industry News 2003).

However, the downstream users of PVC, primarily small and medium-sized private companies, were hit hard by the AD measure. Two of the three largest PVC consumers, including two private companies and one medium-sized SOE, have seen their sales and profits plunge. Nearly half of the other companies have turned from profitable to loss making (Shen et al. 2005). Despite the hardship by the downstream PVC users during the five years of imposition of AD tariffs on imported PVC, eight Chinese PVC producers, all of which are large SOEs, requested an extension of the AD measure. The MOFCOM launched an AD sunset review in September 2008.

One year later, MOFCOM extended the AD duties for another five years, claiming that the domestic PVC industry would otherwise be injured. The underlying cause was a dramatic drop in oil prices which undercut the price competitiveness of China's coal-based calcium carbide PVC and encouraged downstream industries to import ethylene-based PVC at far lower cost.

Comparatively, the lesson here is not that Beijing is disinterested in the making of a highly integrated value-added steel industry, but rather until able to do so, foregoes protectionism for its own sake to meet broader development goals. The patterning of AD cases in China, as such, is irreducible to the matter of unmet demand, or need for specific imports. After all, China has long had shortfalls in most petrochemicals critical to manufacturing and infrastructure improvements.

Lack of AD actions even by lead SOEs in the steel industry instead reflects the current status of downstream industries in broader development plans. That is, with the shift away from import substitution, the Chinese government has married its goal of creating national champions with a willingness to gain advantage through global partnerships and foreign direct investment in core sectors, including automobiles and aircraft. This marriage is the real disadvantage for the steel industry, still fragmented and without a heavy concentration of key national corporations to counter-balance the very same that dominate in the downstream. Moreover, with steel-consuming industries such as automotive, construction, and electronics identified as pillar industries in the Eighth and Ninth FYP (1991-2000), they are guaranteed to receive wide-ranging government support.

The current global economic crisis may, of course, change things. The sharp decline in steel prices and export opportunities is producing a situation for Chinese steel somewhat identical to what hit the oil industry in the late 1990s. The Baosteel Group, for example, experienced a 32 percent drop in net profits in 2008 (Reuter 2009). In March 2009, the State Council unveiled a plan for "reinvigorating the steel industry," calling for restricting capacity in the steel sector as a top

reform priority and intensifying a campaign for industry consolidation (Xinhua 2009). With this, we are also seeing a rise in mergers and acquisitions.

The petrochemical industry, in contrast, has managed to capture the spillover effects of a decade's worth of effort to ensure a growing home market for its products. The downstream industries, comprised of specialty companies that rely on these ingredients for use in consumable products directed toward distinct markets, have been affiliated with or become more dependent on the upstream conglomerates. Foreign direct investment in the petrochemicals industry, in turn, has increased, laying the groundwork for China to have what gave the U.S., Taiwan, Japan, and Korea a considerable competitive edge from the 1960s. To the extent that China succeeds in this endeavor, it will have moved a bit closer to its goal of improved national and economic security. Until then, its manufacturing base depends heavily on imports for critical intermediate petrochemical products, leaving China still something of an economic giant on clay feet.

Conclusion

In this paper, we set out to explain patterns of AD petitions in China over the past decade. We focused on the political economy of economic restructuring in China and its effect on the distribution of power within domestic production chains. We argue that the interaction effect of exogenous economic shocks and national industrial policy intentions go some way toward explaining why the petrochemical sector has come to dominate AD cases in China. Specifically, we found that when national economic restructuring plans are thwarted, the consequences extend to how the central government is likely to respond to demands for protection, even from SOEs. Looking at the political economy of economic restructuring from this angle allows us as well to make clear that national industrial policy does not end with implementation of trade liberalization policies. To the contrary, it may very well benefit from them, and in surprising ways.

Given this, the common dichotomies that define international political economy explanations of firm policy preferences, ones that emphasize either domestic or international factors, material or non-material conditions, seem insufficient to explain government-business relations in China today. Focusing instead on the interaction effects between these realms, we are able to paint a picture of economic transformation in China that centers around tensions between the central government's intention of strengthening pillar industries and comparable weaknesses which result from local government and industry interests to forestall the very same.

Traditional developmental state literature tends to focus on how national governments affect the development of firms. Our paper suggests that even for a country, such as China, with a strong feature of state intervention, domestic firms can determine industrial policy outcomes. We show that due to on-going, conflicting interests between the central and local governments, dependence on SOEs as a growth strategy may ultimately constrain Beijing's ability to meet national development goals, a seemingly counterintuitive finding.¹⁶

The last observation is particularly useful in the China context. Changing the identity of state-owned enterprises through shifting factory manager incentives, privatization, mergers and acquisitions, and critical changes in the state bureaucracy has been at the heart of the Chinese government's industrial policies of the past three decades. Our recognition that economic interests are, as a result, not structural in origin allows that political context will have a role to play in shaping firm strategy in the years ahead.

¹⁶ Note that our explanation of the distinct outcomes of industrial consolidation is different from Huang (2002), who argues that China's divided and decentralized bureaucratic arrangement played a key role in the failed consolidation attempt in the automotive industry.

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Table 1: Antidumping Cases in Petrochemical and Steel Industries (1998-2009)

	Petrochemicals		Steel	
	China as plaintiff 1998-2009	China as defendant 1995-2009	China as plaintiff 1998-2009	China as defendant 1995-2009
Cases	119	153	9	153
Percentage	66%	22%	5%	22%
Petitioners	42 (61%)		6(100%)	
SOEs	37 (54%)		6 (100%)	
National Key SOEs	37 (65%)		6 (100%)	
Subsidiaries of top Four companies	24 (Sinopec 10; CNPC 9; Sinochem 5)		3 (Wusteel, Baosteel, Ansteel)	

Source: estimate based on Global Antidumping Database (Bown 2010).

Table 2: Trade Dependency in Steel and Petrochemical Industries (2000-08)

Year	Export/ Import	Steel	Petrochemicals	
			Petroleum	Chemical
2008	Export	16%	21%	
	Import	5%	24%	
2007	Export	17%	23%	
	Import	7%	31%	
2006	Export	8%	9%	15%
	Import	6%	47%	22%
2005	Export	6%	12%	16%
	Import	10%	44%	25%
2004	Export	6%	13%	16%
	Import	12%	45%	27%
2003	Export	3%	15%	17%
	Import	18%	39%	28%
2002	Export	3%	15%	17%
	Import	17%	33%	28%
2001	Export	3%	15%	17%
	Import	16%	32%	25%
2000	Export	6%	15%	17%
	Import	17%	39%	26%

Note: Export dependency is calculated as export divided by total output; import dependency is calculated as import divided by total output.

Source: Industrial output data from China Yearly Industrial Data 2000-2008; Import/export data before 2007 from China Trade and External Economic Statistical Yearbook 2002-2007. Export/import information of 2007 and 2008 from the Customs Service's Statistics. The categorizations do not allow for the distinction between petroleum and chemical products.

Table 3: Geographical Distribution of Steel and Petrochemical Industries 2007

	Petroleum Processing, Coking and Nuclear Fuel Processing		Raw Chemical Material & Chemical Products		Smelting & Pressing of Ferrous Metals	
No.	Province	Market Share (%)	Province	Market Share (%)	Province	Market Share (%)
1	Shandong	13.28	Jiangsu	19.55	Henan	11.17
2	Liaoning	12.28	Shandong	17.22	Jiangsu	10.51
3	Guangdong	8.47	Guangdong	9.09	Shandong	9.68
4	Shanxi	6.43	Zhejiang	7.74	Guangdong	8.56
5	Shanghai	5.39	Shanghai	5.61	Jiangxi	8.44
6	Hebei	5.13	Henan	4.22	Zhejiang	6.76
7	Zhejiang	4.92	Liaoning	3.39	Hunan	5.21
8	Jiangsu	4.63	Hebei	3.25	Yunnan	3.93
9	Heilongjiang	4.35	Sichuan	3.06	Inner Mongolia	3.83
10	Shaanxi	4.09	Hubei	2.88	Liaoning	3.58
Top 5		46.15		59.23		48.36
Top 10		69.27		76.03		71.67

Source: China Yearly Industry Data 2008, access through China Data Online

Table 4: Industry Structures of Steel and Petrochemical Industries (1999-2008)

Year	Petrochemicals					Iron & Steel				
	No of Firms	No of SOEs	Revenue (billion RMB)	Share of SOE Revenue	CR4 Ratio	No of Firms	No of SOEs	Revenue (billion RMB)	Share of SOE Revenue	CR4 Ratio (steel output)
1999	12,325	3,859	763	66%	n.a.	3,042	686	409.7	74%	31%
2000	12,423	3,215	1,017.80	68%	n.a.	2,997	577	473.3	74%	32%
2001	13,058	2,588	1,089.20	65%	78%	3,176	490	570.7	72%	29%
2002	13,781	2,142	1,200.50	60%	79%	3,333	409	649.2	67%	25%
2003	15,126	1,661	1,548.00	58%	74%	4,119	698	1,000.70	59%	21%
2004	20,778	1,577	2,187.90	54%	66%	7,141	345	1,694.90	53%	19%
2005	20,706	1,108	2,836.00	51%	63%	6,649	225	2,147.10	47%	18%
2006	22,875	909	3,559.80	49%	57%	6,999	199	2,540.40	43%	21%
2007	25,130	689	4,465.00	46%	59%	7,161	162	3,370.30	42%	20%
2008	30,640	658	5,594.50	44%	58%	8,012	149	4,565.87	44%	22%

Source: China Yearly Industrial Data 1999-2008. The petrochemical industry includes petroleum processing and raw chemical materials & chemical products.

For the steel industry, the CR4 ratios (shares of top four companies in total output) for 1999-2004 are from Sun 2007, CR4 ratio for 2005-08 from China Steel Report, Metallurgical Industry Information Center. The list of the top four steelmakers varies over time, largely because that some large state-led mergers in recent years have significantly changed the market structure. In 2008, the top four firms (in terms of steel output) are Baosteel (Shanghai), Hebei, Anben (Liaoning), and Wusteel (Hubei).

For the petrochemical industry, Top four companies are Sinopec, CNPC, Sinochem, and CNOOC. The sources of revenues of the four companies include petroleum and natural gas extraction and other sectors, which makes their share in the petrochemical sector larger than the share of total SOEs. Company Revenue information is from <http://www.ccc-ceda.org.cn/c500/chinese/>.

Table 5: Domestic Input-Output ratios (1995-2002)

Upstream industries	Downstream Industries	2002	2000	1997	1995
Refined petroleum products	Chemicals	0.052	0.046	0.024	0.021
	Manufacture of gas; distribution of gaseous	0.097	n.a.	n.a.	0.059
Chemicals	Textiles, textile products, leather and footwear	0.065	0.071	0.055	0.058
	Wood and products of wood and cork	0.067	0.040	0.050	0.056
	Pulp, paper, paper products, printing and publishing	0.055	0.045	0.045	0.051
	Pharmaceuticals	0.049	0.062	0.067	n.a.
	Rubber & plastics products	0.187	0.208	0.210	0.226
Iron & Steel	Fabricated metal products	0.232	0.252	0.209	0.304
	Machinery & equipment	0.135	0.160	0.102	0.159
	Electrical machinery & apparatus	0.041	0.040	0.021	0.107
	Medical, precision & optical instruments	0.056	0.066	0.046	0.076
	Motor vehicles, trailers & semi-trailers	0.079	0.066	0.070	0.083
	Building & repairing of ships & boats	0.135	0.129	0.108	0.090
	Railroad equipment & transport equipment	0.073	0.082	0.074	n.a.
	Construction	0.091	0.076	0.051	0.071

Note: Input-output ratio is the proportion of domestic intermediate products of the upstream industries in producing outputs of the downstream industries. The higher the ratio, the more integrated the two industries.

National Bureau of Statistics (NBS) compiles benchmark tables every 5 years and annual tables in the midpoint between benchmark years. The 1997 and 2002 tables are benchmark tables; 1995 and 2000 tables and annual tables.

Source: Calculated based on Input-Output Tables of China (1995, 1997, 2000, 2002), retrieved from OECD Input-Output Tables (2006

Edition). http://www.oecd.org/document/32/0,3343,en_2649_34445_42162912_1_1_1_1,00.html

Table 6: Industrial Breakdown of National Key SOEs (2009)

Total	394
Steel Industry	33
Petrochemical Industry	46
Steel Downstream Industries	103
Petrochemical Downstream Industries	43

Source: http://www.sasac.gov.cn/wzlj/wzlj_zdqy.htm

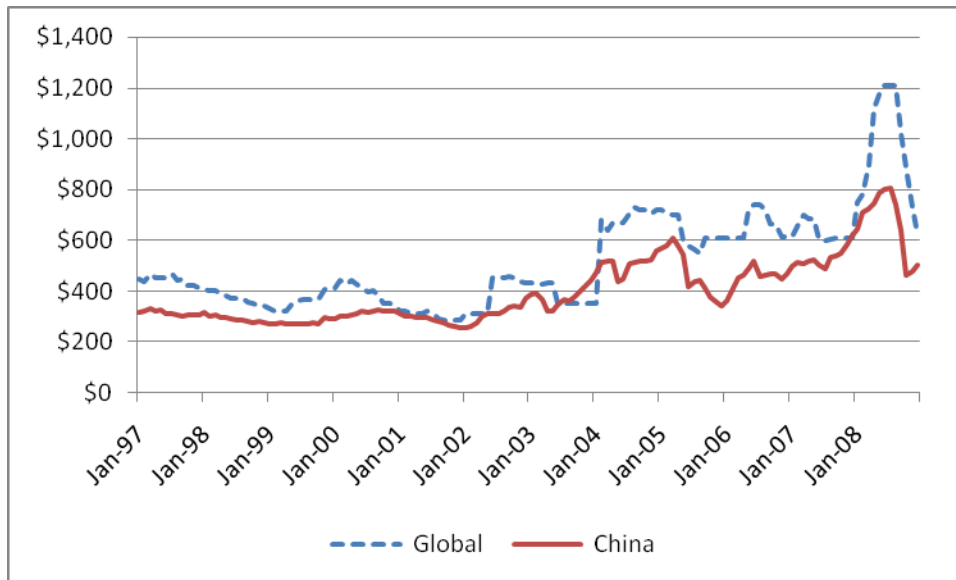
Note: Steel downstream sectors include automobile, construction, electronics, machinery, and heavy equipment companies.

Chemical downstream sectors include textile, pharmaceutical, plastics, and rubber companies.

Table 7: Summary of Mergers in the Steel Industry (2005-2009)

Finished merger	Failed merger
Intra-provincial (mergers) <ul style="list-style-type: none"> • Anshan and Benxi (Liaoning) • Tangshan and Handan (Hebei); • Jinan and Laiwu (Shandong); 	Intra-provincial
Inter-provincial (acquisitions) <ul style="list-style-type: none"> • 2006: Baosteel (Shanghai) with Bayi Steel (Xinjiang) • 2008: Baosteel with Shaoguan and Guangzhou (Guangdong); • Wuhan with Liuzhou (Guangxi) and Kumin (Yunnan) 	Inter-provincial (mergers) <ul style="list-style-type: none"> • Baosteel with Handan (Hebei), Ma'anshan (Anhui), Baotao (Inner Mongolia) • Capital Steel (Beijing) with Tangshan (Hebei)

Figure 1: Domestic and Global Steel Prices (Hot-Rolled Coils) 1997-2008



Source: Global prices data from http://www.econstats.com/rt_steel.htm

Chinese prices data from <http://www.mysteel.net/myopic.html>.

Note: Chinese prices data were originally measured as index with July 2000 as the benchmark point 100. We use July 2004 average prices for hot-rolled coils in the Chinese market (RMB 4189 per ton) as a benchmark to transform the index into actual prices. Exchange rates data from <http://www.chinability.com/Rmb.htm>.