Assessment of the Probable Economic Effects on NAFTA of Granting Market Economy Status to China

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Executive Summary

China is a reforming economy, not a market economy. Three independent economic studies, conducted by an economist from each NAFTA country, conclude that treating China as a market economy in antidumping investigations would severely damage NAFTA steel industries and harm NAFTA economies. The main conclusions of the three reports are:

- NAFTA countries currently use antidumping laws to cope with dumped imports from China. The duty that offsets China's dumped prices is based on calculations that properly treat China like a non-market economy.
- According to the Mexican Report, the price of Chinese steel does not reflect its true resource cost. These prices would be much higher if China's steel industry operated according to market economy principles.
- China's competitiveness in steel is artificial, a creation of steel-oriented industrial policies that led to outsized increases in capacity, production, and exports since 2002.
- China now accounts for nearly half of global steel output, and its share is likely to continue growing if China is treated as a market economy in antidumping calculations.
- If China is treated like a market economy, the harm to NAFTA steel industries and economies would be significant. Dumping margins would be zero or close to zero, making antidumping laws much less effective for remedying injury from dumping.
- According to the U.S. report, U.S. steel output would decline by approximately US$21.1 billion and U.S. economic welfare would decline by US$40.2 to US$46.5 billion.
- NAFTA steel industry output would shrink by US$31.5 billion and NAFTA economic welfare would decrease by US$42.5 to US$68.5 billion.
- Demand for labor in the United States and NAFTA declines. In the United States, labor demand shrinks by US$29.6 billion, equivalent to 400,000 to 600,000 workers.
- According to the Canadian Report, there is a permanent, long-run reduction in Canadian GDP of up to C$8 billion, across a broad-range of Canadian sectors (50 percent of impact on manufacturing) and Provinces.
- Labor income in Canada decreases by C$8 billion, resulting in a loss of up to 60,000 highly-skilled jobs (including 25,000 in manufacturing, the majority of which never return).
- Canadian non-residential investment spending is reduced by up to C$2 billion per year.
- Government revenues in Canada are reduced by C$1.2 billion at Federal level and C$1.1 billion at Provincial levels.

Background

Among the major economic developments over the past 40 years, the emergence of China's economy has been among the most far reaching. China has become one of the world's largest manufacturers and exporters, in large measure due to government efforts to promote industrialization through the foundation and expansion of export-oriented industries. These policies have had a profound effect on NAFTA economies, and on the world economy as a whole.

Given the scale of Chinese exports, how other countries apply their antidumping laws to Chinese imports can have major ramifications. The international trading system has long recognized dumping – essentially, the sale of a good in a foreign country at a price lower than in the country of manufacture or below the producer's cost of production – as a harmful form of price discrimination that provides an unfair advantage in international competition. International rules allow the importing country to offset this unfair advantage (if injurious to the domestic industry) by imposing an antidumping duty on the unfair imports equal to the difference between the price in the importing country and the price in the exporter's home market.

This methodology is only meaningful if the prices in both countries are set by market forces. Even before China sought to join the WTO, the members of the international trading system had agreed that it was appropriate to apply different rules in antidumping investigations involving countries, such as those in Eastern Europe, where market forces did not determine prices or allocate resources.

When negotiations began for China's accession to the WTO, China's trading partners agreed that the central role of the government in China's economy raised the same problems. Thus, China's Protocol of Accession to the WTO provided that WTO members could apply methodologies in antidumping investigations of Chinese products that based dumping calculations on something other than Chinese prices or costs. This is often described as giving China "non-market economy country treatment" ("NME" treatment). These rules have been applied worldwide, including by the three member countries of NAFTA: Canada, Mexico, and the United States.

China's Protocol of Accession sets forth the precise rules regarding the treatment of Chinese products in antidumping matters. Due to certain language in the Protocol, some have argued that other WTO members must treat China as a market economy in antidumping cases starting in December 2016, and use Chinese prices and costs for dumping calculations. This interpretation is subject to vigorous dispute, and there are strong arguments that WTO members may continue to treat China as a non-market economy after 2016.

The purpose of these studies is not to opine on the legal debate, but rather to assess the economic effects on NAFTA countries of conveying NME treatment to China in December 2016. What will happen to the NAFTA steel industries and economies if NAFTA countries begin to treat China as a market economy instead? This work contains three studies that examine this question

from different perspectives, using different methodologies and frames of reference. The reports conclude that prices for steel, and for the inputs used to produced steel, are still not determined by market forces in China; that using those prices and costs in antidumping calculations will result in lower or no dumping margins on imports of Chinese steel; and that NAFTA steel producers, and NAFTA economies overall, will suffer severe injury as a result.

China is a reforming economy, not a market economy, and now accounts for nearly half of global steel output. China's share is likely to continue growing if it is treated as a market economy for purposes of antidumping laws. Allowing China the benefit of this treatment, without requiring a completion of economic reforms, would remove a powerful incentive for completion of the reform program.

The reports were prepared by Manuel Molano Ruiz of the Instituto Mexicano para la Competitividad A.C. (IMCO); Andrew Szamosszegi of Capital Trade, Inc. (CapTrade); and Robin Somerville of the Centre for Spatial Economics (C_4SE).

I. Introduction

Among the major economic trends over the past 40 years, the emergence of China's economy has been among the most far reaching. Both inside and outside of China, the country's rapid economic expansion has been beneficial and harmful. Within China, this economic expansion lifted 200 million into the ranks of the world's middle class. But at the same time, this expansion also created environmental pressures in China that produced choking haze in cities, the degradation of soil and rivers in the countryside, and very little of the political convergence that many in the West anticipated.

This duality was present outside of China as well. China's expanding buying power created great customers for foreign firms in certain industries and lower prices for labor-intensive consumer goods that China came to dominate. But China's economic rise has also had an undeniable dark side for many workers and firms in other countries, including NAFTA countries. The addition of hundreds of millions of Chinese workers to the global labor pool has, consistent with economic theory, put pressure on workers in import-competing industries in more developed countries, as well as in other developing countries.

China's emergence as one of the world's largest manufacturers and exporters was also driven by Chinese government policies, and the Chinese government continues to play an important role in the management of China's economy. A major goal of the Chinese government has been to promote the industrialization of China through the foundation and expansion of industries that can export a substantial amount of their total production. These policies have had a profound effect on the economies of NAFTA countries, and on the world economy as a whole.

When China joined the World Trade Organization in December 2001, China's trading partners recognized that the central role the Chinese government played in China's economy could create severe distortions in international trade – distortions that could injure industries and workers in other WTO countries. This was not a novel situation. The international trading system had previously encountered the issue of how to respond to unfair trade practices by countries that did not rely on market forces to determine prices and resource allocation—typically eastern European countries. These rules were developed because government-set or influenced prices in countries that lacked market economies (so-called non-market economies or "NME") could not be used to calculate dumping margins using traditional "price-to-price" methodologies. Antidumping laws, which have existed since the early 1900s and have been widely adopted, allow countries to offset the unfair commercial advantage that dumping provides. In recognition of the fact that China was not a market economy, trade negotiators ensured that China's WTO-accession agreement contained certain safety valves that would enable government agencies to

deal with import surges and unfair trade from China. Among these is the ability of countries to apply the special NME rules when calculating "dumping margins" to offset any advantage conferred by unfair pricing.

These rules have been applied worldwide, including by the three member countries of NAFTA: Canada, Mexico, and the United States. Because of certain language in China's WTO accession agreement, some have argued that China will graduate to market economy status for purposes of antidumping calculations in December 2016. However, this interpretation of the agreement is disputed.

The purpose of the attached studies is not to offer an opinion in the legal debate, but rather to assess the economic effects on NAFTA countries of conveying NME treatment to China in December 2016. Although it is undeniable that China has reduced its reliance on central planning, even China's leaders explicitly acknowledge that China is not a true market economy, but rather one where state ownership and direction continue to play a pronounced role. Events during the summer of 2015, in particular the government's sudden currency devaluation and heavy handed efforts to stem a rapid decline in share prices, underscore this point, as do other intensive analyses of China's economic policymaking. China is a reforming economy, not a market economy.

The status of China's economy for purposes of antidumping is important to both manufacturing and agricultural industries that face unfair import competition from China. The NAFTA steel industries are especially prone to injury from unfair Chinese imports for several reasons. First, the steel industry has been a focus of China's industrial plans since at least the mid-1990s. Second, many of China's largest steel producers are state-owned, with ownership disbursed among central, provincial, and municipal governments composed of Communist Party members, and are frequently major sources of employment and tax revenues. Third, and as a consequence of the previous two factors, China's steel producers have received a variety of subsidies from different levels of government, including various forms of debt forgiveness and capital infusions that prevented uneconomic capacity from closing. As a result, since 2002, the Chinese steel industry has experienced a huge increase in capacity and Chinese steel prices have declined well below levels in Europe and the United States. As a consequence, NAFTA steel industries are especially vulnerable to imports from China, and rely on antidumping and antisubsidy laws to cope with surges of artificially low-priced steel from China.

Because steel prices in China are artificially depressed, using those prices in antidumping calculations would likely result in zero margins or near zero when based on market economy calculation methodologies. With zero margins, all existing antidumping orders on steel imports would disappear, and no injured steel producers would be able to obtain relief from dumped Chinese steel.

What will happen to the steel industries and economies of NAFTA countries if a non-market economy the size of China is treated like a market economy? This report presents three studies that examine this question from different perspectives, using different methodologies and frames of reference.

The first perspective, from Manuel Molano Ruiz of the Instituto Mexicano para la Competitividad A.C. (IMCO), takes the broadest view. He finds that China's policies have significantly distorted steel prices in China and driven China to be the world's largest steel producer. These distortions are so extensive that if current Chinese policies continue and China is treated as a market economy, China will in the long run be the only country that produces steel. If WTO members treat China as a market economy when it is not, the ultimate result will be the destruction of the steel industries in NAFTA countries and the rest of the world. Using the GTAP database and the GTAP model in GAMS, he demonstrates that China's price competitiveness in steel is artificial. The report also shows that China would benefit more from reducing its reliance on subsidies than if NAFTA and other countries granted it ME status.

Andrew Szamosszegi of Capital Trade, Inc. (CapTrade) focuses on the economic effects of market economy treatment for China on NAFTA as a whole, as well as on the United States in particular. Because domestic steel prices in China are artificially low due to China's steel policy interventions, treating China as a market economy will generally result in dumping margins of zero or near zero. Using the standard GTAP model, the report demonstrates that, as a consequence, the U.S. and NAFTA steel industries will suffer significant reductions in output. By taking unemployment and investment effects into account, the simulations in the report indicate that the economic harm will extend far beyond the steel industry. The report also addresses what would happen to the United States if NAFTA countries fail to follow a unified approach regarding market economy treatment for China.

The study by Robin Somerville of the Centre for Spatial Economics (C4SE) examines the impact of granting market economy treatment to China on Canada as well as on the individual provinces. His estimates are based on the C_4SE's Provincial Economic Modelling System, a multi-region, multi-sector, dynamic stochastic general equilibrium model (DSGE) where the regions represented are Canadian provinces. An advantage of this model is that it produces economic impacts at an annual frequency over the medium to long-term. Somerville examines the economic effects on Canada if all NAFTA countries treat China as a market economy and if Canada alone graduates China. He concludes that the damage to NAFTA steel industries from prematurely conveying market economy status will have lasting, adverse consequences to Canadian GDP, non-residential investment, productivity, and living standards, as well as adverse effects on Canadian employment levels in the short-to-medium term. On a provincial level, the largest effects occur in Quebec, Manitoba, Saskatchewan, Ontario, British Columbia, and Alberta.

Thus the authors, three independent economists, concur that granting market economy status to China at this time and under these circumstances would damage NAFTA economies, including significant damage to NAFTA steel industries.

Chapter II and Chapter III contain a more detailed discussion of the NME provision and Chinese industrial policies in the steel industry, respectively. These are followed by the country reports for Mexico (Chapter IV), the United States (Chapter V), and Canada (Chapter VI).

II. The NME Provision and China

Antidumping laws are widely used by governments in developed and developing countries to combat international price discrimination. Technically, dumping occurs when an exporter sells a product in a foreign market at a price lower than it sells that product at home, or at a price that is less than the cost of production.

When the producers of a country are found to injure a domestic industry by dumping, the appropriate remedy is an antidumping duty that offsets the difference between the price charged in the home market (or third country market if there are not sales of the product in the home market) and the unfair price charged in the importing country. If such prices are not available, the price difference, known as the *margin*, is calculated from the dumping companies' production costs.

Non-market economies ("NMEs"), especially larger ones like China and the former Soviet Union, pose special problems for market economies.[1] The problem is that in countries in which the government determines or controls prices, the antidumping methodologies used to estimate the dumping margin may fail to offset the commercial advantage conferred by dumping. In recognition of these difficulties, the GATT in 1955 modified its regulations for antidumping laws by adding a note that in certain cases, the use of prices in the country charged with dumping may not be appropriate.[2] In subsequent negotiations over Poland's accession to the GATT, the accession working party suggested that the home market price in an NME country could be constructed on the basis of third country prices.[3] This sentiment was incorporated into GATT by the Tokyo Round in 1979 and subsequently into U.S. law.[4] This NME methodology is used by all three NAFTA countries to estimate the dumping margins to apply against dumped imports from China and other non-market economies.

Because the prices in the non-market country are not reliable at home or in third countries, the margin must be calculated using the cost of production. But since the costs of inputs used in production are also unreliable, the NME methodology requires that such costs be estimated by combining "usage rates" of the producer (i.e., how much steel is used to make a nail) with the cost of that steel in a comparable, market economy country.

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[1] John Jackson. *The World Trading System*. Cambridge: MIT Press (1989) at 85-6.
[2] Stewart A. Baker and Richard O. Cunningham, Countertrade and Trade Law , 5 J. Int'l L. 375 (10). Available at: http://scholarship.law.upenn.edu/jil/vol5/iss4/11.
[3] *Id.* at 385.
[4] *Id.* at 385-6.

The methodology of combining NME "usage rates" for factors of production (e.g., labor hours, electricity, raw materials, and other production inputs) with market economy factor values was first employed in the antidumping investigation of electric golf carts from Poland in 1975.[5] In that investigation the "normal value" (or non-dumped price) used for dumping calculations was based on a combination of Polish usage rates and Spanish factor values.[6]

The People's Republic of China joined the WTO as its 143rd member on December 11, 2001.[7] At that time, China was widely considered a non-market economy because, despite economic reforms, it remained a centrally planned economy. As discussed in Chapter III, the U.S. Department of Commerce had been applying this provision in antidumping investigations involving China since the early 1980s.

Because of the prominence of directed or otherwise controlled aspects of China's economy, negotiations to readmit China to the WTO took 15 years.[8] China's protocol of accession spells out China's commitments to reform its trade regime and economy. The protocol also provides transitional periods giving China time to bring its laws and policies into compliance with WTO measures and giving other WTO members time to apply special safeguards to cope with market distortions arising from rapid increases in imports from China. The protocol also allows WTO members to use "a methodology that is not based on a strict comparison with domestic prices or costs in China" when calculating antidumping margins for Chinese exporters; that is, the protocol to which China agreed specifically allows WTO members to use the NME methodology currently used by NAFTA countries.

On December 11, 2016, certain provisions of the protocol are set to expire. Some argue that the expiration of one provision, subparagraph 15(a)(ii), entitles China to receive market economy treatment with respect to antidumping after December 2016.[9] However, a plain reading of the protocol suggests that the expiration of this subparagraph will not nullify section 15 in its entirety and that Member countries, including the NAFTA countries, can continue to apply the NME methodology (or similar ones) until China (or Chinese producers) can demonstrate that it operates under market economy conditions.

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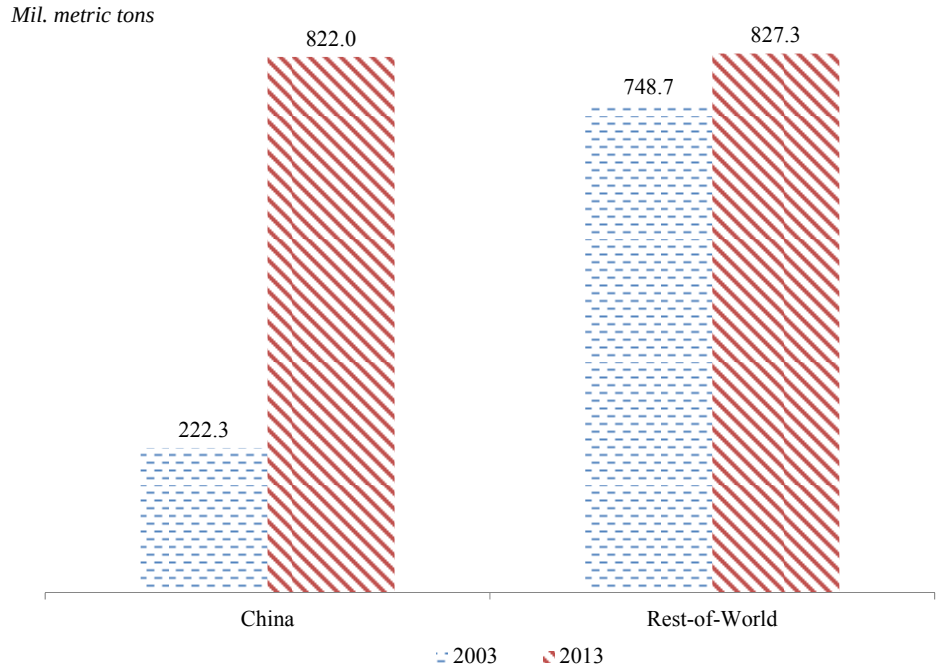
[5] Jackson at 295; and Greg Mastel. *Antidumping Laws and the U.S. Economy*. Armonk: M.E. Sharpe (1998) at 54;
[6] Mastel at 54. The 1988 trade bill added the requirement that the surrogate country from which factor values were drawn must produce the product that is subject to the investigation.
[7] Peter Wonacott. "China Formally Enters the WTO on Tuesday." *The Wall Street Journal*. (December 11, 2001).
[8] Ironically, China was one of the original contracting parties to the General Agreement on Tariffs and Trade in 1948. Jeffrey L. Gertler. *What China's WTO Accession is All About*. Geneva: WTO Secretariat (2001) at 1.
[9] K. William Watson. *Will Nonmarket Economy Methodology Go Quietly into the Night?* Cato Institute Policy Analysis no. 763 (October 28, 2014).

How this legal and policy debate plays out will have important ramifications on NAFTA economies. NAFTA steel industries are particularly vulnerable to Chinese market distortions because the Chinese government's economic policies created an environment characterized by excess capacity and excessively low prices.

III. China's Interference with Market Mechanisms—The Case of Steel

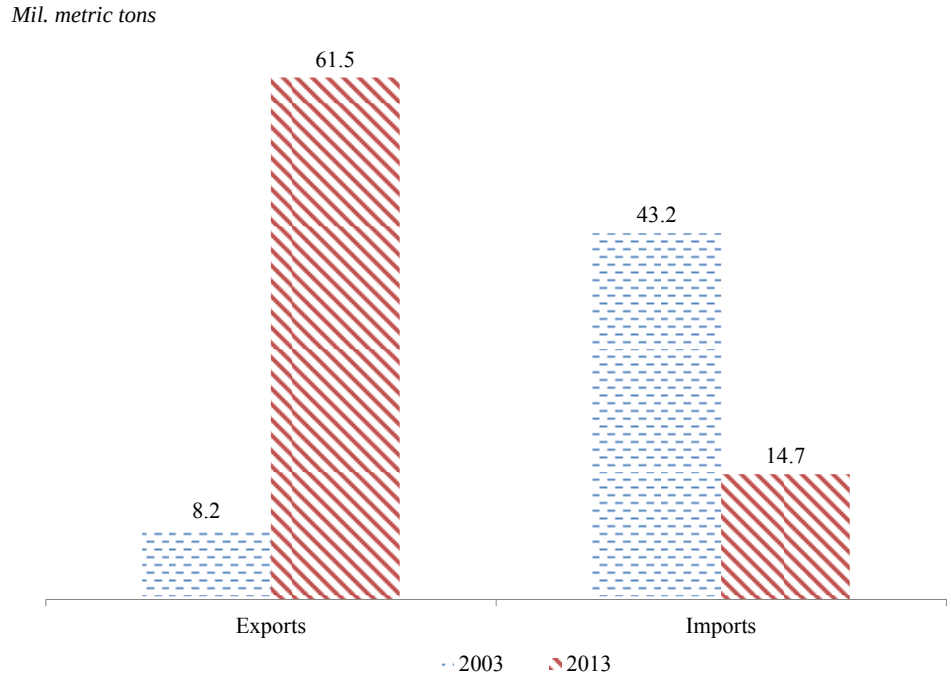
China has become the world's largest producer of steel, despite the fact that it has no natural comparative advantage in steel production. In 2003, China accounted for 22.9 percent of global steel production. By 2013, China accounted for nearly half of world output, as shown in Figure III-1. During that period, Chinese steel exports increased from 8.2 million metric tons to 61.5 million metric tons, and its imports were slashed by two-thirds, transforming the country from a net importer of steel to a net exporter (Figure III-2).

Figure III-1. Production of Crude Steel in China and the Rest of the World



Source: Steel Statistical Yearbook, 2014 and 2013.

Figure III-2. China's Trade of Finished and Semi-finished Steel Products



Source: Steel Statistical Yearbook, 2014 and 2013.

This impressive performance did not arise because China has natural a comparative advantage in the production of steel. Modern steelmaking is an energy and capital intensive process that requires large quantities of iron ore, steel scrap, and coal. Yet China is a labor rich country that must purchase key inputs, such as iron ore and coal, from distant international markets and, in theory, should be disadvantaged in trade due to the costs of serving faraway markets. The extent to which China's steel industry is government-owned and supported through subsidies also suggests that the country's ability to run trade surpluses in steel mill products has been policy-driven, rather than the result of any natural comparative advantage.

A. China's reliance on top-down industrial plans

Despite more than three decades of reform, China continues to curtail market forces in various ways. The government of China ("GOC") guides the development of China's economy through five-year plans that identify favored sectors that will be favored by government policies. The GOC issues more detailed sectoral plans that identify technologies for domestic companies to develop or acquire.[10] The GOC acts as the gatekeeper for foreign investments, favoring

[10] United States International Trade Commission. *China: Description of Selected Government Practices and Policies Affecting Decision-Making in the Economy*. Inv. No. 332-492 (Pub. 3978) (December 2007).

investment in certain sectors while discouraging others[11] and controls the prices of and access to key inputs, including land, electricity, and bank finance. These policies influence the supply and demand, and therefore the price, of steel in China.

China's economic and social development is guided by five year plans that are developed by the CCP and approved by China's legislature, the National People's Congress. Industrial planning in key sectors or regions is also incorporated into the plans, including which industries and products should be targeted for preferential government support. The plans enumerate the types of preferences to be provided such industries. The five year plans aim to "arrange national key construction projects, manage the distribution of productive forces and individual sector's contributions to the national economy, map the direction of future development, and set targets."[12] They are commonly referred to as a national "blueprint" for industrial development. The plans serve as economic and industrial instructions for planning agencies, local and provincial governments, banks, and state-owned enterprises.

The five year plans are implemented through a series of industrial catalogues. The catalogues are planning documents that list key industries and products that are favored by the central government, pursuant to the broad statements included in the Five Year Plans. For example, in 2005 the National Development and Reform Commission ("NDRC"), China's premier planning agency, issued the "Directory Catalogue on Readjustment of Industrial Structure," which contained plans for 26 industries, including steel. This catalogue contains both general platitudes as well as specific instructions; under the steel subheading, the catalogue lists as an encouraged project the "{c}onstruction of new generation large-volume mechanic coke oven of coke dry quenching, coal charging and coke pushing and cleaning apparatus with the height and width of the carbonization chamber no less than 6 meter and 500 mm respectively."[13] The fourteenth encouraged project for the steel industry is, "Steel tube production for oil well pipe in oil extraction, high-pressure boiler tubes in plant, long-distance transmission of oil and gas."[14]

The metals industries, especially the steel industry, are featured prominently in GOC planning documents. The 10th Five Year Plan (2001-2005) called for "energetically optimizing and improving [the] industrial sector" by enhancing traditional industries, particularly metallurgy and energy, with new technologies and intensifying construction of transportation, energy and other

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[11] Decree of the State Development and Reform Commission, Ministry of Commerce. *No. 57, The Catalogue for the Guidance of Foreign Investment Industries (Amended 2007)* (October 31, 2007).
[12] What is the Five-Year Plan. May 21, 2007. http://www.china.org.cn/english/MATERIAL/157595.htm (accessed August 18, 2011).
[13] National Development and Reform Commission, *Directory Catalogue on Readjustment of Industrial Structure (Version 2005)* (12/06/2007).
[14] *Id.*

infrastructure facilities.[15] With regards to industry, the 11th Five Year Plan (2006-2010) focused on consolidation of capacity, in part due to excess capacity in industries such as steel that arose in response to the 10th Five Year Plan.[16] The 12th Five Year Plan (2011-2015), which focuses on "rebalancing" the economy, contains specific instructions on restructuring the domestic steel industry.[17]

China's industrial policy toward steel over the past several years has been to promote consolidation and international competitiveness through technical upgrading. The NDRC has developed, and China's State Council adopted, two major planning documents for the steel industry in 2005 and 2009. The policy thrust of the NDRC's Iron and Steel Development Policy (2005) was to promote further consolidation and policy intervention in the steel industry.[18] The NDRC's Steel Revitalization Plan (2009) provided the industry with RMB 15 billion in subsidized loans for technological upgrades and put the NDRC in charge of brokering cross-provincial steel mergers.[19]

In short, the GOC has been engaged in top-down economic and industrial planning and the steel industry has been an important focus of those plans. The government did not leave the development of the steel industry to market forces. Instead, it designed and implemented plans for the industry aimed at consolidation and enhancing the industry's competitiveness.

B. The GOC exercises significant control over SOEs

To facilitate its industrial policies and planning, the GOC owns more than 100,000 enterprises in China.[20] Known as state-owned enterprises ("SOEs"), these entities generally exist in sectors that the government views as important for strategic or other reasons. The GOC has maintained high levels of ownership in these sectors, even as it has allowed privately owned firms to dominate production in other industries. The nature, extent, and objectives of state ownership in general,

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[15] Zhu Rongji, "Report on the Outline of the Tenth Five-Year Plan for National Economic and Social Development (2001)." (March 5, 2001).
[16] 11th Five Year Plan (Translation) "Drive advantaged enterprises to carry out alliance, cross-regional merger and reorganization, and increase industry concentration with focus on automobile, iron and steel, cement, machine building, electrolytic aluminum, rare earth, electronic information and pharmaceutical industries, etc."
[17] KPMG. "China's 12th Five-Year Plan: Iron and Steel" (May 2011).
[18] Jeffrey D. Wilson. "The Baosteel Group: A National Champion among National Champions" in Xu Yi-Chong, ed., *The Political Economy of State-owned Enterprises in China and India.* New York: Palgrave McMillan (2012) at 191-192. "Taken together, the initiatives called for a state-orchestrated acquisition-then-upgrading process, under which the more efficient top-ten national champions would first merge with, and then technologically upgrade, medium-sized firms from the key enterprises group."
[19] Wilson at 192.
[20] The precise number of SOE's owned by all levels of government is difficult to quantify because this information is not disclosed directly. See U.S.-China Economic and Security Review Commission. *2012 Report to Congress* (September 2012) at 49.

and within the steel industry specifically, offer further indication that steel prices in China are not reliable for use in antidumping calculations.

It is widely acknowledged, even in China, that corporate governance of China's SOEs and government-owned banks are inconsistent with those of modern-market economies and create an unequal playing field between SOEs and private-sector firms.[21]

Although SOEs have boards of directors and other trappings of modern corporate governance, the GOC and the CCP are able to influence management decisions in ways that do not occur in modern corporations. SOEs in China have two management structures. Aside from the standard corporate structure, which includes a board of directors, a chairman of the board, a chief executive officer, and other senior executives, there exists a CCP organizational structure whose members make all important business decisions for the SOE. The key players in the business management structure are frequently drawn from the ranks of the party structure.[22]

China's government and the CCP have many levers of control over SOEs. Specifically, the government owns the SOEs, chooses their top executives, and provides both broad strategic and specific guidance. The government also maintains a number of financial levers of control.[23]

In 2003, the Chinese government created the State Asset Supervision and Administration Commission ("SASAC") of the State Council to exercise ownership of state-owned enterprises on the government's behalf. [24] The State Council is China's highest organ of state administration.

SASAC was established via the "Interim Regulations on Supervision and Management of State-Owned Assets of Enterprises." The regulations established a central SASAC as well as sub-national SASACs associated with provincial and municipal governments. According to its English language Web site, the central SASAC "performs the responsibilities of investor, supervises and manages State-owned assets of enterprises" on behalf of the State Council.[25]

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[21] The World Bank and Development Research Center of the State Council, the People's Republic of China. *China 2030: Building a Modern, Harmonious, and Creative High-Income Society (Conference Edition)*. (Hereafter *China 2030*.) Washington, DC: The World Bank (2012) at 21. "Reforms of state enterprises and banks *would help align their corporate governance arrangements with the requirements of a modern market economy* and permit competition with the private sector on a level playing field." (Italics added.)

[22] For a detailed description of how the CCP controls management in SOEs from strategic and pillar industries, see, Bo Kong. *China's International Petroleum Policy.* Prager Security International (2010) at 25-26.

[23] Mixin Pei. "The Dark Side of China's Rise." *Foreign Policy*. (February 17, 2006).

[24] Barry Naughton. *Top-Down Control: SASAC and the Persistence of State Ownership in China*. Paper presented at the conference on "China and the World Economy" Leverhulme Centre for Research on Globalisation and Economic Policy (GEP), University of Nottingham (June 23, 2006).

[25] Decree of the State Council of the People's Republic of China No. 378. Interim Regulations on Supervision and Management of State-owned Assets of Enterprises. May 27, 2003. Article 12.

As part of its duties, SASAC appoints executives to the SOEs under its control. For China's most important SOEs, this duty is carried out by the CCP's Central Organization Department ("COD"). This department selects top leaders in China's government, economy, and society and is considered vital to enforcing loyalty to the Communist Party.[26]

The close connections between the GOC and SOE management, and their tendency to result in market distortions, were acknowledged in the study prepared by the World Bank and the Development Research Center of China's State Council:

> "More so than in other economies, state enterprises in China enjoy close connections with government, thanks to their special status. State enterprise management and government officials usually support each other—management often accepts informal guidance from government officials and, in return, state enterprises are more likely to enjoy preferential access to bank finance and other important inputs, privileged access to business opportunities, and even protection against competition."[27]

The GOC considers its ownership in the steel industry to be important. In 2006, the GOC identified a number of key sectors over which it would maintain significant ownership stakes. Specifically, it planned to maintain absolute control over seven key industries (defense, electricity generation and distribution, petroleum and petrochemicals, telecommunications, coal, civil aviation, and waterway transport) and to maintain a somewhat strong influence over seven other industries, including steel.[28]

As a result of government ownership in the steel industry, SOE producers in the industry are not profit maximizing entities. In 2012, a steel policy researcher at the Chinese Academy of Social Sciences stated that "The big state-owned mills are motivated not so much to seek profits but to seek government support….There is actually no mechanism to put them out of business, no sense of survival of the fittest, and that is probably the biggest problem facing the sector."[29]

Consistent with the importance placed on the steel industry by the GOC, production in the industry is dominated by SOEs. A study in 2007 found that 19 out of China's top twenty steel groups were majority-owned or controlled by the government.[30] Thus, a high proportion of steel

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[26] See Pei and Naughton.
[27] *China 2030* at 26.
[28] *Id.*
[29] "In China's Floundering Steel Industry, the Burden of Politics." *The International Herald Tribune.* May 4, 2012. (Hereafter, *Burden of Politics*) http://www.nytimes.com/2012/05/04/business/global/in-chinas-floundering-steel-sector-the-burden-of-politics.html?_r=1 (Downloaded August 1, 2015.)
[30] Alan H. Price, Timothy C. Brightbill, Christopher B. Weld, and D. Scott Nance. *Money for Metal: A Detailed Examination of Chinese Government Subsidies to Its Steel Industry*. (July 2007) at 10.

industry output was accounted for by firms that were not only government-owned, but whose decisions regarding investment, output, and prices were not motivated by profit maximization. Even today, most of China's top steel producers are government owned.[31]

SOE steel producers in China are owned by SASACs at different levels of government. Steel producers at the subnational level are frequently important sources of jobs for local economies, as well as tax revenues. As a result of these government incentives, it is difficult to remove inefficient steel production capacity from the market.[32] This excess steel capacity, as well as surplus production, puts downward pressure on steel prices in China at any level of domestic demand, benefitting industries that use steel as production inputs. These activities also serve to make Chinese steel prices unreliable for use in antidumping calculations, and necessitate the use of the NME provision.

C. GOC policies distort the supply and demand of steel in other ways.

The GOC has conducted its industrial policy for the steel industry with the goals of building a large and internationally competitive steel industry, increasing export competitiveness of value added steel and steel using products, and maintaining employment and tax revenues generated by steel producers. These goals have been accomplished by reducing the costs of key inputs that are under government control; through preferential bank financing, particularly for SOEs; and by allowing SOEs to raise money from capital markets.

Steel is an energy intensive industry, using large amounts of electricity and coal. In China, the electricity generation, electricity distribution, and coal mining industries also have high proportions of government ownership. Prices in these industries can be controlled by the GOC. For example, China's chief economic planning body, the NDRC, sets electricity prices for various provinces in China.[33] SOEs control both the generation and the distribution of electricity in China. [34] One study found that total subsidies to the Chinese steel industry increased sharply

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[31] In 2014, nine out of ten of China's top steel producers by volume are state-owned or state-controlled. The Shagang Group is the exception. See http://www.worldsteel.org/statistics/top-producers.html.

[32] "Trim Excess Capacity to Put China on Path to Sustainability." *Caixin.* (March 4, 2015). "Thus, instead of winding up the inefficient companies, local governments are helping them to tide over the bad times. Through the use of project approvals, loan levels, subsidies and tax rebates, openly or on the sly, local officials have been doing their best to prop up the "zombie" companies, particularly if they happened to be government owned. Overcapacity is hurting the economy, as can be seen in the lackluster annual data provincial governments released just before Spring Festival. The 2014 results were especially poor for Hebei and Shanxi provinces, for example, where the steel and coal sectors suffer severe overcapacity."

[33] Department of Commerce, International Trade Administration. "Issues and Decision Memorandum for Final Determination in the Countervailing Duty Investigation of Circular Welded Carbon Quality Steel Line Pipe (Line Pipe) from the People's Republic of China." (11/17/08) at 29.

[34] State Grid Corporation, an SOE, dominates the distribution of electricity in China.

after 2003.[35] China has also enacted a number of export restraints on steel inputs.[36] By limiting exports, the GOC creates artificially low prices that reduce the production costs of domestic steel producers. These lower input costs reduce the marginal cost of steel production in China, leading to a lower market price of steel.

There is broad recognition, even within China, that the country has used cheap financing to grow capital intensive industries and exports. In a sweeping assessment of China published in 2012, researchers from the World Bank and the Development Research Center of China's State Council stated:

> There is broad recognition in China—as reflected in the 11th and 12th Five Year Plans—that the country's pattern of investment and growth has become largely unsustainable. Spurred by high savings, cheap finance, and export-oriented policies, China's impressive growth rate has been capital intensive, industry led, and export dependent for several years.[37]

That report also noted that "the close links between the government, big banks, and state enterprises have created vested interests that inhibit reforms and contribute to continued ad hoc state interventions in the economy."[38]

A recent World Bank Report on China, which was posted on the Internet and then removed, revised and reposted,[39] reiterated that the GOC continues to distort China's market for loans: "[I]nstead of promoting the foundations for sound financial development, the state has interfered extensively and directly in allocating resources through administrative and price controls, guarantees, credit guidelines, pervasive ownership of financial institutions, and regulatory policies. These interventions have no parallel in modern market economies, and have subordinated the role of owner to that of overarching promoter, and subordinated the role of regulator to both." [40]

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[35] Usha C. V. Haley and George T. Haley. *Subsidies to Chinese Industry*. New York: Oxford University Press (2013) at 67-69.
[36] United States Trade Representative. "WTO Case Challenging China's Export Restraints on Raw Material Inputs. (June 2009). https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2009/june/wto-case-challenging-chinas-export-restraints-raw-materi. (Downloaded August 1, 2015.) "China maintains a number of measures that restrain exports of raw material inputs for which it is the top, or near top, world producer. These measures skew the playing field against the United States and other countries by creating substantial competitive benefits for downstream Chinese producers that use the inputs in the production and export of numerous processed steel, aluminum and chemical products and a wide range of further processed products."
[37] *China 2030* at 19.
[38] *China 2030* at 25.
[39] Mark Magnier. "World Bank Deletes Critical Passage on China." *The Wall Street Journal*. (July 3, 2015).
[40] World Bank. *China Economic Update*. (June 2015) at 28-29.

The provision of low-cost credit to certain sectors had resulted in "wasteful investments, excess capacity, and weaker loan portfolios." The World Bank's report characterizes Chinese government control over financial institutions as being pervasive and states that "these institutions have been a major conduit for direct state interventions."[41]

Despite the fact that China has reduced government ownership of its economy, the state remains a major actor in the industrial and financial sectors, and in the economy overall. For example, although China has an equities market, listed companies of SOEs are the dominant players in the market and account for the majority of market capitalization.[42] According to the World Bank, the GOC formally owns of 65 percent of commercial bank assets but has de factor control of 95 percent of assets.[43]

SOE steel suppliers have received preferential access to capital from state-owned banks, including policy banks. According to one account of Baosteel, "Financial Support was offered to the firm by channeling concessionary loan finance through the state-owned banking system—either through state-owned policy banks that provide 'policy finance' on concessionary rates for state-targeted investments, or through state-owned commercial banks whose purpose is to finance SOE activities in line with State-mandated industrial plans."[44] Local branches of the major state-owned banks as well as local government financing entities are also active in supporting SOE steel producers.

In order to support even more rapid growth and technological upgrading, the GOC has encouraged the largest SOE steel producers to list their shares in capital markets. These "listcos" benefit from access to equity capital, but the SOE generally maintains sufficient control by holding a majority of shares, or because most other shareholders are passive and/or associated with the government and unlikely to interfere with management. According to Derek Scissors of The Heritage Foundation:

> "The discussion of SOEs has been undermined by a fundamental error: the conflation of restructured, share-holding firms with the truly private sector. Share-holding SOEs are manifestly not private actors and assessments of the corporate sector that assume so are fatally flawed from the outset."[45]

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[41] *China Economic Update* at 29-30.
[42] Derek Scissors. *The Rise and Fall of Chinese State-Owned Enterprises*. Testimony before the U.S.-China Economic and Security Review Commission. (March 31, 2011).
[43] *China Economic Update* at 30.
[44] Wilson at 193.
[45] Derek Scissors. "The Fall and Rise of Chinese State-Owned Enterprises." Testimony before the U.S.–China Economic and Security Review Commission. March 30, 2011.

The GOC's cost reducing and financing practices have allowed SOE steel producers to significantly expand production capacity. Despite the rapid growth of the Chinese economy, the industry has been in a constant state of overcapacity for a number of years, as is demonstrated below. Likewise, Chinese steel prices have remained well below levels prevailing in other international markets.

Private steel producers in China are not immune from the effects of GOC industrial policies. Although many lack the same preferential access to bank financing enjoyed by SOEs, they do benefit from preferential pricing of other inputs such as electricity. Moreover, some of the non-state-owned steel producers in China have very close ties to the government and benefit from government subsidies.

For example, Hebei Jinxi Iron & Steel Corporation was restructured during 2001-2003 but continued to have close government ties. The two largest owners of China Oriental Group the non-state entity that came to own most of Hebei after its IPO, were controlled by the SOE's former chairman and the grandchild of a former head of China's metallurgy ministry, respectively. Documents from a subsequent proxy battle between the two owners demonstrate that private firms respond to the GOC's plans and benefit from subsidies as well:

> According to company management, China Oriental has "focused, in line with PRC government policies, on improving its competitive edge by enhancing its product mix and production efficiency." Management further noted that "China Oriental will continue to maintain its strategic position and diversify its product mix in line with PRC government policies." And, assuming that these private steel companies toe the party line, the rewards are substantial. Proxy documents indicate that the privately-owned steel mill continues to benefit from government largesse, including an RMB 145 million loan from the local government at an interest rate equal to China's official deposit rate, subsidy income, a reduced effective tax rate due to the firm's status as a foreign invested firm, and the provision of industrial facilities for less than market value.[46] (*Notes omitted)*

The following reports examine how Chinese policies have affected NAFTA economies. Together, the reports demonstrate that China's prices are still not market determined, particularly in the steel sector, and that using those prices in antidumping calculations will harm NAFTA steel producers and NAFTA overall.

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[46] Alan H. Price, Timothy C. Brightbill, Christopher B. Weld, and D. Scott Nance. *Government Ownership and Control of China's 'Private' Steel Producers*. (October 2007) at 2-3.

IV. The Mexican Report: Has China become a Market Economy?

By Manuel J. Molano, IMCO[47]

Abstract

This study uses a general equilibrium model to illustrate the impact of China's policy distortions on global and Chinese welfare. First, China is treated as an single country that subsidizes its industries and is subject to antidumping duties in its export markets. This model is used to compare the economic effects of dismantling China's subsidy regime on the one hand and conferring market economy treatment to China on the other, assuming that China also reduces its duties as part of the bargain. Second, China is modeled as the hub of a hinterland of production dispersed over several continents. This aggregation enables estimation of a shadow price for Chinese steel and insight into China's competitiveness vis-à-vis the NAFTA, EU, and the rest of the world. In the case of steel, it is apparent that the price competitiveness of China's steel exports is artificial, and that China can only compete in international markets through dumping. If China is allowed to continue exporting its artificially low cost steel and other countries, including NAFTA, must treat Chinese prices as market economy prices in antidumping investigations, steel industries outside of China will contract dramatically. These simulations reveal that (a) comparatively, global and Chinese economic welfare benefit more from reducing subsidies in China than from applying market economy treatment to China; (b) current market distortions in China's steel industry make steel production outside of China increasingly difficult; (c) the dominance of China in the production of steel and other commodities creates a risk of supply chain disruption in NAFTA and other countries farther from the Chinese hinterland; and (d) NAFTA and China's other trading partners should require further economic reforms from China before conferring market economy status on China for purposes of antidumping calculations. The final portion of the paper outlines some policy recommendations for Mexico, NAFTA, and the WTO.

A. Introduction

December 2016 marks the fifteen-year anniversary of China's accession to the WTO. Some have suggested that China's Accession Agreement requires WTO members to confer market economy treatment on China for dumping calculations. Whether or not such a change is required by

[47] This paper benefited greatly from conversations with Jaime Serra, Roberto Newell, Juan Pardinas, Andrew Szamosszegi, Robin Somerville, Jesus Flores, Guillermo Vogel, Salvador Quesada, José Luis de la Cruz, the professional staff at IMCO, and other analysts and industry participants. All remaining errors are exclusively mine. Please direct comments to manuel.molano@imco.org.mx .

China's Accession Agreement is a legal question. But, in fact, China's trading partners can abandon the non-market economy (NME) methodology on their own; they do not have to wait for 2017. The economic ramifications of taking such a step are potentially large, and NAFTA governments should not treat China as a market economy (ME) for antidumping purposes before conducting sound economic analysis of the costs and benefits of such an approach.

China's transformation into a global manufacturing powerhouse over the last 15 years has had many important implications. Poverty rates in that country fell, and it witnessed the fastest economic development in the history of humanity.

Yet, many significant distortions remain in the Chinese economy. State ownership of firms, state financing of strategic industries such as iron and steel, and non-transparent price formation have not only facilitated the expansion of Chinese industries, but also created large imbalances in world trade and in China's domestic economy. Given the extent of these distortions, it is ironic that the debate accompanying the 15-year anniversary is centered on whether WTO-members are obligated to graduate China to ME status, rather than on China's continued interference with market mechanisms. The underlying assumption is that treating China like a market economy would benefit China's economy. This is likely true. However, as China's welfare would also increase if it eliminated its market distorting subsidies and preferences. Therefore, it is relevant to ask which policy is better for Chinese and global welfare: for China to eliminate its subsidies and distorting policy preferences or for China's trading partners to treat China like a market economy? It seems logical that if Chinese welfare would increase more by dint of reforms in China than by market economy treatment, the superior policy is for China to eliminate its distortions. For NAFTA, it makes little sense to abandon a policy that aims to offset the trade effects of Chinese distortions while they still exist, especially when the benefits conferred on China are less than China could achieve through domestic reforms.

In the case of the iron and steel industry, China has gained a significant share of global market share by charging prices well below those of major competitors in Europe and the NAFTA. For example, in mid-2015, Chinese steel prices were lower than those in U.S. and European markets and were declining along the whole range of commodity products, while North American and European steel prices were rising, as shown in Table IV-1.

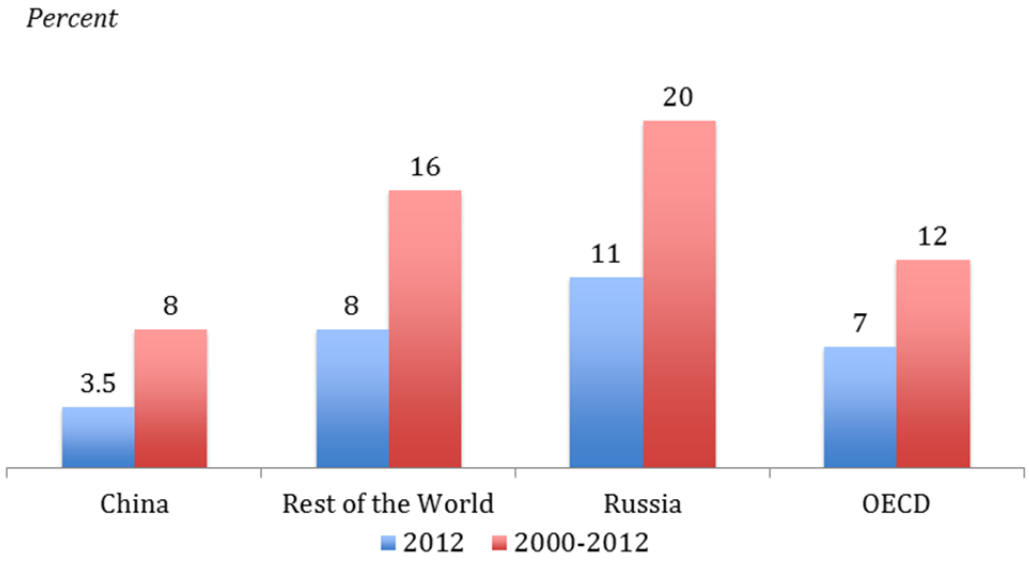
Table IV-1. Steel Prices, June 8, 2015

Region, commodity	Dollars per metric ton (net ton) [gross ton]	Percentage change (from prior week)
USA, East of the Mississippi		
Hot-rolled band	514 (467)	0%
Cold-rolled coil	645 (585)	1%
Standard plate	635 (576)	2%
Shredded scrap*	273 [278]	8%
#1 Heavy melting scrap	245 [248]	9%
#1 Busheling scrap	266 [270]	8%
Mainland China		
Hot-rolled band	321	-1%
Cold-rolled coil	412	-2%
Rebar	299	-3%
Standard plate	317	-3%
World Export Market		
Hot-rolled band	383	1%

Source: steelbenchmarker.com. Prices dated on June 8th, 2015 for USA -- FOB mill; Western Europe and China -- Ex-works; and World Export Market -- FOB port of export. For USA steel scrap -- delivered to the steel plant. *For shredded scrap the region is "for all but the West Coast".

Though China has made impressive strides in transforming its economy from communism toward capitalism, the country's economy continues to be state-dominated in ways that prevent free-market outcomes. China's policy environment for the steel industry allows underperforming and money losing steel producers to continue operating. In contrast, steel mills in market economy countries will shut down after continued losses. Even when China's economy has been experiencing strong growth, which should translate into strong financial performance by domestic enterprises, China's steel producers have tended to underperform financially. For example, in 2012, the consultancy Laplace Conseil reported that "China, the fastest growing market, had the lowest economic result" both in that year and over the 2000-2012 period. In July 2013, the consultancy McKinsey & Co., reported to the OECD Steel Committee that roughly 65 percent of China's large players in the steel industry operated with negative cash flows during the 2011-2013 period, and that even in good years, a large share of companies in the industry experienced negative results. McKinsey also noted that the EBITDA-to-sales ratio of Chinese firms was below 10 percent during the 2000-2012 period. This compares poorly to the 16 percent rate of return that McKinsey believes is the minimum to sustain steel production. Yet despite these poor financial returns, the Chinese industry expanded substantially while capacity in the rest of the world was essentially flat. Absent changes in capacity, McKinsey predicts that the Chinese economic slowdown will lead to a prolonged period of excess capacity in Western Europe, developed Asia, and China.

Figure IV-1. Average EBITDA/Sales by Region



Source: Laplace Conseil (2012).

The growth of China's steel output has been staggering. From 2004 to 2013, Chinese production of crude steel expanded rapidly and by 2013 accounted for half the world's production. No other region of the world has grown as rapidly and many countries and regions have seen their shares of production severely curtailed. North American steel output declined 11 percent from 2004 to 2013 in contrast to China's increase of 201 percent, as shown in Table IV-2.

Table IV-2. World Production of Crude Steel

Region	*Percentage change (2004-2013)*	*Market Share (2013)*
China	201%	50%
India	149%	5%
Other Europe	69%	2%
Turkey	62%	2%
South Korea	39%	4%
Japan	-2%	7%
Rest of the World	-2%	13%
North America	-11%	7%
EU-27	-18%	10%

Source: IMCO, with worldsteel.org data.

China's exports have expanded at an even more rapid rate than its production. From 2004 to 2013, steel exports from China grew 207 percent, compared to a 21 percent growth rate for North America.

Table IV-3. Exports of Semi-finished and Finished Steel Products

Region	*Percentage change (2004-2013)*	*Share in 2013*
China	207%	15%
South Korea	93%	7%
India	84%	2%
Turkey	32%	4%
Other Europe	24%	5%
Japan	22%	10%
North America	21%	6%
EU-27	-7%	33%
Rest of the World	-28%	17%

Source: IMCO, with worldsteel.org data.

The implications of current trends are disturbing. Current rates imply that China will produce all the world's steel within 16 years and would completely dominate export markets in 23 years. Though such an outcome may seem unlikely, there is precedence for China achieving market dominance. For example, China came to monopolize the production and export of rare earth minerals for a number of years, and then imposed export quotas to encourage manufacturers to move production of rare-earth-using products to China.

B. The GTAP database and the Rutherford General Equilibrium Model (GEM) GTAP in GAMS

General equilibrium models are the workhorses of trade policy analysis. The Global Trade Analysis Project (GTAP) is a fully documented, collaborative effort of researchers, put forward two decades ago by the Centre for Global Trade Analysis of the Department of Agricultural Economics at Purdue University. GTAP is probably the largest collaborative effort of policy analysts in the world. The GTAP Database version 8, which was used to run the models in this paper, has information on 113 countries/regions, 57 commodities and 5 primary factors.

The principal programming language for modeling with GTAP is GEMPACK, a software package developed and maintained by the Centre of Policy Studies in the University of Victoria, Australia (formerly at Monash University). In order to avoid issues with closed-form coding, we chose to use an implementation of GTAP programmed in the GAMS programming language by Dr. Thomas Rutherford from University of Wisconsin-Madison. The world economy is

represented essentially as a system of non-linear equations (Rutherford, 2010). Other than regional aggregations, there were no modifications made to the GTAP 8 Database or to the standard closure. The simulations herein consider the effects of ME treatment on all countries and traded goods sectors. Market economy treatment is modeled by assuming that countries improve access to Chinese imports in all commodities, while at the same time benefitting from improved access to China.

C. Effects of China accession as a Market Economy (ME) under WTO rules

The GTAP database and model provide many options for analyzing trade policies and competitiveness. First, we use the database to assess China's competitiveness in steel production. Then we compare the welfare benefits of the world granting ME treatment to China to the welfare benefits of China eliminating its export subsidies.

1. Using the GTAP database to reveal shadow prices

In the context of antidumping investigations, the prices resulting from government-influenced markets cannot be used to accurately measure the extent of Chinese dumping. Dumping occurs when the export price is below "normal value," which can be determined by examining home market prices, third-country prices, or the cost of production. As described in Chapter II, the NME methodology is used for calculating antidumping margins for Chinese imports because the prices for steel and many other commodities in China are not sufficiently market determined.

To estimate a normal value for China, many countries obtain factor values from a surrogate country that is a producer of comparable merchandise and is at a level of economic development comparable to China. Once normal value is established, the dumping margin is calculated and an ad-valorem antidumping duty is usually applied to offset the dumping margin. When applied in antidumping investigations of imports from China, the NME methodology frequently confirms that the imports have been dumped.

By applying a different methodology to Chinese steel, we reaffirm the underlying rationale for applying the NME methodology – that Chinese steel prices are unreliable and artificially low – remains valid.

Many of the inputs necessary to produce steel in China must be imported. Oil has to be transported from Saudi Arabia or far-flung places such as Venezuela or Brazil. Australian or African ore is another essential input to production. If we calculate the price of these inputs in their countries of origin and estimate the transport costs to China in order to produce steel, we come up with a revealed shadow price of Chinese production for all steel commodities. The transport cost of these inputs is not trivial. The value-added of these inputs in their countries of origin is very low; hence, transportation makes up most of the cost.

GTAP allows for ad-hoc aggregation of trade areas in order to estimate various policy scenarios. We aggregated a special trade area consisting of China and its main trading partners. GTAP also has a module that automatically calculates the transport costs within that ad-hoc trading area, and between the aggregated economy and its trading partners.

According to UNCTAD trade data, China imports its inputs mainly from Australia, Saudi Arabia, Angola, the Russian Federation, Iran, Brazil, Oman, Iraq, Venezuela, Indonesia, and the United Arab Emirates. These countries and China are aggregated into a Chinese economic area ("EECHINA").[48] In equilibrium, this ad-hoc aggregation of China and its input suppliers reveals a relative-price structure shown in Table IV-4.

Table IV-4. Commodity Steel Relative Prices, Including Transport Prices, in GTAP Equilibrium (as a percent of the NAFTA price)

	EECHINA	*NAFTA*
Minimum	129%	100%
Median	**257%**	**100%**
Maximum	269%	100%

Source: IMCO, using the GTAP 8 / Rutherford GEM model.

Table IV-4 reveals that the median EECHINA steel price should be almost 2.6 times the NAFTA price. At a minimum, the EECHINA steel price should be 1.3 times the NAFTA price. The steel shadow prices for EECHINA revealed by the model are high because China incurs high transport costs importing low value-added inputs from faraway regions. The high shadow price in the EECHINA region underscores the notion that China's steel prices are not sufficiently reliable for use in dumping calculations and demonstrates that current Chinese steel prices are artificially low. Were NAFTA governments to abandon prematurely the right to use the NME methodology, they would be forced to use these artificially low Chinese prices in dumping calculations, in effect rendering antidumping laws moot for dealing with dumped steel from China. Other NAFTA industries that compete against artificially low priced dumped imports from China would be vulnerable as well. The inability to counter Chinese dumping would have long-term consequences because China has already demonstrated that it is willing to distort the market for its advantage once a monopoly is established by limiting access (such as export quotas for rare earth minerals) and charging higher prices (as was the case with vitamin C). One cannot assume that China will follow a different path once it achieves global dominance in steel production and trade.

[48] The United States is also a major provider of inputs to China but is excluded from EECHINA to facilitate comparison with NAFTA.

Table IV-5 below indicates that the loss or severe reduction in the output of the NAFTA steel industry would have direct effects on the GDP of NAFTA countries. The NAFTA automotive industries, which have a significantly larger economic footprint, would also be at risk were China to limit access to steel once it achieved sufficient market share, as was the case with rare earth minerals. With a dominant market share in steel production and trade, China would have a strong incentive to promote the shift of high value added production to China, and the leverage to do so.

Table IV-5. Weight of Steel and Automotive Industries, NAFTA Countries in the GTAP Model

Country	Steel		Automotive	
	% of GDP	*Output ($bil.)*	*% of GDP*	*Output ($bil.)*
Mexico	1.50%	20,450	4.70%	60,288
United States	0.60%	105,600	2.20%	387,433
Canada	0.90%	16,080	4.00%	71,466

Source: IMCO, with GTAP 8 database.

2. Comparison of China ME and a reduction of Chinese export subsidies

We chose to model the effects of graduating China to ME status by imposing global duty reductions on imports from China on a Most Favored Nation basis.[49] The rest of the world would gain improved access to China in a similar fashion. Thus, the simulation reduces import duties on Chinese exports and Chinese imports. The rationale for this approach is that other countries are likely to demand improved access to China as the price for granting ME treatment to China.

In order to compare the effect of conferring ME status to China with the effect of China dismantling its subsidies, a second simulation was conducted to estimate the welfare changes of China removing its trade-distorting subsidies, both for China and the representative agent in other countries of the world.

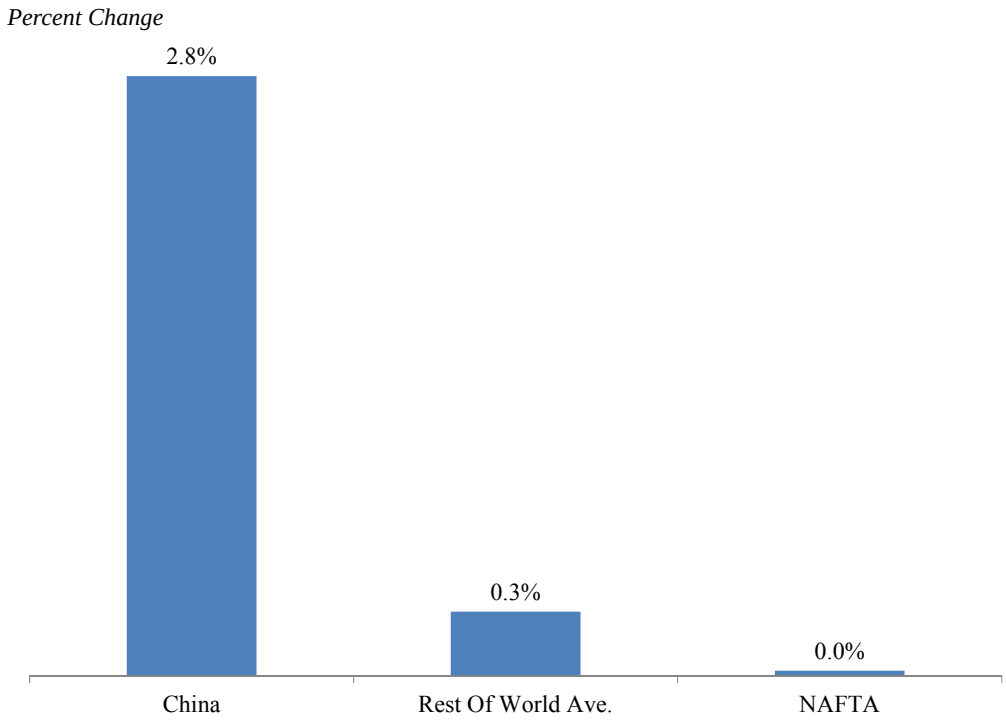
In this simulation, China and the main trading economies of the world are modeled as single countries with no regional aggregation. The results are discussed in the following section.

[49] Because the effective antidumping duty rates applied to China by each country are not known, we set as a target rate for each GTAP industry the lowest effective rate that each country grants to any third country in the GTAP database. These rates are applied to imports from China. Similarly, China's import duty rates for each industry are reduced to the lowest effective rate it charges on imports from its trading partners.

a) Recognizing China as a ME

In the China ME scenario (ME+), the welfare of representative agents in the world will grow, albeit marginally. In general the change in welfare is small, except in China, where some of the poorest people in the world are subsidizing steel, an expensive commodity, for richer consumers, especially in the industrialized world. On average, NAFTA achieves virtually no gain from the China ME+ scenario, while Rest-of-World experiences a modest increase, largely concentrated among the countries that provide China with raw materials. In contrast, the representative agent for China experiences a gain of 2.8 percent, as shown in Figure IV-2. The duty reductions in China largely offset the adverse effects on NAFTA countries of unilaterally granting ME treatment to China. Put differently, the adverse effects of China ME on NAFTA can be reduced if China provides significantly better access to imports from NAFTA.

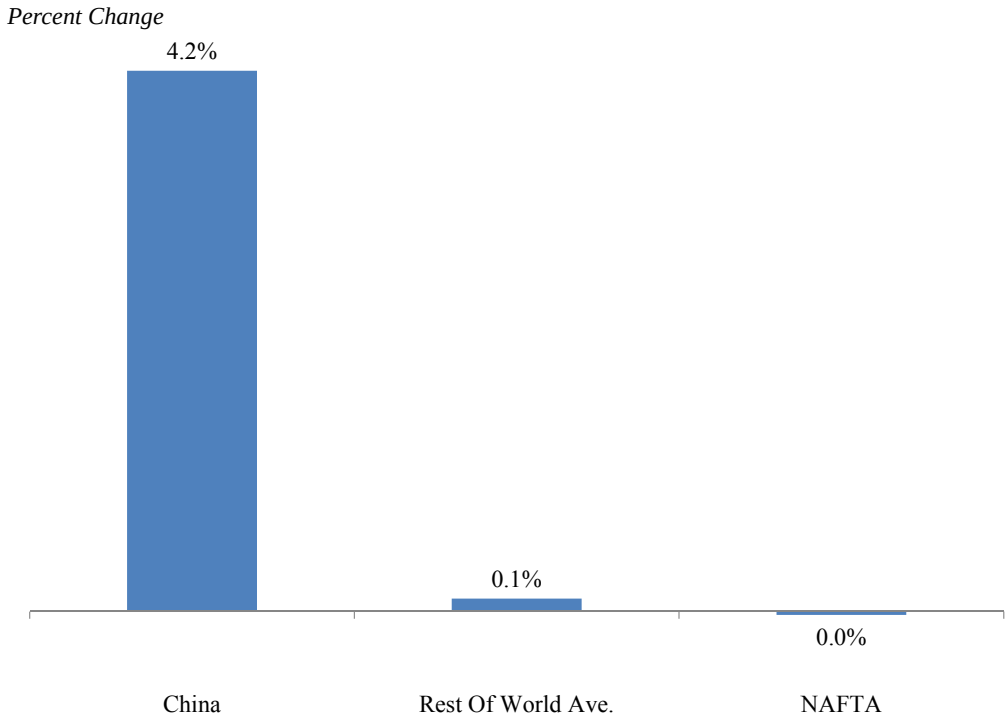
Figure IV-2. Changes in Representative Agent Welfare in the ME+ Scenario



Source: IMCO, using the GTAP 8 / Rutherford GEM model.

The welfare effects of eliminating Chinese export subsidies are summarized in Figure IV-3. China's welfare and overall global welfare increase more with the removal of China's subsidies than with ME treatment. For NAFTA overall, the welfare benefit of China removing its export subsidies is limited because the reduction of imports from China is offset by other factors.

Figure IV-3. Change in Representative Agent Welfare Dismantling the Chinese Structure of Trade-Distorting Subsidies



Source: IMCO, using the GTAP 8 / Rutherford GEM model

D. Conclusion

The answer to the question posed in this paper's title, has China become a Market Economy, is "no." China is not a market economy, and hence, it should not be recognized as one for purposes of antidumping laws. Recognition as an ME should be conditioned on serious transformation of its economic policies, which history shows can be hard to achieve. China is too complex; its statistics are difficult interpret. The country is a multicolor prism that lures strangers and defies analysis: "Former US ambassador to China Winston Lord once declared the phrase *China expert* to be an oxymoron, while Nicholas Kristof and Sheryl Wudunn have described the job of professional China watcher as being nothing less than 'an exercise in humiliation'".[50]

The Chinese economy has become one of the central hubs of world production and trade, and continues to account for a significant share of global growth.[51] However, Chinese economic

[50] Ford, CA (2015), page 11.
[51] According to *The Economist* (June 15, 2015) China, India and the United States accounted for 80 percent of global growth in the first quarter, with China's contribution being the largest.

growth has slowed, and there is a significant probability that the era of rapid growth in China has drawn to a close. As China moves from a model of growth based on infrastructure construction to one based on consumption, domestic demand for Chinese steel will diminish significantly. Demand for steel in the rest of the world is likely to continue on its current path, but unless China allows market forces to "right size" its steel industry, Chinese steel producers will increasingly rely on export markets. If forced to calculate dumping margins using market economy methodologies, NAFTA production of steel is likely to decline significantly.

But supply disruptions could arise before then. China plays a central role in the global trade network. With the world increasingly reliant on Chinese steel and other inputs, any economic disruption in China could have severe economic consequences for NAFTA and the rest of the world. Thus, while it is best for China to adopt market economy practices, it is in no one's interest to have a messy transition that disrupts Chinese output and global trade.

Therefore, China should be encouraged to adopt policies that facilitate an orderly transition to a market economy under WTO rules. Given the extent to which China's policies facilitate dumping in commodities such as steel, many governments are naturally reluctant to provide trade concessions to the Chinese economy that would lead to import surges that harm workers and firms in importing countries. By continuing its significant market interventions, the Chinese government has failed to meet the expectations of WTO members that its economy would be market oriented by December 2016. Given this failure, the question for NAFTA governments is whether an immediate change to ME status would hasten China's transformation, or delay it. The answer is that China is not yet ready for ME treatment, and that granting ME status to China before it is ready would remove an incentive for China to modify its behavior.

1. Recommendations for Mexico

Mexico faces an important dilemma in terms of its policy toward China. On the one hand, seeking temporary protection from dumped imports through use of the antidumping laws and NME provision raises steel prices in Mexico. However, the continued use of the NME methodology to offset dumping is the correct position against the Chinese model of State capitalism that artificially depresses Chinese steel prices.

While now is not the time to grant ME status to China, Mexico should acknowledge that it would reconsider granting ME status to China once there are true structural changes in China. China and Mexico would be better off if China dismantled its distorting subsidy regime and make its prices transparent.

However, Mexico's policy history with China is one of asymmetry and disdain from the Chinese side. Mexican ambassadors to China have had problems in maintaining a functional diplomatic relationship with China. The Calderón administration (2006-2012) sent a powerful signal to China when president Calderón met with the Dalai Lama in 2011. The Peña administration has had some disagreements with the Chinese regarding cancelled infrastructure projects.

The effective benefit that Mexico accrues from cheap Chinese steel is marginal. The claims by the Mexican automotive industry that restrictions on the import of Chinese steel will hurt the competitiveness of their sector are largely unfounded. Using GTAP, we estimated that steel imports have a relative weight of 0.085% of the value of the automotive production chain, and 0.88% of the gross value of all the production chains in the economy.

The analysis here is not a defense of protectionism, which has hurt the competitiveness of production chains in Mexico in the past. Most of Mexican growth depends on the competitiveness of steel-consuming industries such as the automotive or home appliance industries; steel consuming industries should have access to sufficient volumes of steel. However, the short-term benefit of low-priced Chinese steel may come with a consequence as China increasingly dominates steel production. For this reason, Mexico should ensure sufficient access to steel by sourcing from alternative markets that price steel fairly, rather than becoming dependent on dumped Chinese steel. Mexico should also encourage economic reforms in China.

Absent policy changes in China, Mexico should continue to require that the NME methodology be used to calculate dumping margins for imports from China. In the median scenario for steel, our GEM analysis shows that the ad-valorem tariff could be as high as 157 percent. NAFTA producers of steel and steel commodities should commit to full utilization of their excess capacity to the extent possible and to investment in NAFTA steel to produce at the highest quality and lowest price possible. Dumped imports from China and policy uncertainty surrounding the NME debate currently discourage such investments. NAFTA steel producers should also create linkages with other growing economies that could fill any gaps should imports of steel be disrupted.

Other possible options for Mexico include the imposition of an auction system on imports from third countries, the imposition of quotas on imports from China, or negotiating voluntary export restraints (VER) to limit steel exports from China. These additional policies may be needed if continued export expansion by China's steel industry pushes third-countries to shift their exports to Mexico.

Although it is important to continue applying antidumping duties using the NME methodology, Mexico may wish to consider auctioning quotas on imports from third countries as well. This would ensure adequate quantities of steel for Mexican steel users. With an auction system, the market effectively determines the tariff-rate equivalent of the quota, and the Mexican treasury receives a significant portion of the rent derived from imports. The proceeds from these auctions can be used to create a fund to increase the cost competitiveness of the Mexican steel industry. This system was used during the Calderón administration to allot Mexican import quotas for sugar and toys.

If Mexico is unable to control Chinese imports through antidumping measures alone, the Mexican government can impose quotas directly on Chinese steel imports. Such quotas would

encourage Mexican steel users to diversify their sources of supply. The quota level can be raised as China abandons the policies that have created structural excess capacity in its steel industry.

Another possibility is to negotiate a VER agreement on steel imports from China. However, due to the asymmetry in the bilateral relationship, a VER is unlikely. Mexico is too small for the Chinese to notice, and needs its NAFTA and world partners to induce meaningful change in China.

Thus, we recommend that the Government of Mexico continue using the NME methodology on dumped imports from China and, if necessary, to adopt an auction quota scheme on steel imports from Non-NAFTA countries to deal with shifts in third-country trade patterns arising from the continued expansion of Chinese steel exports.

2. Recommendations for NAFTA countries

NAFTA and the rest of the world will benefit from China becoming a true market economy. It does not follow, however, that NAFTA should grant ME status to China right away. The benefit of being treated like a market economy in the antidumping investigations of NAFTA countries should be conditioned on China eliminating the economic policies that lead to excessive interference with market mechanisms in steel and other industries.

NAFTA must formulate a coherent China policy, coordinated among the United States, Canada and Mexico, that conditions ME status on China dismantling its export subsidies; revealing the true costs of different commodities; providing market disciplines for dealing with enterprise bankruptcies, including financial intermediaries; and allowing for more private investment in Chinese companies. Currently, China is a long way from achieving the kind of reform that would lead to market-determined pricing.

NAFTA governments should use appropriate cost references, such as the ones used in this paper, in order to induce better policy behavior from China, not to create new protectionist measures. Those measures currently suggest that China's steel prices are artificially low. At the same time, NAFTA industries need to work hard to ensure that they remain competitive, low-cost producers.

3. Message for China

Mexico, NAFTA, and the WTO should encourage China to dismantle its trade distorting subsidies, state finance, and state ownership of firms. The benefits of such a policy will accrue mainly to the Chinese salaried workers and consumers, who currently bear a high cost to subsidize low priced steel, some of which is exported to the rest of the world. The rest of the world will eventually pay for the cost of Chinese distortions if China comes to dominate steel production even further or if China suddenly finds that it is unable to continue its generous policy and financial support for the industry.

China must understand that a trade area is formed with considerations of geographical closeness and transport costs, not ideological affinity. The true cost of Chinese selective trade with

countries that have nothing in common with them except for political ideology will be very costly for the rest of the world in less than two decades, unless the production of strategic inputs such as steel is diversified in various regions of the world.

V. The U.S. Report: The Case for Continuing to Treat China as a Non-Market Economy

By Andrew Szamosszegi, Capital Trade, Inc.[52]

Abstract

The U.S. Report assesses the potential costs to the U.S. and NAFTA steel industries and economies if NAFTA governments unilaterally grant market economy (ME) treatment to China after December 2016. It reviews the history of U.S. antidumping investigations against China, with a focus on the steel industry, and describes how Chinese industrial policies are transmitted to the U.S. economy through dumping. China's industrial policy environment in strategic or targeted industries is prone to the creation of excess capacity that frequently results in artificially low prices. Import surges from China, when they occur, have adverse output and employment effects on the U.S. economy. This pattern is examined through case studies of the steel, oil country tubular goods, and solar panel industries. The case studies demonstrate why antidumping laws and the NME methodology are needed to deal with China's policy-induced dumping. The GTAP model and database are used to assess the potential economic effects on the U.S. and NAFTA steel industries and economies if NAFTA countries grant ME status to China prematurely. It finds that antidumping laws would be ineffective if China is given ME status because China's artificially low domestic steel prices would lead to low or zero margins. As a result of these lower duties -- applied to the steel industry alone -- the U.S. and NAFTA steel industries experience output losses of 10 percent while the U.S. and NAFTA economies experience welfare losses of 0.2 to 0.3 percent. In the United States, job losses range from 400,000 to 600,000 workers and capital stock declines both absolutely and relative to China. U.S. welfare and employment losses are somewhat larger using a different transmission mechanism that considers the increased risk faced by investors in tradeable goods sectors if China is given ME status prematurely. Scenario analysis finds the U.S. economy is better off maintaining the NME methodology regardless of what its NAFTA partners do.

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A. Introduction

The People's Republic of China joined the World Trade Organization (WTO) as its 143rd member on December 11, 2001.[53] At that time, China was widely considered a non-market economy because, despite economic reforms, it remained a centrally planned economy.

Because of the prominence of directed or otherwise controlled aspects of China's economy, negotiations to readmit China to the WTO took 15 years.[54] China's protocol of accession spells out China's commitments to reform its trade regime and economy. The protocol also provides transitional periods giving China time to bring its laws and policies into compliance with WTO measures and giving other WTO members time to apply special safeguards to cope with market distortions arising from rapid increases in imports from China.

For example, the protocol includes a transitional provision on price comparability in determining subsidies and dumping. This provision allows the importing WTO member to use an antidumping methodology that is not based strictly on Chinese costs if the Chinese respondents cannot demonstrate that their industry operates in accordance with market principals.[55] On the basis of this provision, China has agreed to allow the United States and other countries to determine the magnitude of Chinese dumping (i.e., sales below the price charged in the home market or below the cost of production) by using a methodology that does not rely on China's sales of the dumped product in its home market. In the United States, the Department of Commerce treats China as a "non-market economy," or NME, and calculates a duty to neutralize Chinese dumping by using costs in third countries instead of Chinese costs. The use of this methodology has been critical to slowing rapidly increasing U.S. imports from China in many product categories. It is almost certain that without the NME provision, imports from China would have caused significantly more economic disruptions in U.S. manufacturing industries such as steel, paper, and furniture, to name a just few.

Some argue that China's accession protocol entitles it to receive market economy treatment with respect to antidumping after December 2016.[56] Their rationale for changing the current policy is

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[53] Peter Wonacott. "China Formally Enters the WTO on Tuesday." *The Wall Street Journal*. (December 11, 2001).
[54] Ironically, China was one of the original contracting parties to the General Agreement on Tariffs and Trade in 1948. Jeffrey L. Gertler. *What China's WTO Accession is All About*. (Geneva: WTO Secretariat, 2001) at 1.
[55] "Protocol on the Accession of the People's Republic of China," ¶15, WT/L/432, (November 23, 2001). "The importing WTO Member may use a methodology that is not based on a strict comparison with domestic prices or costs in China if the producers under investigation cannot clearly show that market economy conditions prevail in the industry producing the like product with regard to manufacture, production and sale of that product."
[56] K. William Watson, *Will Nonmarket Economy Methodology Go Quietly into the Night?* Cato Institute Policy Analysis no. 763 (October 28, 2014).

that after 25 years of economic reform, China is no longer the type of command-and-control economy that the NME provision was designed to combat.[57]

Putting aside the legal arguments of this position, the economic effects of conferring market economy treatment on China while it is still an NME are potentially quite large. It would make no sense to undertake such a significant shift in policy and practice without considering the potential economic effects of such a change, both to the industries in question and to the economy overall.

The goal of this study is to examine how China's market interventions have affected the U.S. economy, and to assess the risk of eliminating the NME buffer after December 2016. The focus of this study is the U.S. steel industry, though impacts on other U.S. industries will also be considered.

Section B examines the application of antidumping laws to China using the NME methodology and with a focus on the steel industry. Section C examines the various direct and indirect effects of Chinese trade practices on the U.S. economy. Section D contains case studies on how Chinese industrial policies created excess capacity in the steel industry, including oil country tubular goods. The solar industry is also examined because China's policies in that industry in many ways parallel those in steel and practically wiped out the U.S. industry producing a high volume solar panel product. Section E provides an economic assessment of how the steel industry and the U.S. economy might be affected if the ability to apply the NME provision is lost. Conclusions are offered in Section F.

B. Applicability of NME provision to China

Currently, antidumping laws are administered by International Trade Administration of the Department of Commerce ("DOC") and the United States International Trade Commission ("USITC"). The DOC estimates the magnitude of the dumping margin by comparing the U.S. price of the accused import to a normal value based on home market sales, sales to third countries, or constructed value. As described above, the DOC aims to calculate a dumping margin that offsets the difference between the price of the dumped import and the non-dumped price. For market economy countries, the DOC bases the calculation on the difference between the dumped price and the price of the same product in the home country (i.e., the country of the dumpers). If the same product is not sold in the country of the dumper, the practice is to compare the price in the United States with the price of the same product in a third country market. If the dumped product is sold neither in the home country nor a third country market, then the DOC "constructs" the normal value by summing together the cost of all inputs plus adjustments to

[57] Watson at 2.

reflect overhead, selling expenses, and profit. For market economy countries, this constructed value is based on input prices in the home country. When applied to NME countries such as China, the prices for determining input costs are generally collected from a country of comparable economic development that is a producer of comparable products. As with market economy countries, the margin is set to offset the difference between the price at which the dumped imported product is sold in the United States and the non-dumped price. The calculated margins only go into effect if the USITC finds that the dumped (or subsidized) imports have injured, or threaten to injure, the relevant U.S. industry.

From 1949 to 1978, China was a command economy; government planners, rather than market forces, determined resource allocations. During this period, China was an insular economy, much like today's North Korea, and there was only minimal trade between the United States and China. According to the DOC's antidumping database, there were no AD investigations of imports from China during this period.[58]

Although the system of direct government control began to be dismantled in 1979, the legacy of China's command economy remains "large and complex"[59] with the state remaining the dominant player in urban China (where industry is concentrated).[60]

Thus, the NME provision began gaining traction in the United States just as China abandoned strict central planning. But as discussed above, China's trading partners recognized that market forces in China remained significantly curtailed and ensured that they maintained the ability to treat China as an NME for purposes of antidumping investigations. When Natural Menthol from China, the first U.S. antidumping investigation against China since the 1940s, was initiated in July 1980, [61] the DOC found that it could not use Chinese cost figures to calculate normal value and would instead utilize the NME methodology, with Paraguay serving as the surrogate country.[62]

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[58] According to the DOC's database of pre-1980 AD investigations, imports of "Ajinomoto" (MSG) from China were investigated in 1940 and imports of tung oil from China were investigated in 1947 and 1948. U.S. Department of Commerce, Enforcement and Compliance. AD/CVD Investigations (Federal Register History) (01/01/1980 - 12/31/1999) at http://enforcement.trade.gov/stats/iastats1.html.

[59] Barry Naughton. *The Chinese Economy—Transitions and Growth*. Cambridge: MIT Press (2007) at 55-56.

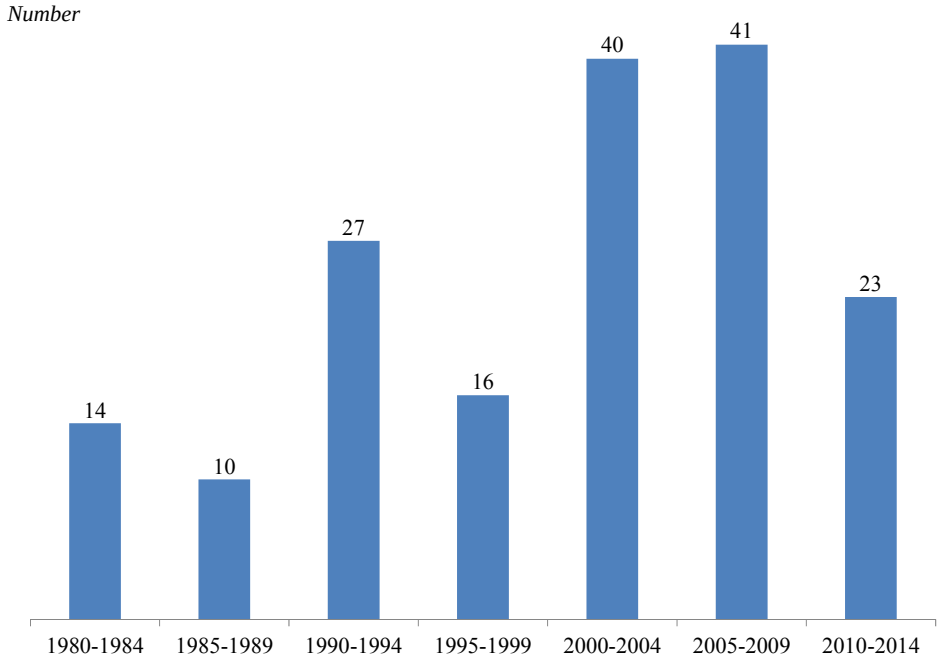
[60] Tony Saich. *Governance and Politics of China*. Third Edition. Palgrave McMillan (2011) at 281.

[61] U.S. Department of Commerce, Enforcement and Compliance. AD/CVD Investigations (Federal Register History) (01/01/1980 - 12/31/1999) at http://enforcement.trade.gov/stats/iastats1.html. The date is based on the Federal Register notice. The petition was filed in June.

[62] J. Mishell George, Damian T. Gullo, Daniel D. Stein. "Trade with the People's Republic of China: Current Status and Future Prospects," 3 Nw. J. Int'l L. & Bus. 21 (1981) at 37. In that investigation, the DOC found a dumping margin of 2.5 percent, but the USITC found that imports of natural menthol from China were not injurious to the domestic industry.

During the next thirty-five years, U.S. industries frequently attempted to use antidumping laws to cope with the importation of products from China. The DOC's antidumping database shows there have been 171 antidumping investigations against China since 1980.[63] The periods with the highest tally, 1990-94, 2000-04, and 2005-09, included periods in which the U.S. economy was in recession, making U.S. industries especially vulnerable to injury from dumped imports.

Figure V-1. DOC Antidumping Investigations against Imports from China, 1980-2014[64]



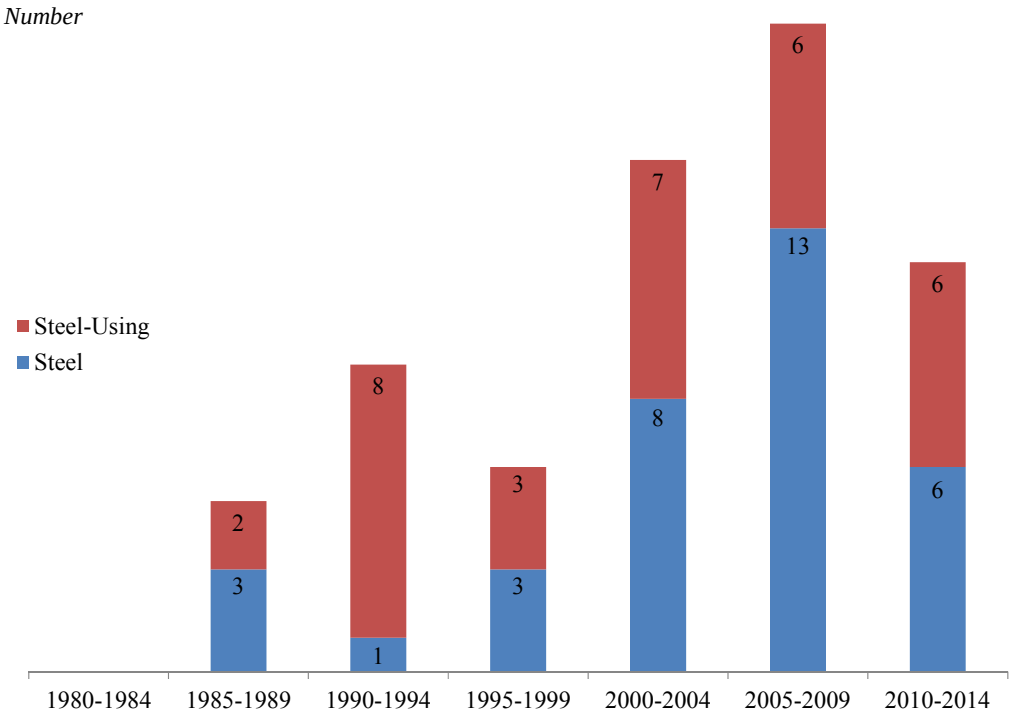
Source: DOC, International Trade Administration at http://enforcement.trade.gov/site-index.html.

Both steel and steel-using industries have filed antidumping petitions against imports from China, though not until 1985. Initial steel petitions were filed against iron castings, steel wire nails, and small diameter pipe and tube.[65] From 1980 to 1999, very few steel cases were filed against China, and steel petitions accounted for only about ten percent of petitions filed against China relative to steel using and other industries. That changed in 2000. From 2000 to 2014, steel accounted for more than a quarter of antidumping initiations. This jump in petitions coincided with the start of China's policy-induced increases in steel capacity described above. Figure 2 breaks down cases between those involving steel mill products and steel using

[63] Four petitions were either not initiated by the DOC or withdrawn by the petitioner.
[64] The figure excludes filings that were either not initiated or were withdrawn.
[65] DOC, International Trade Administration at http://enforcement.trade.gov/site-index.html.

industries. The distribution over each period is evenly split between both of these industries in most periods. However, the share of cases involving steel mill products was only 11 percent during 1990-94 and 68 percent during 2005-09.

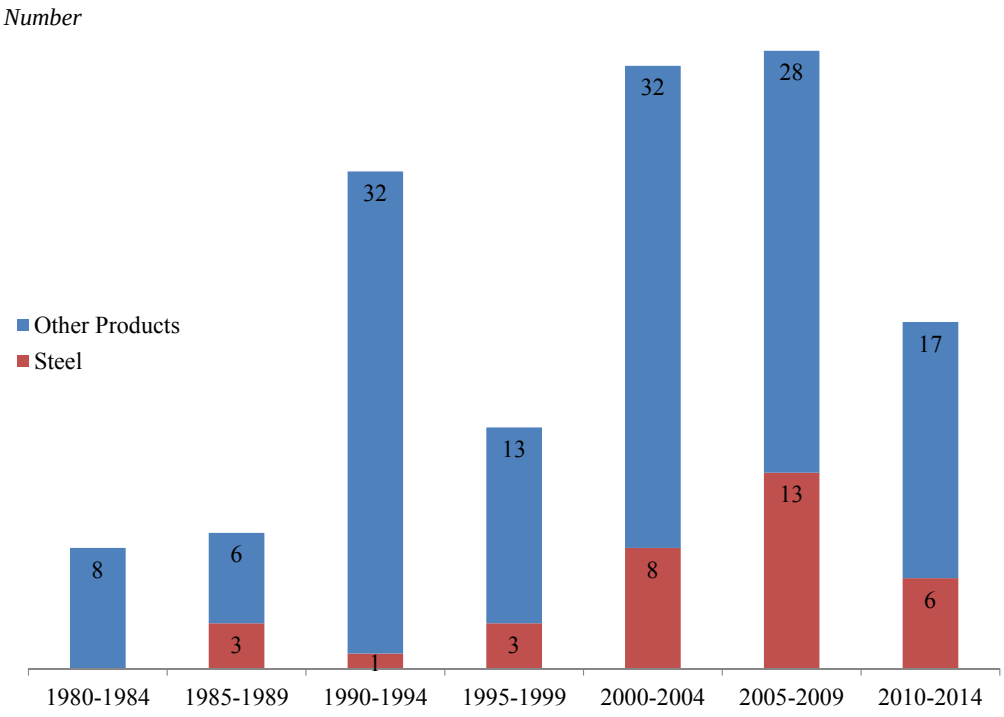
Figure V-2. DOC Antidumping Investigations against Imports from China--Steel and Steel Using Products



Source: DOC, International Trade Administration at http://enforcement.trade.gov/site-index.html.

Figure 3 compares the number of cases involving steel mill products with the number of cases in other U.S. industries. From 1980 to 2014, products from industries other than steel accounted for 20 percent of antidumping cases initiated by the Department of Commerce. The share of steel product cases over this 35 year period ranged from 0 percent during 1980 to 1984 to 33 percent during 1985 to 1989. Thus, steelmakers are not alone in turning to AD laws to cope with imports from China since the country began its pursuit of export-led growth. Other industries, including steel using industries, have frequently relied on AD laws to cope with dumped Chinese imports during the great export boom that occurred as China transitioned away from its inward looking command economy.

Figure V-3. DOC Antidumping Investigations against Imports from China--Steel Mill and Non-Steel Products



Source: DOC, International Trade Administration at http://enforcement.trade.gov/site-index.html.

China has the right to request a review of its designation as an NME for purposes of U.S. antidumping matters prior to 2017, and did request a review in 2006.[66] When considering such a request, the DOC examines whether there is a functioning market economy in the country at issue. It reflects on not only the extent to which the government has receded from state planning, but also "whether market forces are firmly rooted in the economy."[67] Critically, reforms alone are not sufficient to establish market economy status.

U.S. law lays out six criteria for the DOC to consider: currency convertibility, free bargaining for wages, foreign investment, government ownership and control of production, government control over the allocation of resources, and other appropriate factors.[68]

The DOC announced in May 2006 that it had denied the GOC's request because, "market forces in China are not yet sufficiently developed to permit the use of prices and costs in that country

[66] DOC, International Trade Administration. "Fact Sheet: The People's Republic of China's Request for Review of Non-Market Economy Status." (May 15, 2006).
[67] *Id.*
[68] *Id.*

for purposes of the Department's dumping analysis." The DOC released its supporting memorandum in August 2006.[69]

Table V-1. DOC Analysis of Market Economy Criteria for China (2006)

Criteria	DOC Assessment
Currency convertibility	The *renminbi* is not completely insulated from market forces but reforms undertaken thus far do not ensure the *renminbi's* value is market based.
Free bargaining of wages	Wages are negotiated, not set by the GOC. But a number of institutional and administrative constraints (e.g., the lack of independent unions, prohibition on the right to strike, restrictions on labor mobility) limit the influence of market forces on wage formation.
Foreign investment	Despite being open to foreign investment, the GOC continues to guide FDI towards favored export-oriented industries and specific regions, shield certain domestic firms from competition, and rely on industry-specific FDI rules and regulations.
Government ownership and control of production	Despite receding from direct control of enterprises, the GOC intends to maintain and bolster state control in certain "core" industries. Also, property rights remain "poorly defined and weakly enforced."
Control over the allocation of resources	Despite some favorable trends, the GOC "remains deeply entrenched in resource allocation." The underperforming SOE sector still accounts for a disproportionate share of bank lending.
Other factors	China's trade liberalization and bilateral investment agreements are weighed favorably. However, the GOC "has implemented a legal system that preserves privileged positions for the CCP and the state-owned sector," and faces a myriad of challenges in the areas of corporate governance, shareholder rights, accounting standards that will protect private property rights and increase transparency, control over information, intellectual property rights, an independent judiciary, and corruption.

Source: DOC, International Trade Administration, Memorandum To David M. Spooner on Antidumping Duty Investigation of Certain Lined Paper Products from the People's Republic of China ("China")-China's status as a non-market economy ("NME"), (August 30, 2006).

Were the DOC to analyze China's status today, it would likely reach the same overall conclusion; though China is closer to market economy status today than it was in 2006. Despite improvements in the areas of currency convertibility and fighting corruption, China remains on the wrong side of market economy status. China has made progress toward convertibility, but the *renminbi's* exchange value is not determined fully by market forces, a point driven home by the

[69] DOC, ITA. Memorandum on Antidumping Duty Investigation of Certain Lined Paper Products from the People's Republic of China ("China")-China's status as a non-market economy ("NME"). (August 30, 2006) at 2-4 and 78-79.

Yuan's devaluation in August 2015.[70] Institutional constraints continue to hamper the free bargaining of wages, despite the fact that wages have been rising in China in recent years. The government continues to play a role in limiting foreign investment, including in the steel sector, and continues to play an outsized ownership role in certain sectors, including steel.[71] Regarding the allocation of resources, even China's leadership admits that the China has a way to go. During the Chinese Communist Party's ("CCP") third plenum in November 2013, the Party's communique' said, "The focus of the restructuring of the economic system…is to allow the market [forces] to play a 'decisive role' in the allocation of resources."[72] Although this formulation is an improvement relative to previous CCP pronouncements, it confirms that market forces do not yet play a decisive role in resource allocation and that China foresees that non-market forces will continue to play some role in resource allocation even after the role of market forces becomes decisive. Indeed, the third plenum also pledged to uphold and strengthen the economic role of the state.[73] China is also wanting in several other areas identified by the DOC: corporate governance, shareholder rights, accounting standards that will protect private property rights and increase transparency, control over information, intellectual property rights, and an independent judiciary. Events in China during the summer of 2015 underscore the extent to which China's government is willing to intervene when markets do not produce desirable outcomes.[74]

Although China is no longer a command economy, it is not yet a full-fledged market economy as described above in Chapter III. The vestiges of China's past are visible in many aspects of its economic policymaking. The GOC continues to set goals for many industries and to actively pursue those goals through SOEs and by distorting incentives faced by many producers.

The GOC's interference in the marketplace is very evident in steel. Output in the steel industry is dominated by SOEs that for institutional reasons are driven by objectives other than profit maximization. SOE steel producers also benefit from subsidies, preferential access to financing from state-owned banks, and artificially low input costs. Although not owned by the government,

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[70] Pete Sweeney and Lu Jianxin. "China lets yuan fall further, fuels fears of 'currency war'." *Reuters.* (August 12, 2015).

[71] As this paper was being written, China's government was considering plans to end or modify its restrictions on foreign investment in the steel industry.

[72] Cathy Huang, "Party's third plenum pledges 'decisive role for markets in China's economy," *South China Morning Post*. (November 12, 2013).

[73] Adam S. Hersch. *Assessing China's Economic Reform Agenda*. Washington, DC: Center for American Progress (May 1, 2014) at 1.

[74] Stunned by a significant decline in share prices, the Chinese government attempted to halt the slide by purchasing stocks with central bank funds and ordering SOEs to buy back shares. In subsequent weeks, the government elicited a "confession" from a financial journalist, investigated executives at securities firms, and forced brokerages to contribute funds to stabilize equities. Edward Wong, Neil Gough, and Alexandra Stevenson. "China's Response to Stock Plunge Rattles Traders." *The New York Times*. (September 9, 2015).

non-state firms also face many of the distortions that reduce costs for SOEs, and tend to follow the GOC's plans. As a result of this environment, the Chinese steel industry has been plagued by excess capacity for a number of years.

Under these circumstances, it would be extremely risky for the U.S. government to confer market economy treatment to China. As a major user of antidumping laws against China, the steel industry would be one of the most directly affected industries. But other industries and the U.S. economy would be affected as well.

C. The impact of China's NME behaviors on the U.S. Economy

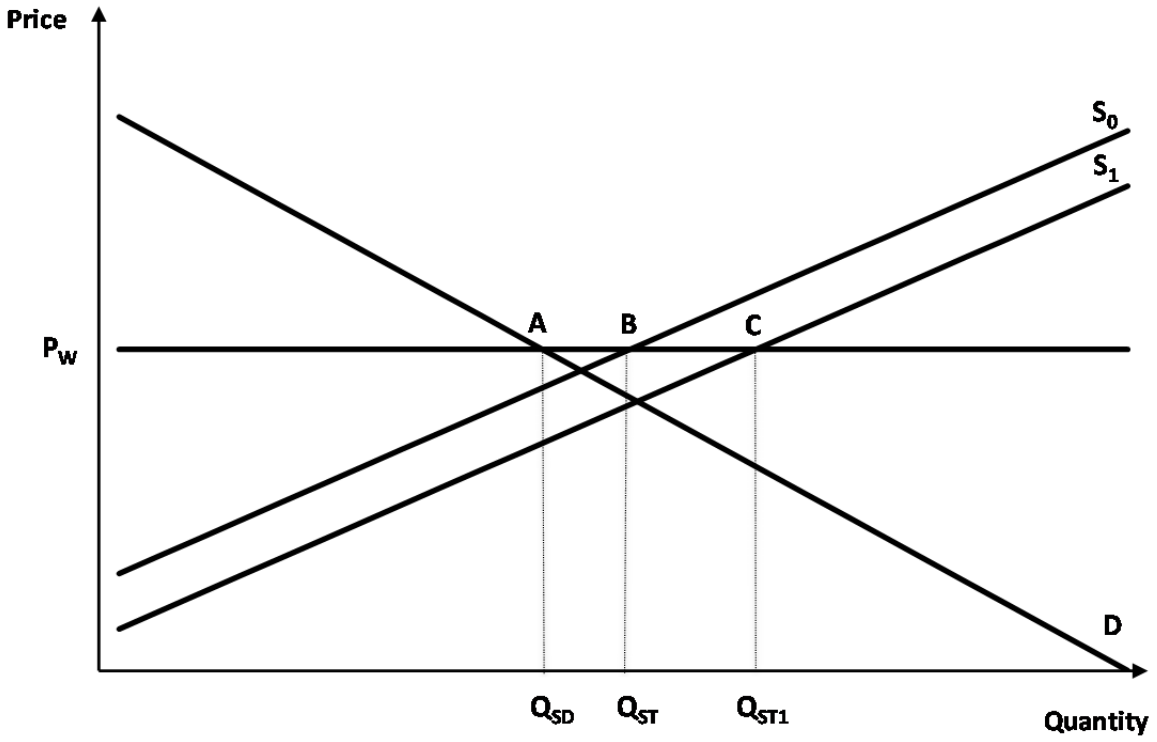
Because of the size of China's economy, any market distortions in that country can have significant effects on U.S. businesses and workers. This section describes how China's policies affect its domestic economy and how these effects can translate into lost jobs and lost profits in the United States in the short run, and influence U.S. economic structure in the medium-to-long run.

1. The big picture -- economic analysis of China's propensity to dump

As described above, Chinese policies influence the supply and demand for Chinese steel and therefore interfere with Chinese steel prices. For products that are deemed important for China's industrial development, these policies frequently lead to excess capacity in the industry producing the favored product, which in turn leads to rapid increases in exports. The GOC then facilitates exports of steel and other products through a variety of measures, such as export loans, currency manipulation, aid projects that utilize Chinese materials, and targeted rebates of export taxes. In this way, the effects of China's interventionist policies are transmitted to abroad.

a) Economic framework of analysis

Prices of the most basic inputs and factors of production in China are distorted by a variety of practices that tend to reduce the cost of production in China. Economic theory is straightforward in predicting that lower input costs, all other things equal, lead to higher export levels at the existing world price. The figure below shows China's domestic market at equilibrium. At the world price P_W, Chinese producers would supply volume Q_{ST} (the total quantity supplied) at price P_W. Q_{SD} (the total quantity demanded in China) is sold on the domestic market and Q_{ST} minus Q_{SD} is exported. However, due to a variety of market distortions, the supply curve of Chinese firms is at S_1. At price P_W, equilibrium is at C and exports are Q_{ST1} - Q_{SD}. Thus, under the assumption of China being a price taker, lower input prices in China lead to increased competitiveness and increasing exports.



But China is so large and its footprint in export markets so prominent that it often is not a price taker, but a price maker. This happens because, as described above, Chinese policies not only result in artificially lower input prices, but also the creation of capacity that is not only well in excess of what can be consumed domestically, but also large enough to reduce price levels on a global basis. In industries where China is not a price taker, its expanding capacity has other effects on the global economy. World prices decline. Market shares change, with Chinese production gaining share at the expense of other countries, both inside and outside of China. Lower prices that arise as imports from China flood the market lead to lower domestic capacity utilization, temporary or permanent shutdowns of production facilities, and/or worker-hour reductions or layoffs. Over time, investment in the industry slows or declines in other countries. In the new equilibrium, China has a higher market share and a greater investment share in the industry while other countries see their market shares at home and abroad and their shares of global investments shrink in that industry.

What makes this scenario even more dangerous to open markets such as the United States is that China's policy-directed growth is prone to the creation of excess capacity and potentially large imbalances between supply and demand. Investment decisions, particularly those of SOEs but also those of private-sector companies following China's plans, are less sensitive to market signals and are more likely to go forward than investments by firms in market-economies. By the time China's planners realize that their plans have worked too well, it is usually too late for them to do anything about it. Excess capacity becomes structural, domestic prices decline relative to

world prices, and China's producers become increasingly reliant on export markets and government schemes to increase domestic consumption. Moreover, there is a bias in China against allowing locally-owned producers, especially SOEs, to close production facilities. Instead, the local government often supports some sort of restructuring that puts the low value assets and bad debts under a legacy enterprise while the good assets and employees are transferred to a new enterprise, frequently state-owned, that can operate as if nothing has happened. Thus, the failure of an enterprise in China, especially in the steel industry, does not lead to a reduction in capacity like those that occurred in the United States at integrated mills due to the rise of minimills using electric arc furnace technology. China has promised reductions of capacity in the past, but without changing the underlying policies that have supported capacity growth, steel capacity in China has continued to expand.

Based on this causal chain, one would expect to see the following outcomes based on industrial policies that aim to increase China's international competitiveness in a particular product. First, using the steel industry as an example, there would be capacity increases and relative cost reductions in China. Second, as a result, steel prices in China would be persistently lower than steel produced in other countries. Third, one would expect Chinese-made steel to replace steel imports (a process known as import substitution) and, as capacity and production expand, China would transform from a net importer to a net exporter. Fourth, China's steel industry would grow larger relative to the steel industries in other countries. Fifth, China's trading partners would experience import surges from time to time in various product categories as Chinese producers deal with inadequate demand in China or demand shocks occur in one of China's export markets.

In fact, each of these outcomes has transpired in multiple steel product segments, as well as in other product segments.

b) Trade distortions: dumping

Thus, the Chinese government has heavily influenced the supply-side and the demand side of the market for Chinese-produced steel. These efforts created a persistent imbalance between supply and demand, resulting in consistently low steel prices in China and excess supplies that have led to export surges from China. This pattern is exactly what market economy governments feared when faced with NMEs in the 1970s, and precisely why the NME methodology was developed in the first place.

Because steel prices in China have been very low in recent years, Chinese producers with sufficient quality have had an incentive to export their excess production. But as there are many steel producers in China, there is competition among Chinese producers to sell at the higher export price. This eventually drives down the price of Chinese exports to low levels, leading to spasms of exports in certain products at the artificially low China price. For importing countries such as the United States, there are large increases in imports from China at prices substantially lower than the prevailing market price. Domestic producers and importers selling steel from other countries lose sales to the Chinese product and respond by reducing their prices. At the

new equilibrium, prices, shipments, market share, profits, and employment of the import-competing industry are lower, and the Chinese market share is higher.

2. Direct and indirect effects

The sharp increase in policy-driven exports of steel, solar panels, and other products from China do more than just increase U.S. imports. If there is no competing U.S. industry, then the gains to the U.S. economy are straight-forward. Consumers and/or producers that had paid more for a good imported from another country pay less due to Chinese subsidies and dumping, and there is an increase in economic welfare. When there is a competing U.S. industry, the economics become more complex, and depend critically on assumptions regarding how quickly inputs such as labor that are released from the U.S. industry are utilized by other firms. The comparative-static analytical framework assumes such losses away. All production inputs, including labor, are simply absorbed by other industries, and any lost profits by the injured import-competing industry are more than offset by increases in consumer surplus arising from lower prices and increased quantities.

The empirical support for the assumption of frictionless job loss is weak, and there are many analyses inside and outside the trade area suggesting there are a wide variety of direct and indirect losses.

There are two types of losses arising from any type of job displacement: the economic cost arising while a worker is unemployed and earnings losses those arising once displaced workers are re-employed.

An analysis of the impact of asbestos related bankruptcies on workers described the losses associated with temporary unemployment this way:

> "{t}he structural and frictional unemployment associated with the bankruptcies represents a lost opportunity. That is, to the extent that the movement of the displaced workers to new jobs produces a temporary increase in the unemployment rate that would not have otherwise occurred, the production of goods and services lost during the transition represents a true economic cost."[75]

Another source of economic loss occurs arises because workers displaced by trade or other reasons tend to experience declines in earning once they are reemployed. Princeton Henry S. Farber has documented his phenomenon in his studies of Bureau of Labor Statistics' Displaced

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[75] Joseph E. Stiglitz, Jonathan M. Orszag, and Peter R. Orszag. *The Impact of Asbestos Liabilities on Workers in Bankrupt Firms*. Sebago Associates (December 2002) at 28.

Workers Survey.[76] In his study of U.S. displaced workers over the 1981-to-1999 period, Farber concluded:

> "The costs of job loss are substantial. Employment probabilities are reduced substantially. There is an increased probability of working part time, yielding lower earnings both through shorter hours and lower wage rates. These costs are larger for those workers with less education. And even those re-employed full time suffer substantial earnings losses on average, regardless of education level."[77]

While neither of these analyses considers job losses due to trade or job losses resulting from unfair trade with China, they do suggest that methodologies that assume no adverse job effects from trade are unreliable. This is not to say that other industries benefitting from dumped imports never hire more workers because they have access to dumped imports. Some do.[78] But in cases where the product in question is price inelastic, which is typically the case with steel, the benefit of the dumped import is largely due to the lower price.[79]

Many previous analyses tended to attribute manufacturing job losses largely to technological developments and factors other than trade.[80] However, recent studies have found statistically and economically significant links between the increased imports and adverse job effects. For example, Autor, Dorn and Hanson found that rising Chinese import competition from 1990 to 2007 led to decreased manufacturing employment and reduced wages outside of the manufacturing sector.[81] They also found that adverse trade shocks at the local level were absorbed by government transfer payments or welfare programs.[82] The consequent local effects

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[76] See, for example, Henry S. Farber. "Job Loss and the Decline in Job Security in the United States," in Katharine G. Abraham, James R. Spletzer, and Michael Harper, *eds. Labor in the New Economy*. (University of Chicago press, 2010).

[77] Henry S. Farber. "Job Loss in the United States, 1981-1999." Princeton University Industrial Relations Section Working Paper #453 (June 2001) at 31. Farber notes that some of the displacement costs decline over time, but that "there is little evidence that the full-time earnings penalty for displacement narrows with time since displacement. And the cost due to foregone earnings growth is unlikely to be recouped."

[78] The dumped prices for crystalline photovoltaic solar panels and modules may have led to job creation among installers of solar systems.

[79] For example, because the cost of steel rebar is a very low percentage of the total cost in projects in which rebar is used, there is very little, if any, increase in rebar purchases due to the decline in price.

[80] See, for example, Martin Neil Bailey and Robert Z. Lawrence. "What Happened to the Great U.S. Job Machine? The Role of Trade and Electronic Offshoring." *Brookings Papers on Economic Activity*, 2:2004.

[81] David H. Autor, David Dorn, and Gordon H. Hanson. "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." American Economic Review 2013, 103(6) at 2147. "The results of this section demonstrate that an increase in the exposure of local US labor markets to Chinese imports stemming from rising Chinese comparative advantage leads to a significant decline in employment and wages in local markets."

[82] Autor, Dorn, and Hanson at 2149.

of import competition on household incomes are "statistically significant and economically large."[83]

In addition to the direct losses in employment are indirect losses that arise due to economic linkages between sectors. Based on input-output coefficients that capture these linkages, Acemoglu, Autor, Dorn, Hanson, and Price found that increased Chinese import penetration from 1999 to 2011 were associated with a decline of 560,000 direct manufacturing jobs, 425,000 indirect job losses in supplier industries, and an additional one million lost jobs in the overall economy, for a total loss of two million jobs.[84]

Another factor that often flies under the radar is that China's rapid export expansion creates dislocation in other countries as well. This dislocation has effects similar to those in the United States. For example, a study of the South African economy found that rising Chinese penetration of the South African market displaced imports from other countries as well as local production, with particularly adverse effects in labor-intensive industries.[85] A separate study of China's impact on South Africa found that all types of South African exports lost ground to China, particularly in African markets, though losses were offset by the effect of rising commodity prices created by China's economic growth.[86]

To the extent that this commodity price inflation was driven by Chinese policies that artificially increased demand for commodities, those policies inflated costs for steel producers in other countries at the same time that prices were depressed by imports of low-priced Chinese steel. This "cost-price" squeeze has depressed profitability among U.S. steel producers in recent years, preventing them benefitting fully from the increase in steel demand that has occurred during the economic recovery following the great recession.

Gomory and Baumol have identified other potential economic losses arising from trade that are relevant to the U.S.-China economic relationship. They observe that while a developed country can benefit if an underdeveloped trading partner acquires new industries, those benefits may stop once the underdeveloped country reaches a level that allows it to play a greater role in global

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[83] Autor, Dorn, and Hanson at 2151.
[84] Daron Acemoglu, David Autor, David Dorn, Gordon H. Hanson, Brendan Price. "The Rise of China and the future of US manufacturing" (September 28, 2014) (http://www.voxeu.org/article/rise-china-and-future-us-manufacturing).
[85] Lawrence Edwards and Rhys Jenkins. "The impact of Chinese import penetration on the South African manufacturing sector." Southern Africa Labour and Development Research Unit Working Paper Number 102 (July 2013) at 15-16, 19, 21. Econometric estimates found that a one percent increase in import penetration was associated with a 1.44 percent decline in industry employment. Losses were in part offset by lower costs input costs.
[86] Lawrence Edwards and Rhys Jenkins. "Is China "crowding out" South African exports of manufactures." Southern Africa Labour and Development Research Unit Working Paper Number 107 (August 2013)

trade.[87] As Gomory explained in testimony before the U.S.-China Economic and Security Commission, their analysis "corresponds to the intuitive notion that we do well when we lose low-wage jobs and not well when we start losing high-wage and high-tech jobs."[88] In his view, China's government-induced market distortions are creating in China "facilities that access and practice the most current methodology and R&D. Often, the output of these facilities goes to the U.S. market. There, with the effect of subsidy, low labor costs, or up-to-date methodology – or all three – they can often outcompete U.S. firms actually working in the United States."[89]

D. Case studies

This section reviews how the distorted markets created by the Chinese industrial policies have affected Chinese capacity, exports, and U.S. imports in the steel and solar panel industries.

1. The case of steel

Government policies in the steel industry have had the goals of increasing capacity, increasing exports and reducing imports, moving the Chinese industry up the product value chain, upgrading production technology, and industry consolidation. Policy goals have varied over time, and the plans have not always been successful.

But one area where planners succeeded was in generating capacity expansion in the steel industry. Driven by policy pronouncements and patterns of subsidization that benefitted expansion in the steel industry, both SOEs and non-state producers invested heavily in expanding capacity. This led to a rapid increase in exports facilitated by a sharp decline in the relative price of Chinese steel.

Chinese data are notoriously unreliable and maintaining accurate data on steel capacity in a country as large as China is no easy task. The Steel Committee of the Organization for Economic Cooperation and Development (OECD) collects detailed capacity data for OECD countries and prepares occasional studies of steelmaking capacity in Non-OECD countries. Those data show Chinese steel capacity rising a more-than-respectable 8.6 percent annually from 1989 to 2002, and then rising sharply thereafter, reaching an estimated 1001 MTs in 2014 (est.). From 2002 to 2014 the growth rate was 14.5 percent per year. China's capacity expansion continued unabated during the Great Recession, as shown in the figure below, despite the sharp slowdown in global demand and unfavorable price signals.

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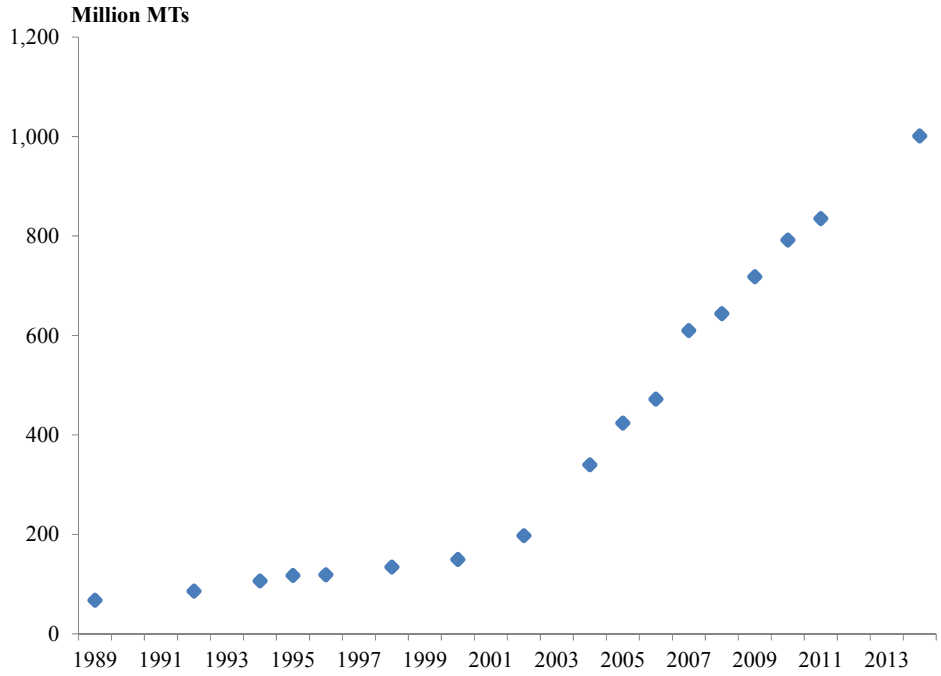
[87] Raph E. Gomory and William J. Baumol. *Global Trade and Conflicting National Interests.* Cambridge: MIT Press (2000) at 56.
[88] Testimony of Ralph E. Gomory to the U.S. Economic and Security Review Commission (May 9, 2009).
[89] *Id.*

Figure V-4. Crude Steelmaking Capacity in China, 1989-2014

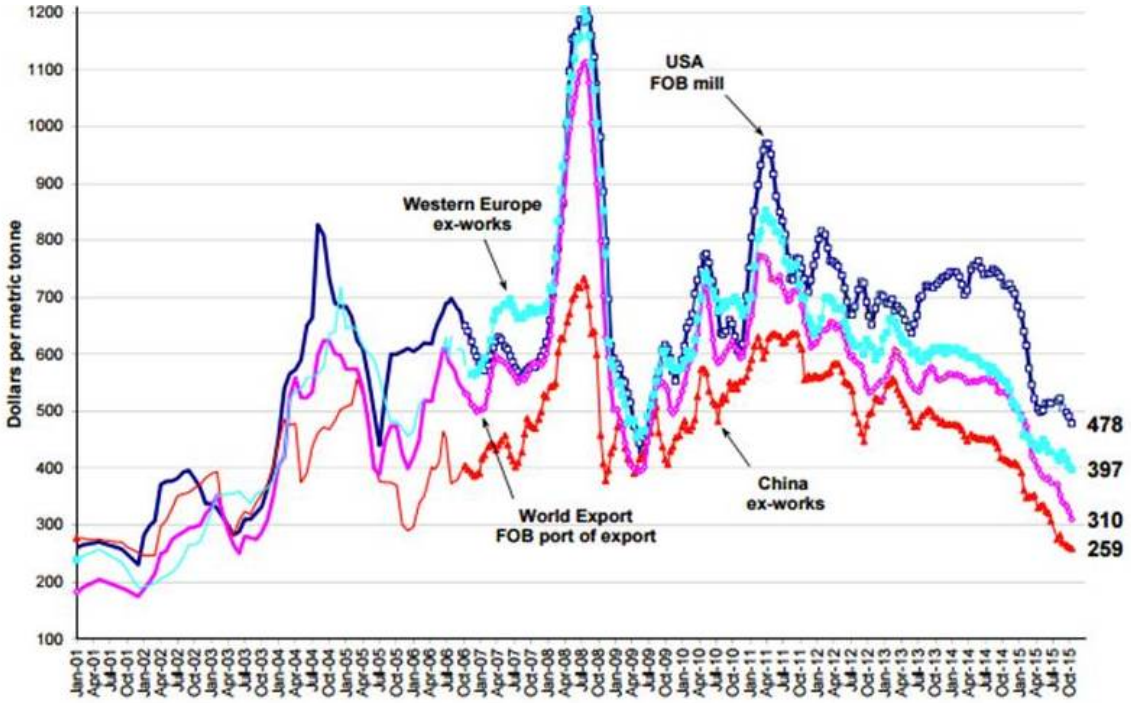


*2014 Data are estimated.
Source: OECD, Developments in Steelmaking Capacity in Non-OECD Countries, 2014 and earlier issues.

The rapid increase in China's capacity resulted in increased steel production in China, which soon became the world's largest producer of steel, accounting for nearly half of global output. A good portion of this increase in capacity could be used to supply China's growing appetite for steel as it expanded its infrastructure and multi-unit housing, the Chinese market became oversupplied and has remained that way for more than a decade. As a result, prices in China have been depressed

The figure below demonstrates that the domestic price of steel in China was comparable to market prices in the United States and Europe. That changed once China went on a policy- and subsidy-fueled capacity expansion. Since 2004, Chinese steel prices have been substantially lower than prices in the United States and Europe. Put differently, there has been a sustained decline in the relative price of Chinese steel coinciding with the large increase in Chinese steelmaking capacity.

Figure V-5. USA, China, Western Europe, and World Export Price for Hot-Rolled Steel Band



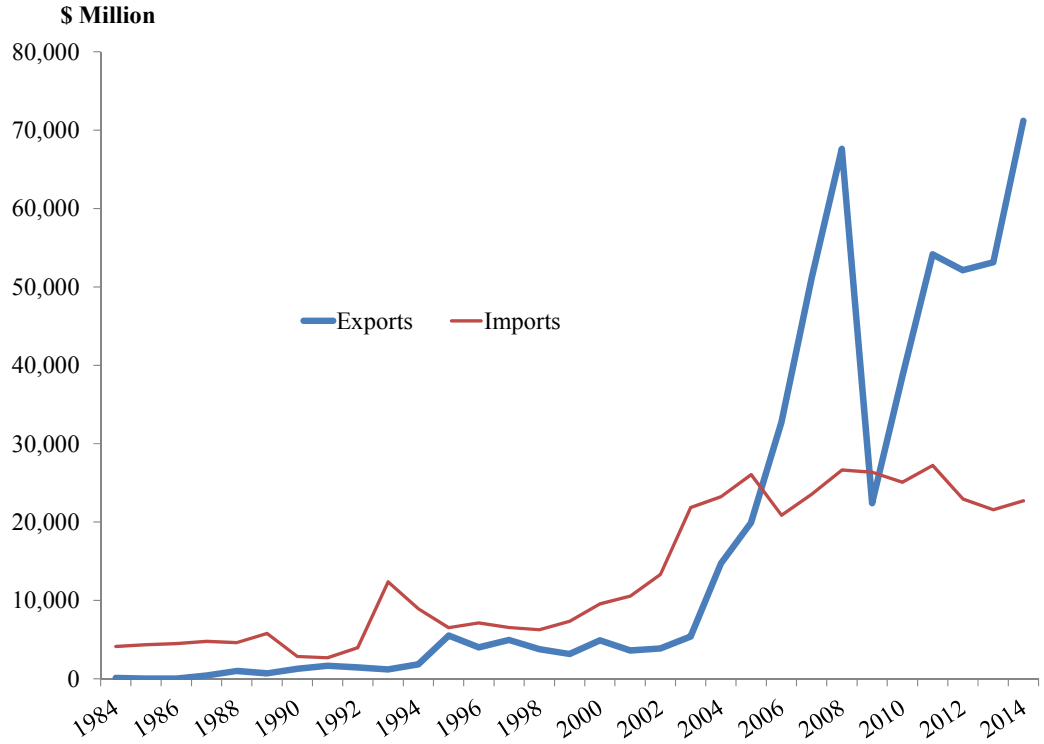
Sources: SteelBenchmarker [TM] (World Steel Dynamics' Price Track data, Jan. 2001-March 2006; SteelBenchmarker data begins April 2006).

China's industrial policies for favored industries have generally followed a similar path. Initially, China's government incentivizes domestic purchasers and producers to replace imports with domestically produced goods. Typically, industry-specific industrial plans will combine several types of policies involving local government, government-owned policy banks that provide low interest rate loans to firms in the favored industry, government-owned "commercial" banks that also provide loans, and tax policies that provide benefits to the state-owned and private firms that make investments or purchases to carry out the government's plans. These tax benefits might include tax holidays for investments by foreign-invested firms, including the foreign subsidiaries of Chinese firms, or tax credits that rewarded a firm for purchasing a domestically produced good instead of an imported good.

In several industries, these comprehensive policies were extremely successful and converted China from a net importer to the world's dominant exporter and in producer. Steel is one such industry. According to the United Nations COMTRADE Database, Chinese steel trade was consistently in deficit from 1984 to 2005 before a sharp increase in exports in 2006 that coincided with a leveling off of imports. The magnitude of this increase is even more remarkable in light of the fact that Chinese steel exports were flat from 1995 to 2003, fluctuating in a narrow range of $3.2 billion to $5.5 billion. But beginning in 2004, China's annual exports increased by $9.3 billion, $5.2 billion, $12.8 billion, $18.4 billion, and $16.4 billion, respectively, to reach a

level more than 15 times greater than the 1995-to-2003 average. At the same time, the value of China's steel imports from the world leveled off, fluctuating in the range of $20.9 billion to $27.2 million even though China's economy expanded at a much faster clip than the economies of the rest of the world.

Figure V-6. China's Trade in Steel Products



*Based on SITC Rev. 1, Division 67.
Source: UN COMTRADE Database.

Clearly, on an aggregate basis Chinese policies succeeded in transforming China to a major net exporter of steel products.

The rapid rise in exports took place in the context of a historic increase in steel China's steel production. From 2000 to 2013, China's output of crude steel expanded from 128.5 million MTs, or 15.1 percent of world output, to 822 million MTs, 49.8 percent of world output. Although China's steel output was growing at a rapid clip, 6.4 percent, until 2000, its compound average annual growth rate from 2000 to 2013 expanded by a breathtaking 15.3 percent per year, as shown in the figure below. To put that into context, the additions to Chinese capacity every two years during this period exceeded typical production by the *entire U.S. steel industry*. While China's domestic economy was able to absorb this increase during 2000 to 2003, the continued increase in output could only be accomplished by shipping Chinese steel to foreign markets, which explains the increase in exports shown in the prior figure. It is also revealing that in 2009, when global steel output and China's exports declined due to the Great Recession, the growth

path of China's steel shipments continued its upward trajectory as though nothing had happened. This was accomplished through herculean efforts to create demand for steel in China, largely through infrastructure and large construction projects, and abroad through Chinese funded projects undertaken by SOEs.

2. Oil country tubular goods (OCTG)

As the name suggests, OCTG are welded or seamless pipes and tubes that go inside an oil well. The product category includes casing to keep the well hole from collapsing, tubing that goes inside the casing, and drill pipe. Demand for OCTG is driven by demand for oil and gas and is cyclical.

The expansion of China's OCTG production was policy-driven and follows a familiar path. Several steel policy documents identified OCTG as a product that Chinese steelmakers should develop, including the *Catalogue of Major Industries, Products and Technologies Encouraged for Development in China*; *China's Steel Industry Development Policy of 2005*; the aforementioned *Directory Catalogue on Readjustment of Industrial Structure*; and China's *Foreign Investment Catalogue*.[90] The status of OCTG as a favored product was further enhanced by its relevance to the petroleum industry, another focus of China's planners. Thus, OCTG was singled out in China's national Eight, Ninth, Tenth, and Eleventh Five Year Plans and included in many provincial planning documents as well.

The government's identification of OCTG as a favored product segment meant there were substantial financial benefits for enterprises that commenced or expanded OCTG production. The Department of Commerce's subsidy investigation found subsidy rates ranging from 10.36 percent to 15.78 percent ad valorem for individual enterprises based on the eleven subsidy programs.[91] These programs included policy and export loans at below market rates; provision of certain production inputs at below market prices; various grants from national and local entities, including the State Key Technology Fund; various programs that reduced income taxes to foreign-invested enterprises;[92] a program that reduced income taxes for domestic enterprises that

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[90] For a summary of China's OCTG-specific policies, see *Certain Oil Country Tubular Good from the People's Republic of China: Petition for the Imposition of Antidumping and Countervailing Duties Pursuant to Sections 701 and 731 of the Tariff Act of 1930, As Amended, Vol. III.* (April 8, 2009) at http://enforcement.trade.gov/download/factsheets/factsheet-prc-octg-cvd-final-112409.pdf.

[91] Department of Commerce, International Trade Administration. "Fact Sheet: Commerce Finds Subsidization of Certain Oil Country Tubular Goods from the People's Republic of China." (November 24, 2009).

[92] Foreign-invested firms benefitting from such programs are frequently Chinese-owned entities that established subsidiaries in Hong Kong or "haven" economies in the Caribbean, and use those entities to invest in Chinese production facilities. This phenomenon is known as "round-tripping."

purchased domestically produced equipment; and a program to forgive certain loans and interest to SOEs.[93]

The government's imprimatur and subsidies resulted in rapid capacity expansion in China and rapid increases in exports of OCTG particularly to the United States. The U.S. industry filed antidumping and countervailing duty petitions against OCTG casing and tube imports from China in April 2009. Although not all Chinese producers responded to the Commission's questionnaire, those that did reported increasing capacity by 1.5 million short tons from 2006 to 2008, an increase of 26 percent. This increase in output was export oriented; home market shipments increased by only 0.1 million tons, while exports to the United States increased by 1.0 million short tons.[94] Put differently, China's policies succeeded in expanding the country's capacity but new capacity was export oriented and resulted in a large increase in exports to the United States.

The DOC found Chinese producers were dumping OCTG in the U.S. market at margins of approximately 30 percent.[95] The Commission found that OCTG imports from China threatened the U.S. industry with injury. From 2006 to 2008, the Commission's data showed that imports from China tripled, as apparent in the figure below, and that China's market share in the United States increased from 15.3 percent in 2006, to 32.7 percent in 2008, and to 37 percent during January-to-September 2009.[96] The Commission also found that the Chinese OCTG undersold U.S. OCTG by a significant amount and that importers of China's OCTG used underselling to increase market share in the United States.[97] Although U.S. demand for OCTG declined sharply in September 2008, the monthly volume of OCTG imports from China remained high through May 2009.[98] As a result, ending inventories of purchasers and importers ballooned, setting the stage for a continuation of low OCTG prices.

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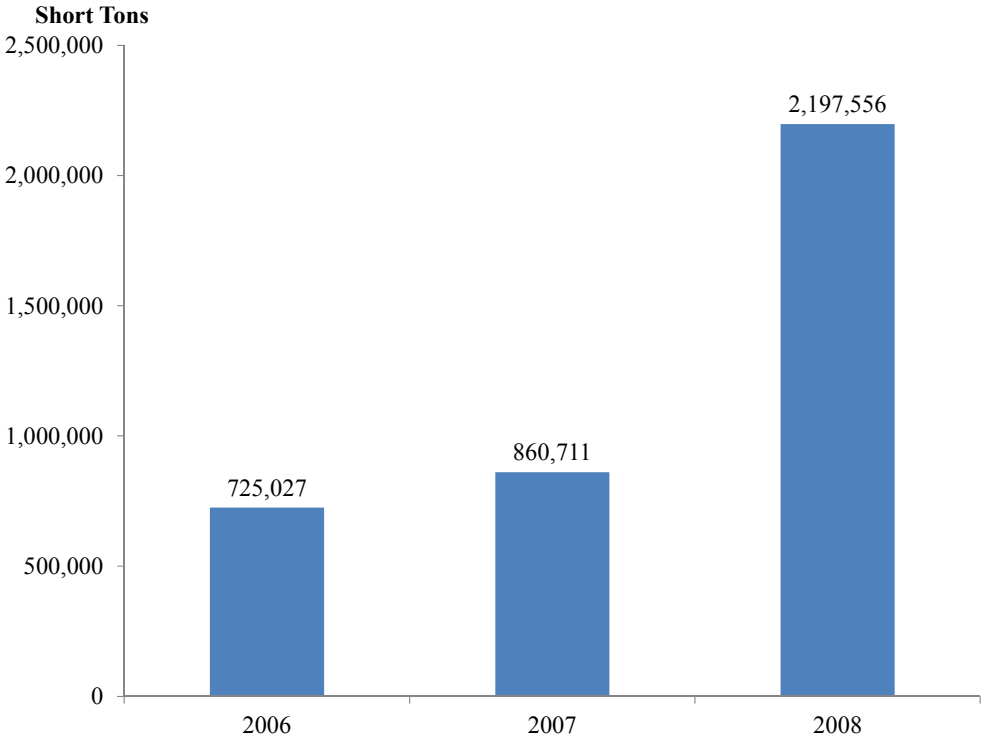
[93] DOC, International Trade Administration. Issues and Decision Memorandum for the Final Determination in the Countervailing Duty Investigation of Certain Oil Country Tubular Goods ("OCTG") from the People's Republic of China. (November 23, 2009) at http://enforcement.trade.gov/frn/summary/prc/E9-28779-1.pdf.
[94] USITC. *Certain Oil Country Tubular Goods from China*. Inv. No. 701-TA-463 (Final). Pub. 4124. (Hereafter, "OCTG China") (January 2010) at VII-5, Table VII-4.
[95] DOC, International Trade Administration. "Fact Sheet: Commerce Finds Dumping of Oil Country Tubular Goods from the People's Republic of China." (April 9, 2010).
[96] OCTG China at 14.
[97] OCTG China at 24.
[98] OCTG China at 17.

Figure V-7. U.S. imports of OCTG from China



Source: USITC, OCTG China at VII-5.

The U.S. OCTG industry was not alone in seeking relief. The Canadian industry filed a petition in March of 2008. The EU, Russia, and Argentina also instituted investigations against Chinese OCTG during the 2008-to-2009 time frame.[99]

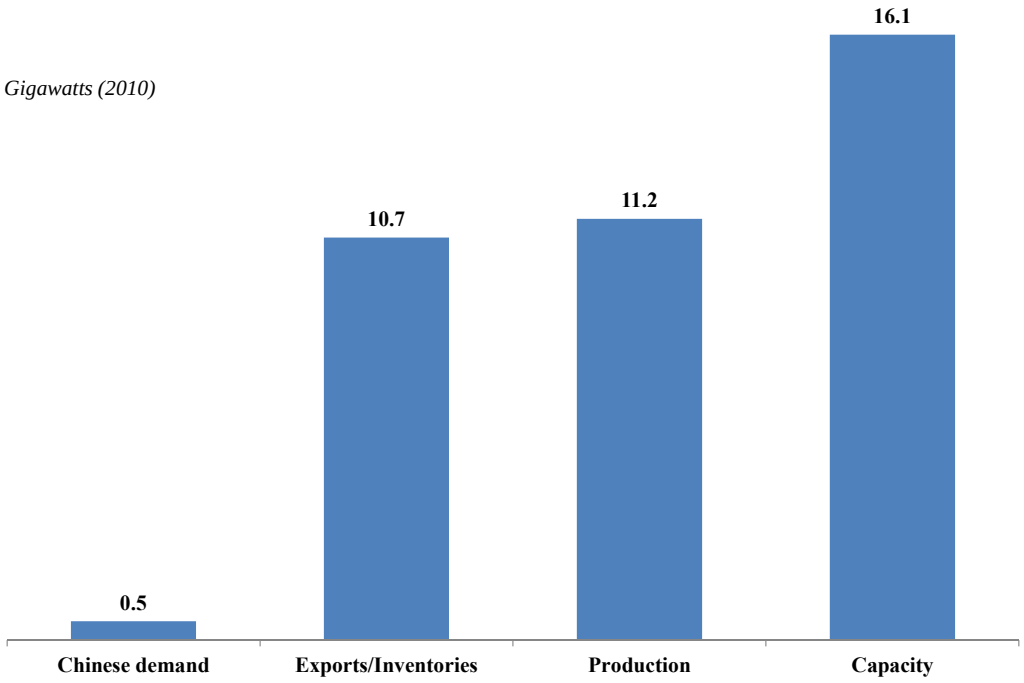
3. Solar panels and modules

Domestic industries can petition for antidumping relief if they believe that the import surge is abetted by dumping and/or subsidies. Typically, industries that believe that they are being injured by unfair trade seek assistance from specialists inside or outside the government to determine whether a petition is warranted and likely to succeed. If the unfair trade is allowed to continue, the impact on the domestic industry can be severe. A notable recent example comes from the U.S. crystalline solar photovoltaic ("CSPV") industry, which faced a number of closures due to a rapid and sustained increase in imports of CSPV panels from China, even as the U.S. demand for solar panels was rising due to federal and state policies aimed at expanding the use of solar energy.

[99] USITC, *OCTG China* at VII-7 to VII-8.

The Chinese foray into the solar industry fits the classic pattern of policy overshoot with one exception; the GOC's goals were accomplished largely with privately-owned firms in the lead. Armed with government policy support and other preferences, several companies were able to raise large sums of money in international capital markets and invest those funds into capacity expansion. China's solar capacity to produce CSPV cells and panels expanded at an exponential rate and by 2010, according to a study by Goldman Sachs, was 32 times larger than demand for solar power in China, as shown in the figure below. China quickly became home to the world's largest producers of CSPV panels, with companies like Suntech, Trina, and Yingli coming to dominate the industry within the span of a decade.

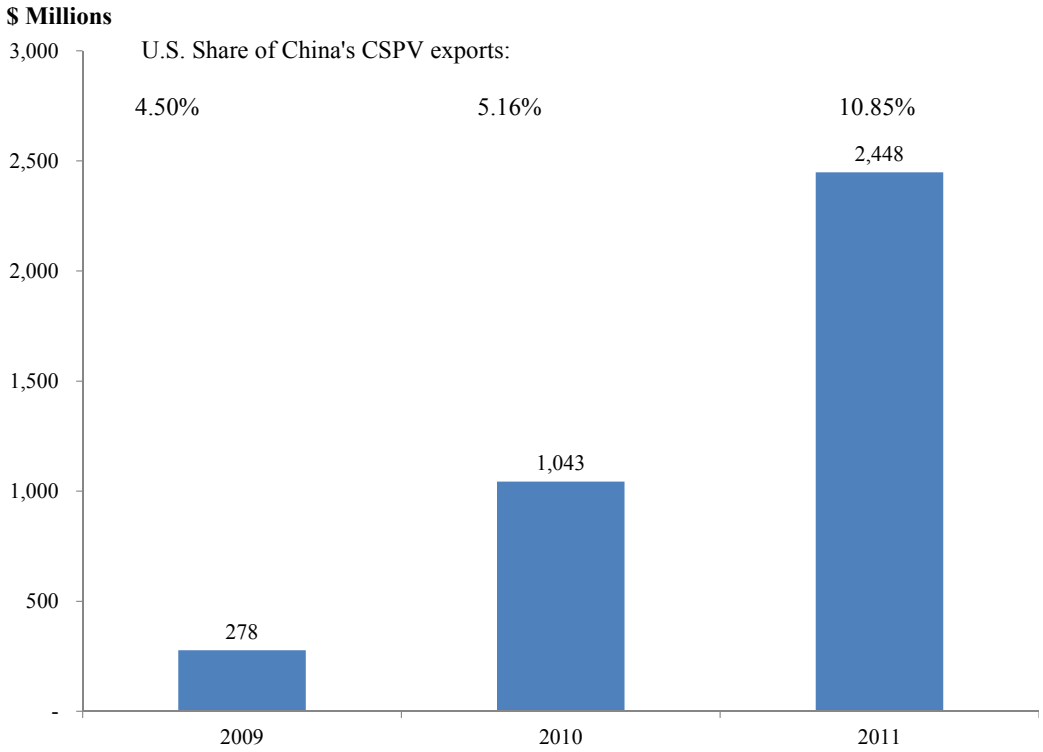
Figure V-8. Chinese Solar Panel Capacity and Its Uses



Source: Goldman Sachs Global investment Research, Global: Clean Energy: Solar (July 7, 2011) slides 15 and 28.

The rapid increase in capacity in China led to a large increase in exports to the United States. According to Chinese data, the value of Chinese exports of solar cells to the United States almost quadrupled from $277.7 million in 2009 to $1.0 billion in 2010 before more than doubling to $2.4 billion in 2010. The United States had accounted for a mere 4.5 percent of Chinese export value in 2009 accounted for 10.9 percent of value in 2011.

Figure V-9. China's Exports of CSPV Modules to the United States

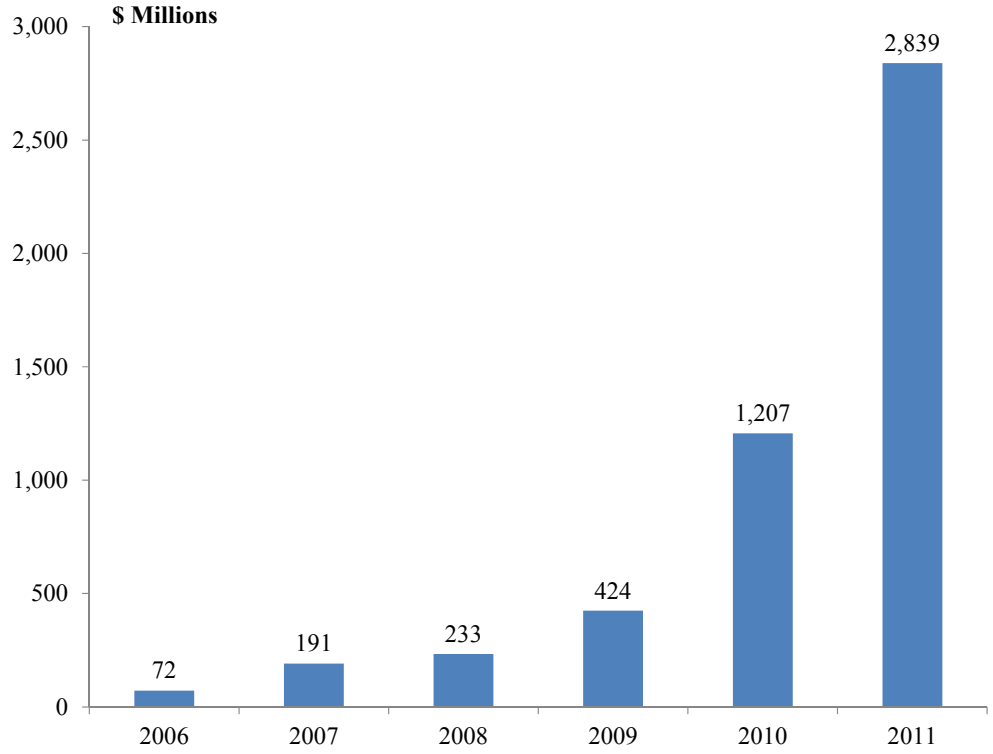


Source: GTIS Global Trade Atlas (HS 85414020).

U.S. data offer a longer timeframe of analysis and show different values than the Chinese data, but are consistent in showing that China rapidly increased its penetration of the U.S. market during 2006 to 2011. U.S. demand was expanding during that period, and imports from China would have expanded in any event. But imports from China were sold at extremely low prices and they captured market share at the expense of the U.S. industry and imports from third countries. From 2006 to 2011, U.S. imports of solar cells and modules from other countries expanded by 42.6 percent annually. Imports of CSPV from China expanded even faster, growing at a compound rate of 108.5 percent during the period.[100] China went from supplying 16.1 percent of imports by value in 2009 to accounting for 56 percent of imports in 2011. The U.S. industry—what was left of it—filed antidumping and countervailing duty petitions in November 2011.

[100] These calculations are based on U.S. import data obtained from USITC Trade Dataweb for HTS 8541406020 and HTS 8541406030.

Figure V-10. U.S. Imports of CSPV Cells and Modules from China



Source: USITC Trade Dataweb (HTS 8541406020 and HTS 8541406030).

The large capacity increases in China and subsequent export surges resulted in rapid declines in prices for solar panels in China and in the world as a whole. One-time major players in Europe, the United States, and Japan became small in comparison, and many of them went out of business.[101] EU and U.S. authorities ultimately found that Chinese firms achieved their success in the market through dumping. The Chinese firms contested the finding at the DOC, but even company officials acknowledge that Chinese market share increases were driven by selling CSPV panels below cost.[102] And though the firms managed to maintain a veneer of profitability during the antidumping investigation, the dumped prices that accelerated Chinese market share gains ultimately led to a financial morass that China's government had to clean up.[103]

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[101] Gerret Herring. "The solar cemetery." *Photon International.* (May 2010): 83-89.
[102] Keith Bradsher. "China Racing Ahead of U.S. in the Drive to Go Solar," *The New York Times* (August 4, 2015). "Shi Zhengrong, the chief executive and founder of China's biggest solar panel manufacturer, Suntech Power Holdings, said in an interview here that Suntech, to build market share, is selling solar panels on the American market for less than the cost of the materials, assembly and shipping."
[103] The Chinese government provided funding that kept many firms from failing and undertook efforts to increase usage of solar panels within China. "China Development Bank Renews Solar Support, Journal Says." *Bloomberg*

In short, the solar antidumping saga offered a vivid portrayal of how Chinese industrial policies led to capacity increases and rapidly expanding exports fueled by dumped prices. The largest U.S. producer filed an antidumping petition, and the NME methodology applied margins ranging from 18.3 percent to 29.14 percent on individual companies.[104] There is one remaining producer in the United States: SolarWorld. Suntech Power, previously the largest producer in China and the world, and its U.S. subsidiary have both sought bankruptcy protection in recent years.[105]

E. Potential impact of treating China as a market economy for NME purposes

In this section, a computable general equilibrium ("CGE") model is used to investigate potential effects on the U.S. and NAFTA economies of giving China market economy treatment for purposes of antidumping investigations before China makes sufficient progress in reforming its economy.

1. GTAP Model

The CGE modeling framework consists of a series of linked model equations that describe the economic behaviors of economic actors (e.g., how firms in an industry and consumers react to a reduction in duties) combined with a detailed database of trade, production, protection variables, and macroeconomic data that are consistent with each other and the underlying equations.[106] This class of models is widely used to analyze changes in trade and other economic policies because it facilitates analysis of policy issues on a national, multi-national, and global basis.

The model and database of the Global Trade Analysis Project ("GTAP"), housed at Purdue University, is perhaps the most widely known package used to analyze global trade issues.[107] The GTAP model and database are fully documented, publicly available, and distributed via the GTAP website.[108] The GTAP model is a multiregional, multi-sector applied general equilibrium model that enables users to conduct quantitative analysis of international economic issues in an

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News. (September 25, 2012); and "People's Daily: Government Planning 70 Billion RMB Rescue Package for the Solar Industry." Chinascope. (October 30, 2012).

[104] 77 FR 73018-73021. The PRC-wide rate was 249.96 percent.

[105] Michael Bathon. "China's Suntech Power U.S. Unit Seeks Bankruptcy Protection." *Bloomberg.com*. (January 12, 2015). "Suntech America was forced to seek bankruptcy due to 'a rapid decrease in the price of solar panels due to an expansion of Chinese solar panel manufacturing capacity,' Suntech Group Chief Restructuring Officer Robert Moon said in court filings."

[106] CGE models are also referred to as applied general equilibrium (AGE) models. The models are quantifiable (computable), treat all commodities, sectors, and production factors (general), and balance the supply of the treated commodities and production factors through the price mechanism (equilibrium).

[107] Other CGE models frequently utilize the GTAP Data Base.

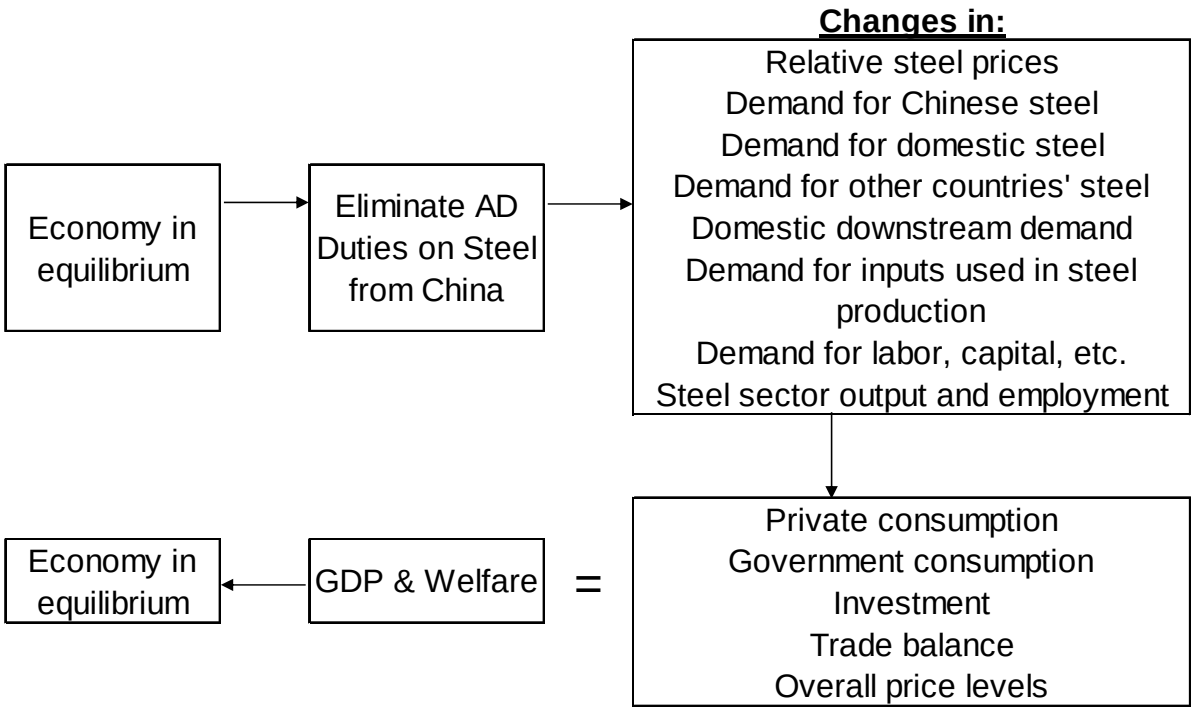
[108] The URL of the homepage is https://www.gtap.agecon.purdue.edu/.

economy-wide framework.[109] The model applies a global data base of trade data characterizing linkages among regions and input-output data accounting for inter-sector linkages within regions. The most current GTAP database, version 9, covers the world in 2004, 2007, and 2011 and contains 140 regions (including Canada, Mexico, and the United States) and 57 industry sectors (including ferrous metals).[110]

A general equilibrium model is a useful tool for analyzing the effects of economic policy changes on the overall economy, specific economic sectors, trade flows, and the global economy. The model initially reflects a global economy in equilibrium – that is, prices are at levels that equalize supply and demand for goods, services, and factors of production. To implement a policy change, such as a duty reduction, the model is "shocked" into a state of disequilibrium by changing one or more policy variables (e.g., the AD duties on steel from China). Prices and quantities adjust to a new equilibrium, with different levels of exports, imports, production, employment, consumption, investment, and GDP. Because the model incorporates sector specific information, it is able to capture both upstream and downstream changes associated with a given policy change. The figure below offers a simplified summary of how a tariff reduction is flowed through the GTAP model.

[109] The modeling framework, data base, and select applications are provided in Tomas W. Hertel, ed. *Global Trade Analysis Modeling and Applications*. Cambridge University Press (1997).
[110] *Global Trade, Assistance, and Production: The GTAP 8 Data Base*. Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University (February 2013) at https://www.gtap.agecon.purdue.edu/.

Schematic Diagram of GTAP Analysis: Removal of Antidumping Duty



The GTAP model is flexible in that it allows the modeler to consider a variety of assumptions. For example, the model can be set up to assume full employment such that any policy shock that affects labor leads to wage increases, rather than an increase in the number of workers. Or it can be set up to assume that wages do not change and that any increase in demand leads to the utilization of additional workers rather than an increase in wages. The model can also implement a variety of shocks, such as changes in tariffs, quotas, productivity, wage rates, and rates of return on capital investment.

The model is well suited to examine the potential sectoral and economy-wide effects of conveying NME treatment to China at a time when China's domestic steel prices remain artificially low.

2. Experiment design

Two simulations are conducted to explore the economic effects of granting China market economy status. The first simulation, SIM 1, is focused on the steel industry while the second simulation, SIM 2, considers all tradeable goods. Both experiments are conducted on a single database aggregated into seven industries, five regions, and five factors of production. *Steel using* industries were selected based on the amount of steel they consumed in 2011. They consist of the oil, lumber, nonferrous metals, fabricated metal products, motor vehicles, other transportation, machinery and equipment, and construction industries. The Appendix contains a more detailed description of the compositions of the other sectors.

Table V-2. Sectors for GTAP Simulations

Sectors	Regions	Factors of Production
Primary-Food	Canada	Land
Primary-Mining	Mexico	Natural Resources
Ferrous Metals	United States	Skilled Labor
Steel Using	China	Unskilled Labor
Other Manufacturing	Rest of World	Capital
Utilities		
Services		

There are two important assumptions that are operationalized through the model "closure."[111] Both simulations assume that firms in NAFTA countries and China can add or reduce employment levels given a change in sectoral demand. This reflects short-to-medium run employment effects. Capital is treated the same in the two simulations. Although the GTAP model used here is not a dynamic model, it does allow for changes in capital stock that would occur over the long run. The long run is the proper time horizon for both experiments because the steel industry's adjustment to China's new status would occur over a number of years. Moreover, steel is a capital intensive industry. Thus, capital stock is allowed to adjust in the NAFTA countries and China. Third, government spending is fixed in the NAFTA countries so that lost revenues from the duties are not magnified by reductions in government spending. Because the simulations capture short (unskilled labor), medium (skilled labor), and long-run (investment) effects, its results can be interpreted as reflecting costs that occur through the long run, rather than as the total cost (or benefit) at a specific point in time. But the short-and-medium run employment effects would be significant.

Over time, because China's policies depress the costs of steel production inputs and engender excess capacity, applying market economy treatment to China in steel antidumping matters would enable China to show no dumping of steel even when the price of Chinese steel is below the free market cost of producing steel. That is, the removal of NME treatment while preserving intact China's NME behaviors in the steel industry, as well as others, would make it virtually impossible to find dumping by Chinese steel producers.

Data from World Steel Dynamics indicate that China's ex-works price for hot-rolled steel band was comparable to prices in the European Union and the United States from 2000 to 2003. But a gap in these prices emerged in 2004, soon after China's capacity expansion shifted into high

[111] Model closure reflects the mix of endogenous and exogenous variables in the model to ensure its general equilibrium properties.

gear, and that gap remains. Given this disparity in prices, China is able to export steel to the United States and undersell domestic producers without selling below the price of steel in China (adjusted for transportation and other costs). The likely margin of dumping for Chinese steel in the absence of NME treatment is zero (or close to zero) as long as Chinese current economic and sectoral policies continue to depress steel prices in China.

SIM 1 examines the impact on the steel industries of all three NAFTA countries applying market economy treatment to China. Since the GTAP database does not incorporate antidumping duties, they must be added to the existing MNF duties in the database. This is a complex task for several reasons. First, there are currently several antidumping orders in place in each NAFTA country involving multiple duty rates covering multiple groups of steel products. This alone makes it difficult to select an accurate rate. Second, many orders have multiple duty rates. For example, in U.S. cases there can be as many as four rates: one for each of the two mandatory respondents; an average of those two rates for a third group of companies that that responds to the DOC's questionnaire; and an "all others rate," almost always higher than the other rates, for companies that do not respond. Third, the bond that is collected to offset the dumping is almost always adjusted later (i.e., increased, partially refunded, or totally refunded) for imports during the previous year.

Despite these hurdles, an antidumping duty must be incorporated into the database. For reasons described in the Appendix, that duty is approximately 30 percent, which is added on to the existing MNF tariffs in the GTAP database using the *altertax* routine.[112] This rate is generally consistent with previous work that considered how margins on dumped steel from China differed from margins in market economy cases involving the same products.[113]

In addition, there is a very high likelihood that the Armington elasticities in the GTAP model, particularly for the steel industry, are too low, particularly for a long run simulation. These elasticities, which determine the sensitivity of relative quantities to changes in relative prices, are extremely important for estimating the trade and other economic effects of policy-changes, such as changes in duty rates that would result from granting market-economy treatment to China.[114]

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[112] The *altertax* routine is used to change the existing calculated tariff in the GTAP database to take into account information that was not included in the original GTAP database. It does so in a way that causes minimal change to the other values in the database.

[113] United States General Accountability Office ("GAO"). *U.S.-China Trade: Eliminating Nonmarket Economy Methodology Would Lower Antidumping Duties for Some Chine Companies*. GAO-06-231 (January and April 2006) at http://www.gao.gov/assets/250/248916.pdf.

[114] Christine A. McDaniel and Edward J. Balistreri. *A Review of Armington Trade Substitution Elasticities*. (September 2002) at 2. "The Armington elasticity is an essential component of trade policy analysis. Applied partial and general equilibrium models that rely on the Armington structure are universally sensitive to these elasticities.

Analyses have found that 1) long-run elasticities should be larger than short-run elasticities;[115] 2) the elasticities in the database tend to underestimate economic effects of a change in policy;[116] 3) that higher elasticities, particularly for the steel industry, would have produced results that more accurately matched actual outcomes.[117] In fact, among the 45 tradeable goods sectors examined in one study, the elasticity of substitution for steel had the second worst "measure of fit" and the elasticity of substitution between the domestic product and the imported product that would match trade effects was more than 5 times as high as that in the current database.

For these reasons, the Armington elasticities in the database for the steel industry were modified as follows. In SIM 1A, the elasticity of substitution between the domestic product and imports was set to equal the elasticity of substitution for the Primary-Mining sector. In SIM1B, the elasticity of substitution for steel was set to equal the average of the elasticities for the Primary-Mining and Steel Using sectors.[118] More details are presented in the Appendix.

In SIM 2, the analysis considers the effects of applying market economy treatment in other tradeable goods sectors. Given the imprecise nature of calculating the appropriate duties to apply across all tradable sectors of NAFTA economies, this experiment models the effect of market economy treatment differently. Rather than eliminating the antidumping duties applied to all industries, this simulation shocks the rates of return on investments in NAFTA countries. The logic underlying this methodology is straightforward. The existence of, and potential for, dumping by Chinese producers increases the investment risk faced by investors in those industries competing with imports from China. Thus, they require an addition to their rates of return to compensate them for this additional risk. In the GTAP model, this dynamic is implemented by shocking the variable *cgdslack* for each of the NAFTA economies.[119] To allow the model to reflect the long run, capital and the quantity of labor is allowed to adjust to the shock rather than wages.

Indeed, a modeler's central Armington choice will drive key quantitative, and sometimes qualitative, results that policymakers use."

[115] Mario J. Crucini and J. Scott Davis. "Distribution Capital and the Short- and Long-Run Import Demand Elasticity." Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute Working Paper No. 137. (January 2013) at 22, 25-26.

[116] Russel H. Hillberry, Michael A. Anderson, Edward J. Balistreri, and Alan K. Fox (Hillberry, et al.). "Taste Parameters as Model Residuals: Assessing the Fit of an Armington Trade Model." (September 2002); and Edward J. Balistreri, Ayed Al-Qahtani, and Carol A. Dahl. "Oil and Petroleum Product Armington Elasticities: A new-geography-of-trade approach to estimation." (October 2009) at 2 and 13.

[117] Hillberry, et al.) at 12.

[118] Douglas A. Irwin. "Could the U.S. Iron Industry Have Survived Free Trade after the Civil War?" (January 2001) at 10-13. Irwin found, using data from 1867 to 1889, found that the long-run substitution elasticity for iron was 6-to-7, more than twice as high as the short-run elasticity.

[119] Gerard Malcolm. *Modeling Country Risk and Capital Flows in GTAP*. GTYAP Technical Paper No. 13. September 1998).

The advantage of this approach is that the effects are not confined to just the steel sector. The disadvantage is that the shock is less precise due to the uncertainty regarding how much the required rate of return would increase. The choice here is to model the impact as a one-percent increase in rate of return required by investors in tradeable goods sectors.[120] Spread over the economy as a whole, the required shocks are 0.33 percent for Canada, 0.35 for Mexico, and 0.22 for the United States.

Due to the lack of precision in the elasticities and shocks in both scenarios, systematic sensitivity analysis (SSA) is performed on each simulation using the SSA tool provided with the GTAP model. This provides a range of outcomes for each scenario and its sensitivity to the modeling choices such as the magnitude of the estimated duty, the elasticity of substitution value, and the size of the rate-of-return-shock.

3. Results

The simulation results are presented in two parts. SIM 1 is presented first. The impact is predictably bad for NAFTA steel industries and NAFTA overall. SIM 2, which considers other tradeable goods industries, shows smaller effects on the steel industry and larger negative effects on NAFTA overall.

a) Results for SIM 1

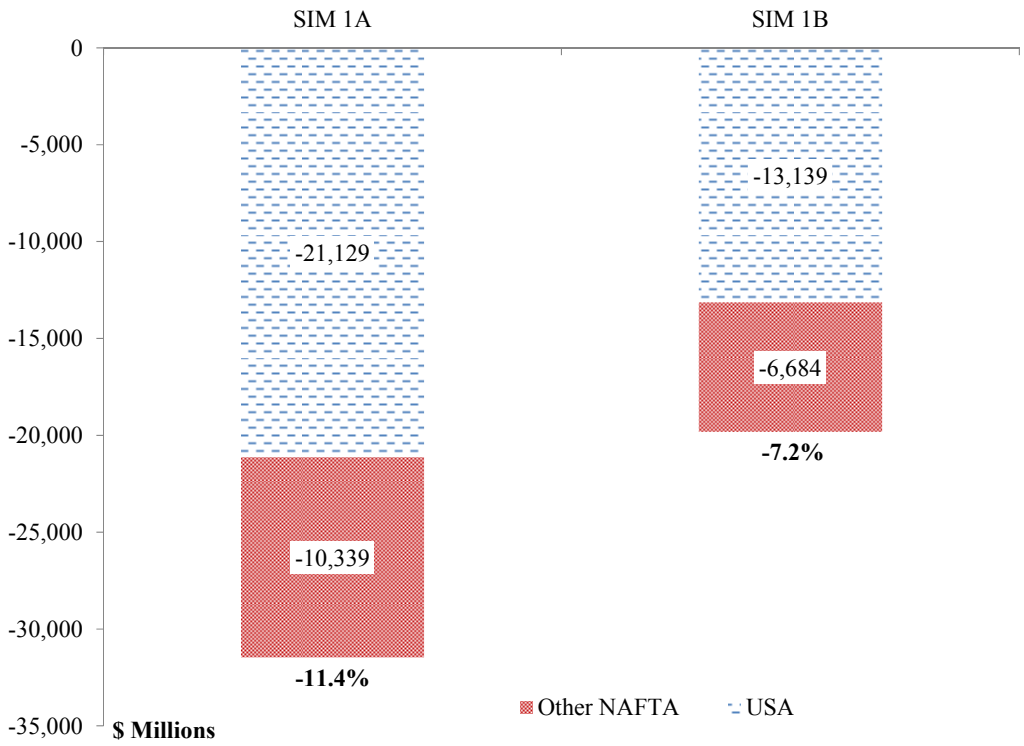
According to all three simulations, conferring ME treatment on China would lead to significant economic harm to the NAFTA steel industry, with significant declines in output, labor earnings, and reduced capital stock.

The figure below shows the decline in total shipments of the two scenarios. The reductions in NAFTA-wide steel output amount to just over $30 billion (-11.4 percent) in SIM 1A and but under $20 billion (-7.2 percent) in SIM 1B. Given that wages are held constant in the model, these results imply comparable reductions in industry employment levels and industry demand for capital as well.[121]

[120] The tradeable goods sectors are *primary food*, *primary mining*, *steel manufacturing*, *steel using*, and *other manufacturing*.

[121] As this simulation captures short, medium, and long-term effects, the full impact of the policy change is not complete until changes in capital stock are complete, roughly a 20 year period. However, the majority of the effects would occur during the short-to-medium term. Thus, most of the effects shown in most of the tables would have occurred by the fifth year.

Figure V-11. Simulated Reductions in NAFTA Steel Output



A shown in the table below, the severity of the effects varies. In percentage terms, the effects are worse for NAFTA than for the United States. In the United States, the output and employment effects are less than 10 percent in both scenarios, but the absolute values are significantly larger than those experienced in NAFTA as a whole.

Table V-3. Simulated Reductions in Steel Output, in Percent

	SIM 1A	SIM 1B
	Relative to Base	
USA	-9.9%	-6.2%
NAFTA	-11.4%	-7.2%

In short, the model predicts that if NAFTA countries grant China market economy treatment prematurely, the NAFTA steel industry will experience a significant contraction, with reductions in output, employment, and investment of approximately 10-percent from current levels.

One of the advantages of a CGE model is that it permits an analysis of changes in different economic variables and in the economy overall that would result from the suspension of NME

treatment for China. The first effect is that dumping would resume as price-to-price comparisons would yield small or zero antidumping margins. Existing orders would be revoked and demand for Chinese steel would be stimulated because there would be no discipline from an order or threat of a case. With increasing quantities of steel imports from China, the average price of steel imports would decline. According to SIM 1A, the average unit value of total imports would decline by 4.5 percent to 8.0 percent. These price declines would lead to large increases in steel imports in NAFTA countries. According to SIM 1A, NAFTA imports of ferrous metals would increase by $17.4 billion in the long run with a $13.3 billion increase in the United States alone. Because the United States is a major exporter of steel to both Mexico and Canada, and those countries will be increasing imports from China, the model predicts there will be significant reductions in U.S. steel exports to NAFTA partners. In the domestic market, all industries would demand less domestically produced steel. For example, the *steel using* sector in the United States demands $10.3 billion less in steel from domestic producers.

The macroeconomic effects of changing China's treatment prematurely are interesting because they indicate that the losses experienced by the steel industry will have adverse consequences to the overall economy in the short run as well in the long run. Economists prefer to assess policy changes based on their implications to economic welfare. Conceptually, welfare refers to the gains and losses to consumers and producers in the economy.

These long run simulations show potential for adverse economy-wide effects arising from granting market economy treatment to China prematurely. Relative to GDP, the welfare effects are meaningful but proportionately much smaller than the effects on the steel industry in isolation, and are largely accounted for by the United States.

Table V-4. Changes in NAFTA Economic Welfare in SIM 1

	SIM 1A	SIM 1B
	Percent of Base	
USA	-0.26%	-0.12%
NAFTA	-0.23%	-0.10%

The simulations also allow the assessment of short-to-medium-term employment effects. That is they allow us to answer the question, "what is the value of the change in labor demand that results due to the policy change?" On an economy-wide basis, this is a net figure; that is, it considers any increase in employment in other sectors, as well as any reductions experienced by the steel industry and its supply chain. The data, shown in the table below, indicate that labor demand in NAFTA would decline by approximately $15 billion to $32 billion on an economy-wide basis, most of which would occur in the United States.

Table V-5: Changes in NAFTA Labor Demand in SIM 1

	SIM 1A	SIM 1B
	$ Millions	
USA	-29,656	-14,773
NAFTA	-32,112	-15,606

The predicted labor effect is quite large, with jobs declining by an estimated 434,000 to 595,000 workers on an economy-wide basis.[122] Employment effects would likely follow a step-wise trajectory, with large declines occurring as plants close.

An important factor that is generally ignored in CGE analysis is that capital investments are also affected by market distortions. Such investments are critical in advanced economies and generally support high wages by enhancing efficiency. SIM 1 shows a decline NAFTA capital stock of -$144 billion, compared to a $98 billion increase in China's capital stock.

b) Results for SIM 2

SIM 2 considers a different transmission mechanism for assessing the effects of granting China market economy status. Rather than estimating duties for individual sectors and then shocking the model to eliminate those duties, SIM 2 considers how investors in U.S. tradeable goods sectors might perceive China's graduation to market economy status. The ability of companies to utilize antidumping laws to deal with dumping reduces the risk to revenues and profits from prolonged Chinese dumping. In the absence of NME treatment for China, the efficacy of the antidumping laws is likely to erode significantly until the Chinese government stops interfering with market mechanisms. This increases the risk faced by investors in tradeable goods sectors, and leads them to demand a higher risk premium whenever they invest in at-risk sectors. This simulation is potentially superior for assessing the potential effects of NME graduation because it considers affects in other industries. However, it does not account for potential differences in China margins across different industries.

The welfare results of SIM 2 are very similar to those of SIM 1, especially for the United States. For example, U.S. economic welfare declines by $46.4 billion (versus $40.1 billion in SIM 1A) and labor demand declines by $29.1 billion (versus $29.6 billion in SIM 1A). However, there are

[122] GDP per capita according to the Bureau of Economic Analysis was $49,710 in 2011. Using this measure, the decline in labor demand translates into approximately 595,000 jobs. According to the Bureau of Labor Statistics, average monthly non-farm employment was 131.8 million in 2011. Dividing this number into the sum of skilled and unskilled labor demand in the GTAP database, $9.1 trillion, yields a value of $68,357 per employed person. Based on this measure, the estimated decline in labor demand translates into approximately 434,000 jobs

much larger losses for NAFTA overall in SIM 2. For example, the welfare losses to NAFTA as a whole are $68.5 billion (versus $42.3 billion in SIM 1A).

The likely explanation of these differences is that, compared to the United States, the steel industries in Mexico and Canada are proportionately smaller than other industries. Thus in SIM 1, the harms that arise to the steel industry are partially offset to a greater extent than in the United States. SIM 2 considers that other industries, including steel using industries such as fabricated metal products, also benefit from the current practice of treating China as an NME and would be harmed by granting China market economy status prematurely.

c) Summary of sensitivity analysis

Trade policy experiments such as the ones in this report are more useful when they take into account uncertainty. For example, the above simulations rely on the estimate that Chinese dumping margins on steel would decline by approximately 29 percentage points in all NAFTA countries if China were treated like a market economy. Although this estimate is conservative relative to estimates appearing in a report by the U.S. Government Accountability Office, it is prudent to develop a range of outcomes that takes into account that the change in the duty might be higher or lower than the estimated 29 percent.[123] Uncertainty in the estimated substitution elasticity has also been taken into account.

The results are shown in the table below. They indicate that there is a strong possibility of meaningful welfare losses for NAFTA and the United States.

Table V-6: Point Estimates and Ranges for Sim 1 and Sim 2 Welfare Losses

	United States	**NAFTA**
	$ Billions	
Point Estimates	-$46.5 to -$40.2	$-68.5 to -$42.5
Range	-$70.0 to -$16.3	-$78.4 to -$13.3

d) U.S. welfare under different scenarios

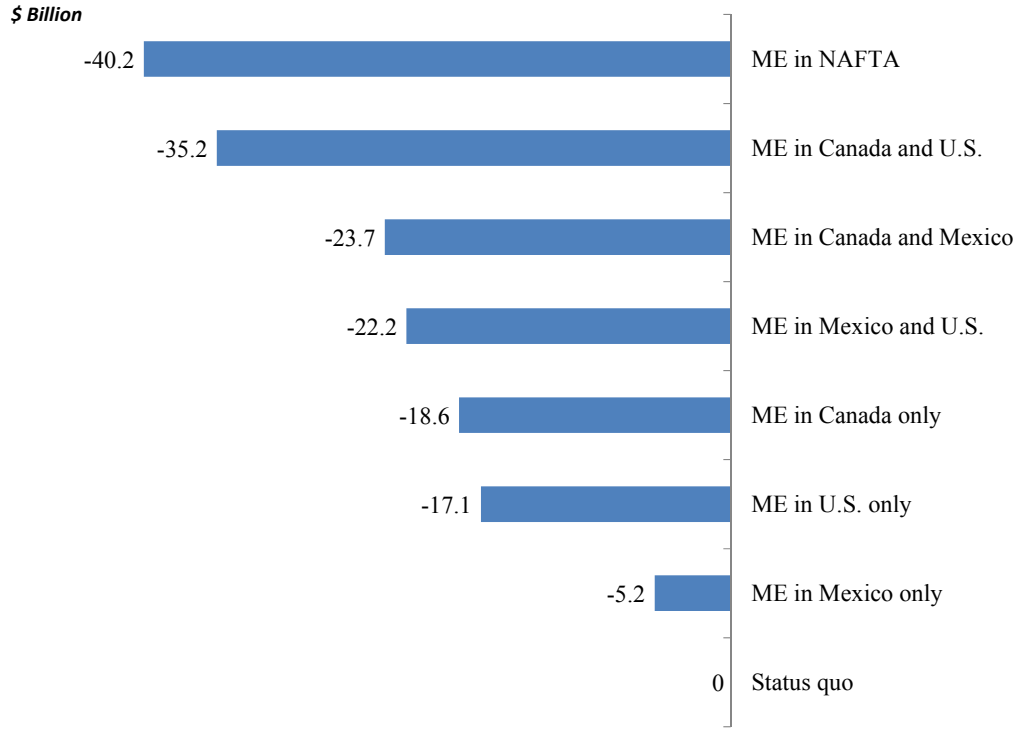
The simulations above considered how the United States and NAFTA overall would fare if NAFTA countries graduated China to market economy status. However, in theory it is possible

[123] United States General Accountability Office ("GAO"). *U.S.-China Trade: Eliminating Nonmarket Economy Methodology Would Lower Antidumping Duties for Some Chine Companies*. GAO-06-231 (January and April 2006) at http://www.gao.gov/assets/250/248916.pdf. The GAO found that the largest difference between margins in market economy cases and margins in NME cases involving China occurred due to high country-wide rates for China. However, when comparing individual company rates between China and market economies involving the same steel products, the China rates exceeded market economy rates by 30 percentage points or more (see, e.g., Figure 7 at 24 of GAO report).

that the three NAFTA countries may choose to follow different policies, with one or two choosing to treat China as a market economy for purposes of antidumping.

The figure below illustrates the different outcomes for the United States. From the standpoint of economic welfare, the best outcome is the status quo, while the second best outcome is if Mexico alone grants ME treatment to China, while Canada and the United States maintain NME treatment. The worst outcome for the United States is for all three NAFTA countries to grant ME treatment to China, while the second worst outcome is for Canada and the United States to grant ME treatment to China while Mexico does not. Generally, the smallest welfare losses to the United States occur when only one NAFTA country defects, while larger losses occur when two NAFTA countries defect. If one country defects, the United States is better off if the defector is Mexico rather than Canada.

Figure V-12. U.S. Welfare Results under Different ME Arrangements (SIM 1A)



F. Conclusions

As the fifteenth anniversary of China's entry into the WTO draws near, it is plain that market distortions in China, largely government induced, continue to create major imbalances in certain industries. The pattern is a familiar one. The government of China identifies favored industries and, with the help of state-owned firms and/or banks, subsidizes the development and expansion of those industries. These industrial policies enable China to replace imports with exports, and then to export large quantities in international markets at prices that do not reflect true costs. For

many products in many industries, including steel, the end result is dumping, lost jobs, and an injured U.S. industry.

Antidumping laws are used by injured industries to seek relief from dumping. Antidumping duties are meant to offset the dumping so that U.S. companies compete against fairly traded imports rather than dumped imports. But in order to calculate accurate dumping margins, it is necessary to have prices in the home market that reflect market forces, not government industrial plans, subsidies, and government depressed input costs. With China, the same market distortions that lead to dumping are also the same distortions that prevent the use of Chinese prices in antidumping calculations. So, from the perspective of government policy in the United States and NAFTA partners, it makes no sense to treat China as a market economy for purposes of antidumping calculations while the policies that cause dumping in so many industries persist.

The question of whether to maintain NME treatment for China is not purely academic. It has the potential to greatly affect several U.S. industries and their workers. The steel industry in particular is likely to experience a significant contraction if the U.S. government and other NAFTA governments treat China like a market economy for antidumping purposes before China is further along in its economic transformation.

G. Appendix

This appendix presents more detailed treatment and discussion of several items described in the text: the derivation of the current AD duty rate on Chinese steel imports into NAFTA countries; the decision to use higher Armington elasticities for trade in steel; and the experiment design for the GTAP model simulations.

1. Derivation of current AD duty rates for NAFTA imports of steel from China

The derivation of the antidumping duties on steel from China was based on actual duties applied on Chinese steel (and fabricated products that are largely steel) in NAFTA countries as of December 2014. The table below contains existing order on a select group of U.S. antidumping orders on steel and steel intensive products. Due to administrative reviews, the current duties in effect are in some case lower than they were after the original investigation. Existing lower bound duties range from 0 percent to 247.9 percent, with a median of approximately 35 percent. Upper bound duties in effect range from 25.5 percent to 430 percent, with a median rate of 111.4 percent.

Table V-7. Sample of U.S. AD Rates on Steel and Steel Intensive Products from China

		Original AD duty		12/14 AD duty	
Product	Order Date	Lower bound	Upper bound	Lower bound	Upper bound
Cut-to-Length Carbon Steel Plate	10/21/2003	17.3%	128.6%	0.0%	128.6%
Steel Concrete Reinforcing Bar	9/7/2001	133.0%	133.0%	133.0%	133.0%
Certain Hot-Rolled Carbon Steel Flat Products	11/29/2001	64.2%	90.8%	12.3%	90.8%
Certain Circular Welded Carbon-Quality Steel Pipe	7/22/2008	69.2%	85.5%	45.4%	68.2%
Light-Walled Rectangular Pipe and Tube	8/5/2008	249.1%	264.6%	247.9%	255.1%
Circular Welded Austenitic Stainless Pressure Pipe	3/17/2009	10.5%	55.2%	0.0%	55.2%
Certain Steel Threaded Rod	2/27/2009	55.2%	206.0%	47.6%	206.0%
Certain Circular Welded Carbon Quality Steel Line Pipe	5/13/2009	73.9%	101.1%	73.9%	101.1%
Oil Country Tubular Goods	5/21/2010	32.1%	99.1%	32.1%	162.7%
Prestressed Concrete Steel Wire Strand	6/29/2010	43.0%	193.6%	43.0%	193.6%
Certain Steel Grating	7/23/2010	136.8%	145.2%	38.2%	145.2%
Carbon and Certain Alloy Steel Wire Rod	11/19/2014)	106.2%	110.3%	106.2%	110.3%
Wire Decking	6/10/2010	14.2%	143.0%	14.2%	143.0%
Certain Seamless Carbon and Alloy Steel Standard, Line and Pressure Pipe	11/10/2010	50.0%	98.7%	50.0%	98.7%
Drill Pipe	3/3/2011	69.3%	430.0%	69.3%	430.0%
Galvanized Steel Wire	3/26/2012	194.0%	235.0%	194.0%	235.0%
High Pressure Steel Cylinders	6/21/2012	6.6%	31.2%	6.6%	31.2%
Prestressed Concrete Rail Tie Wire	6/24/2014	31.4%	35.3%	31.4%	35.3%
Non-Malleable Cast Iron Pipe Fittings	4/7/2003	6.3%	75.5%	0.0%	75.5%
Malleable Iron Pipe Fittings	12/12/2003	7.4%	11.4%	7.0%	111.4%
Iron Construction Castings	5/9/1986	11.7%	11.7%	25.5%	25.5%
Carbon Steel Butt-Weld Pipe Fittings	7/6/1992	35.1%	182.9%	35.1%	182.9%
Tapered Roller Bearings	6/15/1987	0.0%	92.8%	0.0%	92.8%
Steel Wire Garment Hangers	10/6/2008	15.8%	187.3%	15.8%	187.3%
Utility Scale Wind Towers	2/15/2013	45.0%	70.6%	45.0%	70.6%
Drawn Stainless Steel Sinks	4/11/2013	27.1%	76.5%	27.1%	76.5%
Steel Nails	8/1/2008	0.0%	118.0%	3.9%	118.0%

The table below contains Mexican AD duties on imports of steel and steel intensive products from China as of December 2014. The median lower bound AD rate is 51 percent while the median upper bound rate is 130 percent. Since December 2014, there have been several additional cases and/or orders imposed by Mexico against steel imports from China.

Table V-8. Sample of Mexican AD Rates on Steel and Steel Intensive Products from China

		12/14 AD duty	
Product	Order Date	Lower bound	Upper bound
Wire Mesh (Malla Cincada)	7/24/2002	8.0%	50.0%
Steel Chain (Cadena de acero)	7/17/2003	40.0%	130.0%
Nails (Clavos)	11/29/2004	39.0%	300.0%
Fittings (Conexiones de acero para soldar a tope)	8/4/2004	31.0%	150.0%
Nuts (Tuercas)	1/7/2008	64.0%	64.0%
Seamless Pipe (Tubería sin costura)	2/24/2011	63.0%	130.0%
Seamless Pipe (Tubería sin costura)	1/7/2014	62.0%	170.0%
Wire Mesh Galvanized Carbon Steel (Malla o tela galvanizada de alambre)	10/9/2014	62.6%	160.0%
Cut-to-length Plate (Placa en hoja)	10/14/2014	34.0%	34.0%
Steel Wire (Cables de acero)	12/16/2014	74.4%	74.4%

The table below contains Canadian AD duties on imports of steel and steel intensive products from China as of December 2014. The median lower bound AD rate is approximately 97 percent.

Table V-9. Sample of Mexican AD Rates on Steel and Steel Intensive Products from China

		12/14 AD duty	
Product	Order Date	Lower bound	Upper bound
Flat hot-rolled carbon and alloy steel sheet and strip	11/16/2010	77.0%	77.0%
Hot-rolled carbon and high strength low alloy steel plate	7/16/2010	80.2%	80.2%
Casing, seamless carbon steel or alloy oil and gas well	11/7/2011	91.0%	91.0%
Oil Country Tubular Goods	11/7/2011	166.9%	166.9%
Pup joints	4/11/2012	173.4%	173.4%
Steel piling pipe	11/30/2012	96.4%	96.4%
Carbon steel welded pipe	2/14/2011	179.0%	179.0%
Carbon steel welded pipe	12/11/2012	54.2%	54.2%
Carbon steel bar grating and alloy steel bar grating	4/20/2011	85.0%	85.0%
Carbon steel fastners (i.e.: carbon steel screws)	9/23/2011	170.0%	170.0%
Stainless steel sinks	5/25/2012	103.1%	103.1%
Concrete reinforcing bar	12/10/2014	17.1%	41.0%

As discussed in the text, the application of multiple rates to different companies, the variety of 10-digit HS codes in each order, and other factors make it difficult to choose an accurate duty reduction to apply to the model. In order to estimate a rate for each country, the median lower bound value was calculated for each country based on steel product categories used by AISI. As a practical matter, this meant excluding rates for steel-intensive products, such as steel sinks,

hangers, and nuts, that are not included in the main AISI steel categories, and which the GTAP database classifies as "fabricated metal products" rather than "ferrous metal products." The current AD orders in NAFTA countries only affect some of the HS codes and steel industry segments, and these codes and segments vary across NAFTA partners. This means that the estimated duty rates have to be scaled down before they can be applied to the steel sectors of the three countries. To facilitate this transformation, it was assumed that absent the existing duties on Chinese steel imports, those imports would be distributed proportionally to total imports of steel in each NAFTA country. The median duties calculated were then adjusted to reflect the proportion of national steel imports in which the duties are being applied. For example, if the existing U.S. duties cover product categories that account for 50 percent of total U.S. steel imports and the average of the median lower and upper bound U.S. AD duty on steel imports from China is 50 percent, then the implied U.S. duty to apply to the GTAP 9 Data Base is 25 percent (i.e., 0.50 * 0.50 = 0.25). Different methodologies were employed but the estimated rates generally were 29.21 percent or above (+10 percent). Given the uncertainty involved with this exercise, the minimum rate calculated was used for all three NAFTA countries. Results were subject to sensitivity analysis so that the economic effects of market economy treatment could be estimated using different duty assumptions.

The estimated AD duty of 29.21 percent was added to the existing duty rates on steel imports from China in the GTAP Data Base for the three NAFTA counties using the *altertax* procedure, which modifies the duty rates while leaving other data points in the database largely unchanged. This revised database was used for the stimulations.

2. Armington elasticities for the steel industry

The results of trade policy experiments using CGE models, such as the GTAP model, are largely determined by behavioral parameters. For policy shocks that involve changes in tariffs, results are very sensitive to the value of the elasticity of substitution. In the GTAP model, there are two types of substitution elasticities: source substitution elasticities, which determine the substitutability among imports from different sources, and substitution elasticities between domestically produced goods and imports.[124]

Given the importance of the substitution elasticity to trade policy analysis, it is somewhat disconcerting that the true magnitude of this key parameter is not known with precision. As one study described, the most common estimation technique for estimating these elasticities has several problems: the use of point estimates as "truth" without taking into account the confidence interval; the downward bias in the elasticity because the estimation technique typically used

[124] Betina V. Dimaranan, ed. *The GTAP 6 Data Base*. Purdue University, Center for Global Trade Analysis (December 2006) at 20-1 to 20-2.

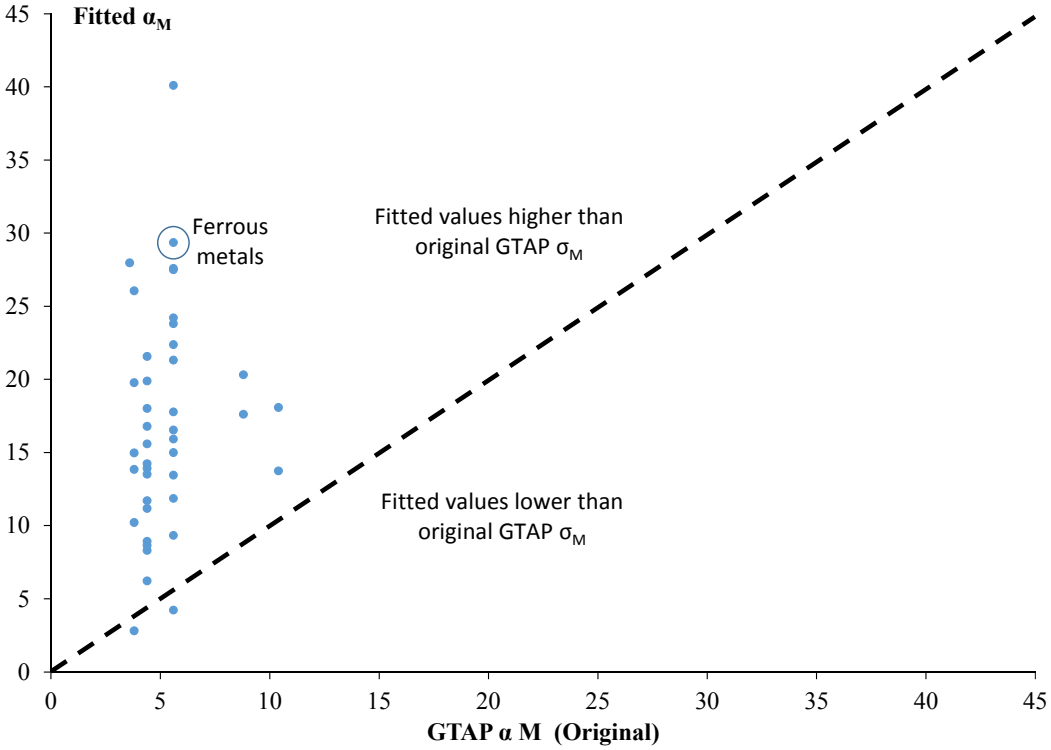
ignore quality variation; and the mismatch between the estimation data sample and the policy experiment.[125]

The earliest versions of the GTAP database used elasticities drawn from those in the seminal Salter Model, which was developed for the Australian Department of Foreign Affairs and Trade.[126] The source substitution elasticities in that model were obtained from different sources in the economic literature and from a study that estimated those elasticities for New Zealand.[127] The so-called "rule of two" was used to estimate substitution elasticities between domestically produced goods and imports.[128]

As noted in the text, the elasticities of substitution in the database have been criticized as being too low.[129] The analysis by Hillberry et al. shows that fitted elasticity values that matched trade outcomes were almost always higher than the actual values in the GTAP database.[130] As demonstrated in the figure below, the fitted value for the ferrous metals industry (i.e., the value of σ_M necessary for perfect goodness of fit) was 29.36,[131] significantly higher than the value of 5.6 in the original GTAP parameter file.

[125] Thomas Hertel, David Hummels, Maros Ivanic, and Roman Keeye. *How Confident Can We be in CGE-Based Assessments of Free Trade Agreements?* NBER Working Paper 10477 (May 2004) at 1-3 (http://www.nber.org/papers/w10477).
[126] Industry Commission of Australia. *The Salter Model of the World Economy.* (April 1994).
[127] Wear, S. *The Elasticity of Substitution between Imports from Different Sources—Estimates for New Zealand*. SALTER Working Paper No. 7 (1990).
[128] According to the rule of two, the elasticity of substitution among imports is twice the value of the elasticity of substitution elasticities between domestically produced goods and imports.
[129] Hillberry, et al. at 3 and 7. "The choice of elasticities in most CGE models is heavily informed by time series econometric literature. A growing consensus of those who used time series estimates as inputs is that such estimates are too low, and so underestimated actual responses to trade policy changes."
[130] *Id.* at 10.
[131] *Id.* at 12.

Figure V-13. Comparison of σM in Early GTAP Data Base with Fitted Values from Hillberry, et al.

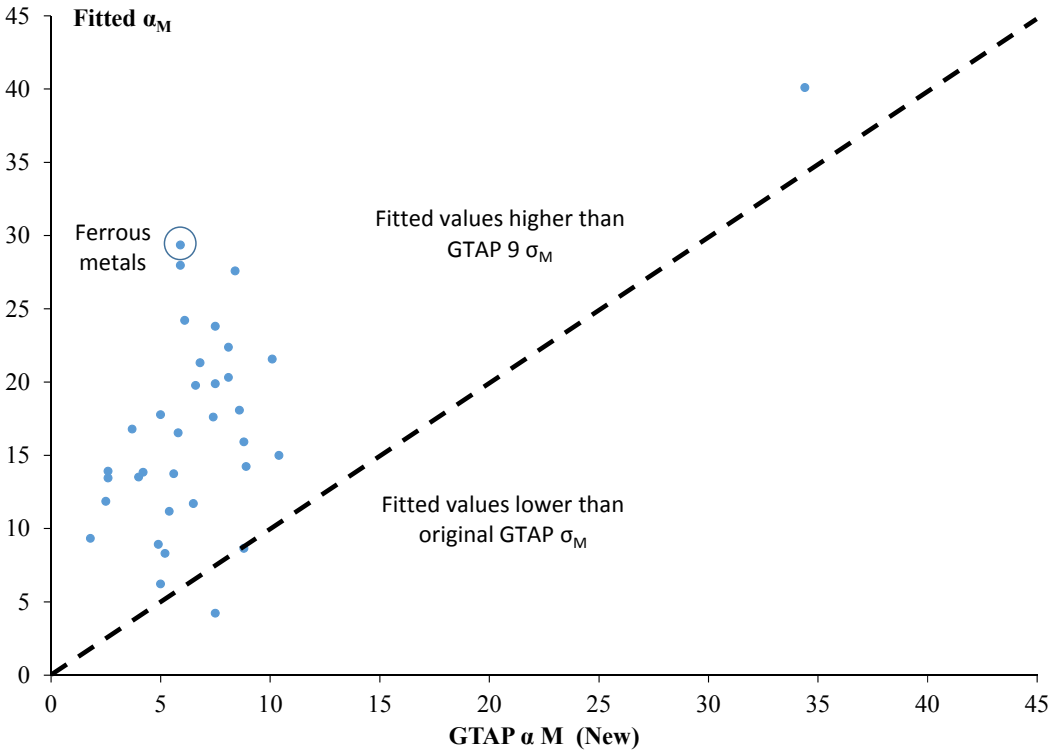


Source: Hillbery et al. (2002).

The GTAP 6 Data Base contained new source substitution elasticities based on econometric estimates by Hertel, et al.[132] The simple average of the new elasticities was 7.0 versus 5.3 for the previous versions of GTAP.[133] In addition, as shown in the figure below, there is now significantly more intersectoral variation in the newly estimated elasticities. Still, the figure also demonstrates that the new GTAP source elasticity parameters remain significantly lower than their fitted values. The new estimate for the ferrous metals sector, 5.9, is still well below the fitted value of 29.36 calculated in Hilberry et al.

[132] Dimaranan, ed., at 20-2.
[133] Dimaranan, ed., at 20-2 to 20-3.

Figure V-14. Comparison of σM in GTAP 6 Data Base with Fitted Values from Hillberry, et al.



As noted in the text, long run elasticities tend to be higher than short run elasticities.[134] According to one study that estimated both long-run and short-run elasticities, the long-run estimates are on average twice as large as the short-run estimates.[135] In addition, elasticities of substitution rise with the level of disaggregation; the more a sector is disaggregated, the higher its elasticity of substitution.[136]

3. Experiment design for GTAP model simulations

It is typical for the modeler to provide certain summary information for simulations conducted with the GTAP model.

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[134] Op. cite 115. See also, Michael P. Gallaway, Christine A. McDaniel, Sandra A. Rivera. "Short-run and long-run industry-level estimates of U.S. Armington elasticities." North American Journal of Economics and Finance 14 (2003) 56-66; Christine McDaniel and Edward J. Balistreri. "A Review of Armington Trade Substitution Elasticities." Joint Publication: Integration and Trade 7(18) p.161-173; and Economie Internationale 94-95 p.301-314; and Gabriella Németh, László Szabó and Juan Carlos Ciscar. *Estimation of Armington Elasticities in an Energy CGE Model. For Europe*. (November 24, 2008) at 14.

[135] Gallaway, McDaniel and Rivera at 56.

[136] McDaniel and Balistreri at 14.

GTAP 7x5x5 Aggregation

Developed to analyze the economic effects on NAFTA of conferring market economy treatment on China

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SUMMARY

This version of GTAP uses a 7-sector, 5-region, 5-factor aggregation. Different closures are employed to assess short- and long-run effects of ending abandoning the NME methodology.

REGIONS AND COMMODITIES

The 5 regions are:

Experiment Regions	GTAP Regions
Canada	Canada
Mexico	Mexico
USA	USA
China	People's Republic of China
Rest-of-World	Australia, New Zealand, Rest of Oceania, Hong Kong, Japan, Korea, Mongolia, Taiwan, Rest of East Asia, Brunei Darussalam, Cambodia, Indonesia, Lao, Malaysia, Philippines, Singapore, Thailand, Viet Nam, Rest of Southeast Asia, Bangladesh, India, Nepal, Pakistan, Sri Lanka, Rest of South Asia, Rest of North America, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, Rest of South America, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador, Rest of Central America, Dominican Republic, Jamaica, Puerto Rico, Trinidad and Tobago, Caribbean, Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Switzerland, Norway, Rest of EFTA, Albania, Bulgaria, Belarus, Croatia, Romania, Russian Federation, Ukraine, Rest of Eastern Europe, Rest of Europe, Kazakhstan, Kyrgyzstan, Rest of Former Soviet Union, Armenia, Azerbaijan, Georgia, Bahrain, Islamic Republic of Iran, Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates, Rest of Western Asia, Egypt, Morocco, Tunisia, Rest of North Africa, Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Guinea, Nigeria, Senegal, Togo, Rest of Western Africa, Central Africa, South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, Rest of Eastern Africa, Botswana, Namibia, South Africa, Rest of South African Customs, Rest of World

The 7 commodity sectors are:

Experiment Sectors	GTAP Sectors
Primary industry -- food	Paddy rice; wheat; cereal grains nec; vegetables, fruit, nuts; oil seeds; sugar cane, sugar beet; plant-based fibers; crops nec; cattle, sheep, goats, horses; animal products nec; raw milk; wool, silk worm cocoons; forestry; fishing; meat: cattle, sheep, goats, horse; meat products nec; vegetable oils and fats; dairy products; processed rice
Primary industry -- mining	Coal; gas; minerals nec
Steel manufacturing	Ferrous metals
Steel using sectors	Oil; wood products; non-ferrous metals; construction; fabricated metal products; motor vehicles and parts; transport equipment nec; machinery and equipment; construction
Other manufacturing sectors	Sugar; food products nec; beverages and tobacco products; textiles; wearing apparel; leather products; paper products, publishing; petroleum, coal products; chemical, rubber, plastic products; mineral products nec; electronic equipment; manufactures nec
Utilities	Electricity; gas manufacture and distribution; water
Services	Trade; transport nec; sea transport; air transport; communication; financial services nec; insurance; business services nec; recreation and other services; public administration/defense/health/ education; dwellings

The 5 factors of production are: land, unskilled labor, skilled labor, capital, and natural resources.

EXPERIMENT FILES: SHOCKS, CLOSURES AND SOLUTION METHOD

SHOCKS AND CLOSURES

The *altertax* closure is used to set existing duties on steel from China equal to MNF duties plus 29.12 percent. The resultant database is used to implement market economy treatment for China. Given current Chinese steel prices, it is assumed that margins for Chinese firms will go to zero if China is treated like a market economy for purposes of antidumping.

Simulation 1A: This experiment combines attributes of short (endogenous demand for unskilled labor), medium (endogenous demand for skilled labor), and long-run (endogenous capital stock) closures to measure different economic effects from moving China to market economy treatment for anti-dumping purposes. In recognition of research showing that elasticities of substitution in the GTAP database are low, especially for steel, the elasticities for steel are increased to levels prevailing for Primary--mining. The shock takes antidumping duties on steel imports into NAFTA from China to zero.

Simulation 1B: The closure and shocks are the same as for Sim 1A. The elasticities of substitution for steel are set at the average between primary-mining and steel-using industries.

Simulation 2: The long run closure is used. However, instead of shocking the duties on steel, it is assumed that NME treatment makes investing in NAFTA countries more risky, leading to a higher required rate of return in NAFTA manufacturing industries.

SOLUTION METHOD

Gragg 2-4-6 with automatic accuracy.

4. Sensitivity Analysis

Sensitivity analysis is useful for assessing the robustness of the results. The key assumptions for SIM 1 are the size of the duty and the magnitude of the elasticity of substitution for steel. The GTAP model performs systematic sensitivity analysis ("SSA") on both shocks and parameters. The procedure in GTAP yields means and standard deviations that allow the construction of confidence intervals that help assess the strength of the results.

SSA was performed on the size of the duty reduction. For SIM 1A, the duties for all three NAFTA countries were varied by 50 percent—that is between 14.5 percent and 43.5. The resulting mean and confidence intervals (i.e., the mean $\pm$ 1 standard deviation) for the economic welfare results are shown in the table below. They indicate that the U.S. and NAFTA results are robust as the entire interval is negative. Moreover, the effect on NAFTA economic welfare of conferring market economy status to China would still have been negative if the duty shock used in the simulation were 50 percent lower than the value actually used.

Table V-10. Sensitivity Analysis for the Duty Reduction--Welfare (SIM1 A)

	Low End	Mean	High End
		$ Millions	
USA	-61,339	-44,297	-27,255
NAFTA	-68,852	-46,295	-23,737

The results for steel industry output are shown below. For all three countries, the entire confidence intervals are negative. Not surprisingly, the effects of granting market economy status to China prematurely are likely to significantly harm the U.S. steel industry.

Table V-11. Sensitivity Analysis for the Duty Reduction--Steel Output (SIM1 A)

	Low End	Mean	High End
	Percent Change		
Canada	-28.2%	-22.3%	-16.3%
Mexico	-15.2%	-11.8%	-8.5%
USA	-14.9%	-10.6%	-6.9%

The following table contains the results of a sensitivity analysis of the elasticity of substitution between domestic and imported steel. The low end elasticity is the original value included with the GTAP database. The higher end is symmetrical about the mean. The results demonstrate that the outcome with respect to welfare is very sensitive to the elasticity of substitution. Still, this result should be considered in the context of previous work showing that the elasticity of substitution in the database would have to be much higher to match actual trade outcomes.

Table V-12. Sensitivity Analysis for the Elasticity of Substitution for Steel--Welfare (SIM 1A)

	Low End (σ=7.94)	Mean (σ=5.45)	High End (σ=2.95)
		$ Millions	
USA	-70,038	-43,152	-16,265
NAFTA	-78,410	-45,861	-13,311

The same elasticity range was used for steel output. The results, shown below, confirm that the steel industries of NAFTA countries would experience a contraction, and a potentially sharp one, if NME treatment is removed while the government-created distortions in the Chinese steel industry remain.

Table V-13. Sensitivity Analysis for the Elasticity of Substitution for Steel --Output (SIM 1A)

	Low End (σ=7.94)	Mean (σ=5.45)	High End (σ=2.95)
		Percent Change	
Canada	-29.3%	-22.0%	-14.7%
Mexico	-15.7%	-11.6%	-7.4%
USA	-14.1%	-10.3%	-6.4%

VI. The Canadian Report: The Impact of Changing China's Market Economy Status on the Canadian Economy

By Robin Somerville, Centre for Spatial Economics (C_4SE)[137]

Abstract

This paper is part of a series of studies examining the implications of changing China's market economy status in 2016 on the global steel market and the economies of the NAFTA countries. It uses the C_4SE's provincial economic modeling system to estimate the potential impact on the Canadian economy of granting China ME status before it completes reforms to its economy. The study finds this will damage the Canadian economy: leading to lower output, wages, productivity and tax revenue. The model estimates a near-term loss of up to 60,000 jobs; a permanent, long-term reduction in GPD by between C$4.1 and C$7.6 billion; a permanent reduction in non-residential fixed investment in the range of C$0.9 and C$1.7 billion annually; and a permanent decline of federal government tax revenues by between C$0.5 and C$0.9 billion. While these impacts persist in the long-run, they are more severe in the short-term. The author concludes that Canada must act in conjunction with its NAFTA trade partners to encourage the Chinese government to continue its reform – and reduce the cost of subsidies and other supports borne by its citizens. Only when the reforms have been completed should the NAFTA countries recognize China as a market economy.

A. Introduction

China's economy has evolved significantly since it joined the World Trade Organization but, despite China's stated commitments to reform, many analyses and commentaries show that it remains the case that all levels of government in China continue to actively influence and support Chinese industry and that the steel industry in particular receives a significant level of direct and indirect state support. Because of these behaviours, China is treated as a non-market economy (NME) in the trade remedy system. Based on China's protocol of accession to the WTO, certain features related to its NME status will change in December 2016, while others do not. In view of these factors, and China's dominant position in global steel production and trade, it is important to understand the economic consequences of a decision to allow China to avoid potential trade remedies available under the NME provisions of the WTO and the Canadian Special Import Measures Act and Regulations.

[137] Robin Somerville is Director of the Centre for Spatial Economics (C_4SE).

While this chapter focuses on the possible impact on the Canadian economy of a decision to change China's ME status, it builds on related work conducted by Capital Trade, Inc. (CapTrade) and the Instituto Mexicano para la Competitividad A.C. (IMCO).

CapTrade used a computable general equilibrium model (CGE) to investigate the potential effects on the NAFTA economies of granting China market economy (ME) status for purposes of antidumping investigations before China makes sufficient progress in reforming its economy. The CGE model they used is the Global Trade Analysis Project (GTAP) model developed and maintained by Purdue University. The GTAP model is a multiregional, multi-sector, static applied general equilibrium model that enables users to conduct quantitative analysis of international economic issues in an economy-wide framework.

CapTrade conducted a pair of simulations with GTAP to estimate the economic effects of granting China market economy status. The first simulation, SIM 1, is focused on the steel industry while the second simulation, SIM 2, considered all tradeable goods. In SIM 1, it is assumed that firms in NAFTA countries and China can add or reduce employment levels given a change in sectoral demand with the wage rate left unchanged. This reflects short-to-medium run employment effects. In SIM 2, the quantity of labour is fixed so any changes in labour demand are reflected in the wage rate.

Other assumptions made by CapTrade included allowing capital stocks to adjust in each shock. Steel production is a capital intensive industry; so it was important to capture changes in the distribution of capital as a result of the shocks. Finally, government spending was assumed to be fixed in the NAFTA countries so that lost revenues from duties are not compounded by reductions in government spending. CapTrade interprets the results of both SIM 1 and SIM 2 as reflecting economic costs that occur through the long-run rather than the total cost (or benefit) at a specific point in time.

In particular, SIM 1 examined the impact on the steel industries of all three NAFTA countries applying market economy treatment to China. CapTrade estimates the average antidumping rate on steel from China to be about 30% in all three economies and that the likely margin of dumping for Chinese steel in the absence of NME treatment would be zero; so the net decrease in duties for all three countries is almost 30%. The results from the GTAP model depend on the degree to which foreign and domestic steel (and other products) compete with each other and can be used as substitutes.[138] If they can be easily substituted then small changes in the price of imports relative to the domestic good will have a large impact on the demand for each.

[138] The degree of substitution between imports and the domestic good is referred to as an Armington trade elasticity.

Conversely, if they are not strong substitutes then large price increases will be required to shift demand to or from imports versus the domestic good.

CapTrade provides evidence that the Armington trade elasticities for steel products in the GTAP model are too low. CapTrade constructs alternative simulations that use a range of values for the steel elasticities. In SIM 1A, the elasticity of substitution between domestic steel products and imports was raised to equal the elasticity of substitution in the Primary-Mining sector. In SIM 1B, the elasticity of substitution for steel was reduced to equal to the average of the elasticities for the Primary-Mining and Steel Using sectors. These simulations both yielded negative results for the three NAFTA countries with the impacts from the SIM 1A scenario being more severe than those from the SIM 1B scenario. The results from these two simulations were used to inform the analysis conducted using the C4SE's provincial economic modeling system.

The analysis in SIM 2 examined the effects of applying market economy treatment in other tradeable goods sectors. The methodology for this shock differs from SIM 1. Because of the difficulty of generating average anti-dumping duty rates for all sectors in each NAFTA country, CapTrade adjusted the rates of return on investment in each NAFTA country. CapTrade argues that dumping by Chinese producers raises the investment risk faced by investors in those industries competing with imports from China; so they require a higher rate of return to compensate for the higher risk. This analysis yielded even stronger negative impacts, particularly for Canada, than seen in the SIM 1 scenarios. Unfortunately, it was not possible to replicate the assumptions for this scenario in the C4SE's modeling system because of differences in model structure but CapTrade found that the impact on the Canadian economy was three times higher than in SIM 1A.

IMCO also used GTAP to examine the effects of changing China's ME status on the global economy. They find that China's explicit and implicit subsidies to steel that lower its price relative to its cost of production will lead to that country controlling all steel production in the world if they are granted ME status by the global community. IMCO's simulations with GTAP assumed that all nations change China's ME status and that tariff rates are reduced to MFN levels for all commodities - including steel. The results of this analysis show that global welfare is marginally raised if China maintains its explicit and implicit subsidies - with China being the principal beneficiary - while the increase becomes more significant if the subsidies are eliminated. Chinese citizens gain from no longer having to subsidize the consumption of other nations.

IMCO concludes that China's explicit and implicit subsidies prove that it is not a ME and should not be treated as one under current trade remedy rules. They argue that a global monopoly on steel could be used to ration steel and to restrict the manufacture of other products outside China. Finally, they caution that if China's explicit and implicit subsidy regime becomes too expensive and collapses it could, in the absence of productive capacity elsewhere in the world, significantly disrupt the global economy: perhaps even leading to a prolonged global recession.

The next section of this report discusses the methodology and assumptions for this analysis. This is followed by a section on the results. Information is provided both nationally and by province for output, employment and government finances. The final section provides some observations and conclusions regarding the possible economic consequences of changing China's ME status.

B. Methodology and Assumptions

The model used to analyze the impact on the Canadian economy of a possible change in China's ME status in December 2016 is the C4SE's Provincial Economic Modelling System. The C4SE's provincial economic modelling system for Canada is a multi-region, multi-sector, dynamic stochastic general equilibrium model (DSGE) where the regions represented are Canadian provinces. The model produces economic impacts at an annual frequency over the medium to long-term. More information about the C4SE's modeling system can be found in Appendix A. Model results are expressed in Canadian dollars.

1. A Scenario-based Approach to Modeling Uncertainty

Uncertainty is modeled through a set of scenarios. The analysis conducted by CapTrade using the GTAP model conducted a set of scenarios designed to estimate the sensitivity of the results to changes in the assumptions. CapTrade's SIM 1A and SIM 1B scenarios along with three other scenarios examined the impact of different import substitution elasticities on the results; the robustness of their results was further examined by adjusting the change in anti-dumping duties in SIM 1A. Finally their SIM 2 scenario examined the impact of extending the analysis to cover all tradeable commodities.

The analysis for Canada using the C4SE's modeling system uses the information from CapTrade's SIM 1A and SIM 1B to provide a range of results. The user can, however, use these scenarios to infer the possible range of impacts from the additional scenarios conducted by CapTrade on these results.

To extend the assessment of uncertainty in this analysis, the C4SE has also estimated the impact of a Canadian government decision to act alone in deciding to change China's status to a market economy while the United States, Mexico and the remainder of the international community extend China's NME status.

In this report, the analysis based on CapTrade's SIM 1A is referred to as NAFTA1A scenario while SIM 1B is referred to as NAFTA1B scenario. The scenario in which Canada alone changes China's market economy status is referred to as the CA alone scenario. A final scenario, referred to as the baseline scenario, assumes that all countries extend China's NME status throughout the forecast horizon or that China successfully transitions to a market economy during the period. This is the benchmark against which each of the other scenarios is compared. This scenario is summarized in Appendix A.

2. Key Assumptions and Limitations

The main limitation of this analysis is that only the change to the steel industry and its impact on the broader economy is examined. Changing China's market economy status will, of course, have implications for other industries in Canada as they must adjust to the possibility of competing against lower priced imports from China. However, as seen in CapTrade's SIM 2, the impact on Canada's economy is likely to be amplified as more sectors of the economy are affected.

Another important limitation is introduced by the decision of other countries on whether to extend China's NME status or not. The analysis assumes that countries outside of North America extend China's NME status while the three NAFTA countries decide to change China's ME status.

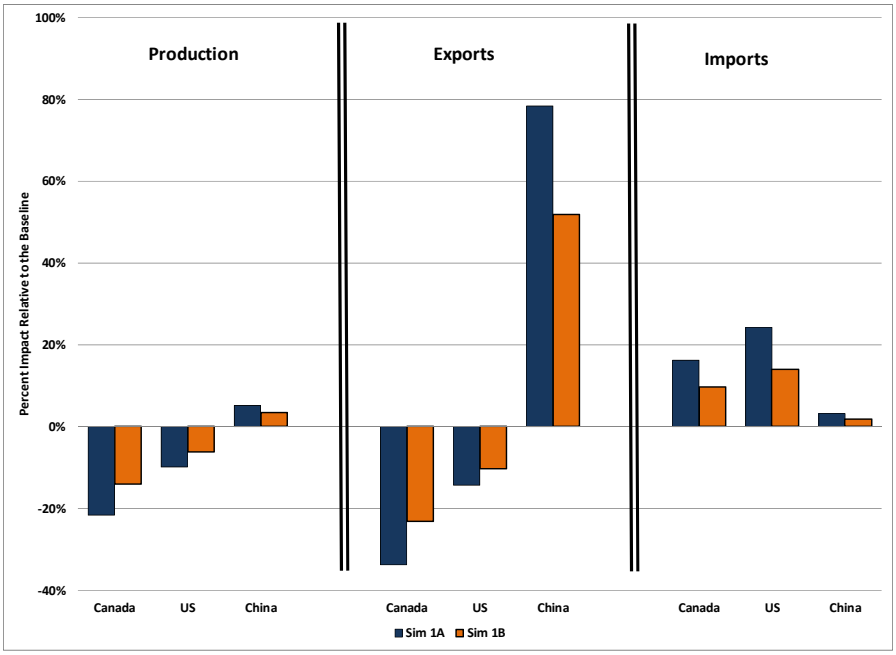
The reader should also note that the results in this report are based on the change in China's ME status impacting the economy starting in 2016. The decision to change or extend China's ME status will not, however, be made until December 2016; so will not have an impact on the economy until 2017 at the earliest. The decision to start the modeling exercise in 2016 was one of analytic convenience so as to provide more years for the model to generate long-run impacts.

The remainder of this section describes the assumptions made to the steel industry directly as a result of the change in China's ME status and to a set of international variables that are external to the C4SE's modeling system.

3. Direct Steel industry Impacts

The impact of 29.1% reduction in anti-dumping duties in the NAFTA countries from the GTAP model reduces production and exports of steel products in each NAFTA country and raises imports while China's exports and production rise. The percent decline in production and exports is more severe in Canada than the United States and larger for the SIM 1A scenario than the SIM 1B scenario (see Figure VI-1). The change in import prices as a result of the removal of anti-dumping duties and the related decline in Canadian steel production and exports are used as key inputs to the three shock scenarios run using the C_4SE's provincial economic modeling system.

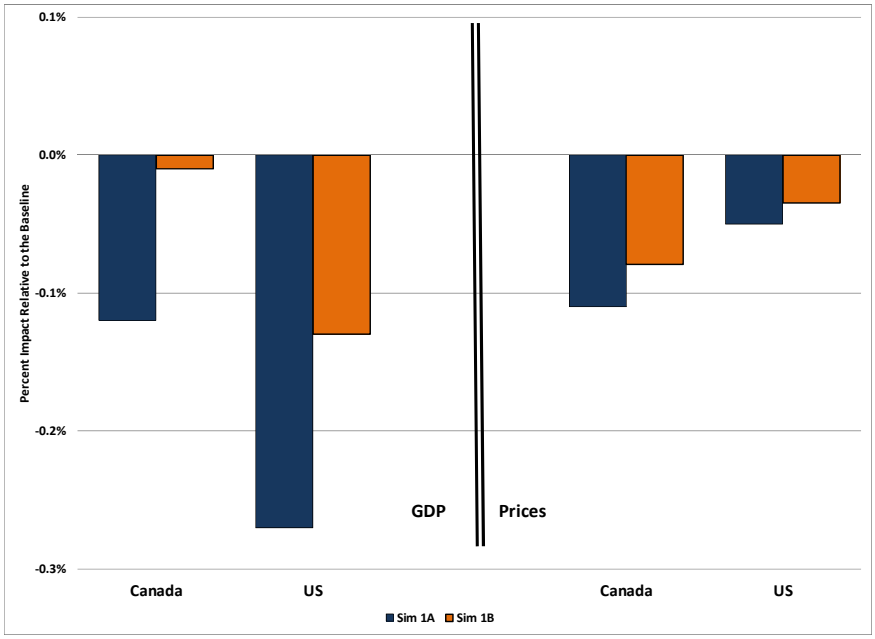
Figure VI-1. Impact on the Steel Sector of a Change in China's NME Status



4. International impacts

The impact on real GDP and prices from the GTAP model for Canada, the United States, China and the rest of the world (excluding Mexico) are summarized in Figure VI-2. The impact on US GDP is most significant; reflecting the importance of the steel sector to that economy. China's economy expands while the rest of the world is largely unaffected as they retain the option to impose anti-dumping duties when appropriate. Once again, the SIM 1B scenario impacts on output and prices are smaller than those from the SIM 1A scenario.

Figure VI-2. GTAP Impact on the Economy of a Change in China's NME Status



The results from the GTAP model are representative of a long-term equilibrium. Time does not exist in these models; so there is no information on how the economy adjusts towards this long-term equilibrium or when it reaches it. The C_4SE's modeling system, however, requires inputs through time for changes to international concepts and other variables which are not determined internally by the modeling system.

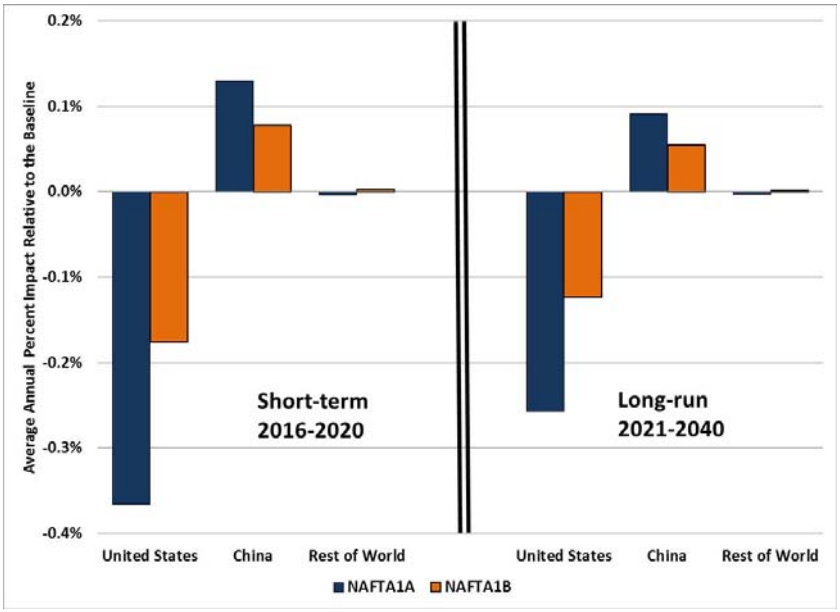
To achieve this, a time series profile of the adjustment process was generated by shocking the C_4SE's modeling system with the change in Canada's domestic steel industry from CapTrade's SIM 1A arising from a reduction in the price of steel.[139] This profile was then adjusted to yield an equivalent long-run outcome for each measure to that generated by the GTAP model for each scenario.

Figure VI-3 shows the percentage change in average annual short-term and long-run levels relative to the baseline scenario for real GDP in the United States, China and the rest of the world[140] for scenarios NAFTA1A and NAFTA1B. The short-term impacts on output are a little less than half again as large as the long-run impacts. Figure VI-4 examines the impact on prices

[139] This scenario is also referred to as the Canada Alone scenario. It omits all changes to international variables discussed in the remainder of this section.
[140] The rest of the world is represented by the Eurozone countries and Japan in the C_4SE's modeling system.

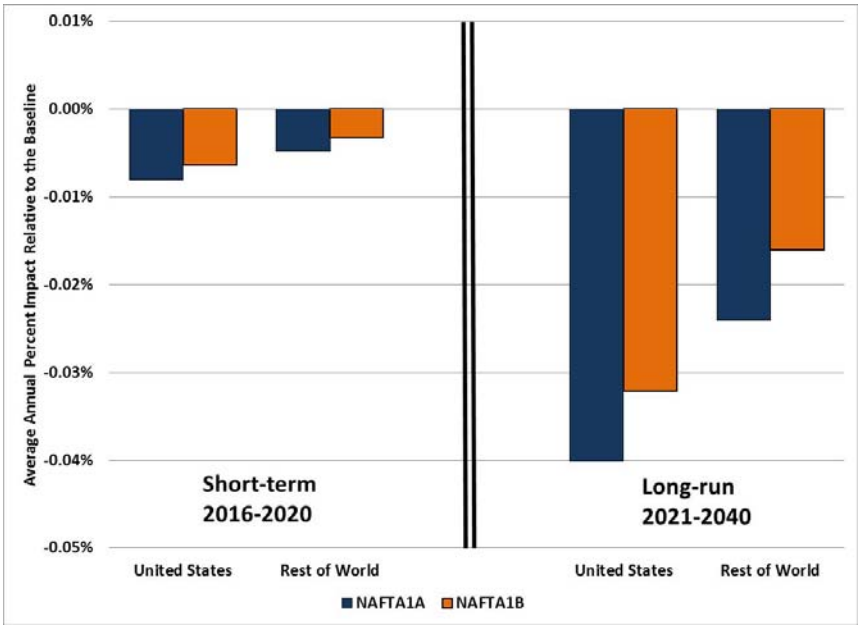
in the United States and the rest of the world.[141] Readers are urged to note the values on the axis of the chart: even in the long-run, the impact on prices is quite small.

Figure VI-3. Impact on Foreign GDP of a Change in China's NME Status



[141] The impact is measured as the average annual difference in the price level between the shock and baseline scenario and is not the difference in inflation.

Figure VI-4. Impact on Foreign Prices of a Change in China's NME Status



5. Interest and exchange rates

The GTAP model does not include interest or exchange rates. The impact on US interest rates and various exchange rates is determined through a set of simulation rues that use the annual impacts on GDP and prices developed in the previous section.

Changes in US interest rates from the baseline are generated based on a Taylor Rule. A Taylor Rule is a commonly used simulation rule for short term interest rates that considers the Central Bank's trade-off between inflation and unemployment or economic growth. The change in US short-term interest rates is determined as a weighted sum of the change in inflation from the baseline plus the change in real GDP growth from the baseline. The change in US long-term rates is generated from the change in short-term rates based on the term structure of these rates. Canadian interest rates are determined within the C_4SE's modeling system.

Changes in the US dollar versus the Euro and the Japanese Yen are determined by changes in the Purchasing Power Parity (PPP) value of each currency. PPP is an economic theory that says that exchange rates ensure that the price of a commodity across countries is the same after accounting for tariffs, taxes and transportation costs. Most economists believe that exchange rates adjust towards their PPP value over time. The change in PPP is generated by changes in moving average inflation rates in the Euro zone and Japan relative to the change in inflation in the United States.

Figure VI-5. Impact on Foreign Interest and Exchange Rates

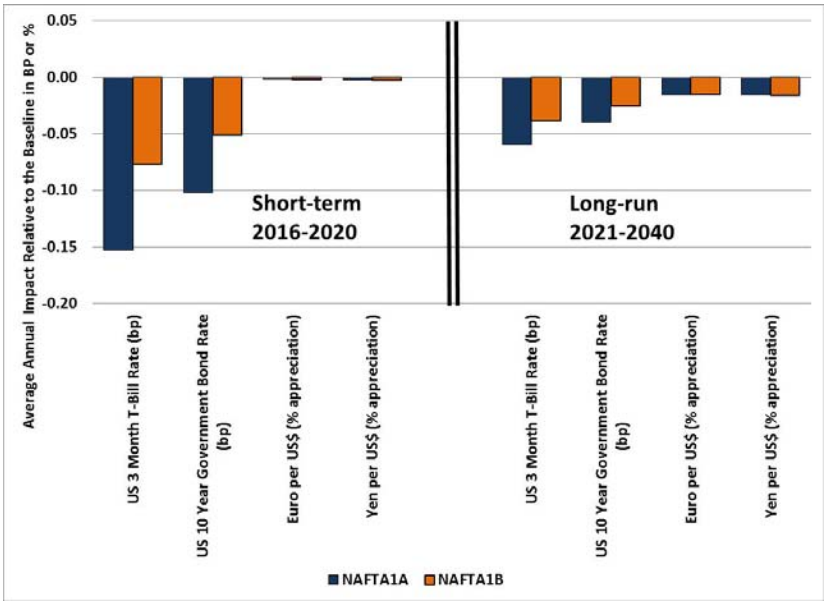


Figure VI-5 summarizes the short-term and long-run impacts on these variables relative to the baseline. The drop in US 3 month treasury bill yields, measured in basis points, is higher in the short-term; dragged down by weaker economic growth. Again, the NAFTA1A scenario impacts are larger those for scenario NAFTA1B. As for exchange rates, the impact on the Euro and the Yen expressed as the average annual percent difference in the level between each shock scenario and the baseline, is a very small depreciation versus the US dollar in the short-term which grows slightly over the long-run. Note that the percent impact on the Euro and the Yen is the same because GTAP only provides impacts for the rest of the world as a single region. Interestingly, there is difference in the impacts for the NAFTA1A and NAFTA1B scenarios because the difference in the change in inflation rates between the rest of the world and the US - or the change in PPP - is the same in both scenarios.

C. Results: Total Economic Impact

This section of the report presents the total economic impact of the change in China's market economy status. The analysis is conducted using the C_4SE's provincial economic modeling system which is a multi-region, multi-sector, dynamic stochastic general equilibrium model of Canada and its provinces. The model is described in more detail in Appendix A.

The analysis consists of the four scenarios described in the previous section: the baseline scenario, the NAFTA1A, NAFTA1B and Canada alone scenarios. Table VI-1 summarizes the economy impact from these scenarios by comparing activity in the three scenarios in which China's market economy status is changed against the baseline scenario.[142]

Table VI-1. China's NME Status Impact on the Canadian Economy: Summary

Difference from the Baseline Scenario	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
GDP (millions of 2014 dollars)				
NAFTA 1A	-9,117	-7,602	-0.42%	-0.29%
NAFTA 1B	-4,902	-4,080	-0.23%	-0.15%
Canada alone changes NME status	-7,560	-6,611	-0.35%	-0.25%
Employment (thousands)				
NAFTA 1A	-51	-8	-0.3%	0.0%
NAFTA 1B	-27	-4	-0.1%	0.0%
Canada alone changes NME status	-41	-7	-0.2%	0.0%
Annual Real Wage (2014 dollars)				
NAFTA 1A	-458	-463	-0.4%	-0.4%
NAFTA 1B	-244	-242	-0.2%	-0.2%
Canada alone changes NME status	-370	-384	-0.3%	-0.3%
Non-Residential Fixed Investment Spending (millions of 2014 dollars)				
NAFTA 1A	-2,897	-1,745	-0.8%	-0.4%
NAFTA 1B	-1,543	-927	-0.4%	-0.2%
Canada alone changes NME status	-2,404	-1,517	-0.7%	-0.3%

The total impacts for the NAFTA1A and NAFTA1B scenarios in Table VI-1 include the direct change in Canada's domestic steel industry, the price of steel and international economic activity from the previous section plus the indirect impact on suppliers to the steel industry of everything from iron ore to office supplies plus the induced impacts. Induced impacts include the impact on the economy from employees at the direct and indirect level as they spend their incomes – spending that in turn generates income for others, who re-spend it.[143]

The impact on GDP, measured 2014 dollars, during the short-term (2016 to 2020) varies between $4.9 and $9.1 billion a year on average lower than in the baseline scenario. In the long-run, the average annual level of GDP is between $4.1 and $7.6 billion less than in the baseline scenario.

Employment is affected by the decline in GDP. In the short-term, average annual employment falls by between 27,000 and 51,000 relative to baseline scenario levels. Despite the continued

[142] A set of tables describing the macroeconomic impacts across Canada in more detail is provided in Appendix B.
[143] The Canada Alone scenario excludes changes to international economic activity.

weakness of GDP, the average annual long-run impact on employment is almost zero for all three shock scenarios relative to the baseline. While employment losses are relatively low in the long-run, average real wages are permanently reduced by between $242 and $463 a year relative to baseline scenario levels. This important result is discussed in more detail later in this section.

Another important effect of the change in China's ME status is felt in investment spending which, in the short-term, declines between 0.4 and 0.8% relative to the baseline: a decline that is far larger than the 0.2 to 0.4% drop in GDP. The average annual percentage decline in investment continues to significantly outstrip the fall in GDP even in the long-run.

Figure VI-6 to Figure VI-8 provide a summary of the impacts on select key economic measures for each shock scenario relative to the baseline over both the short-term and the long-run.

Figure VI-6. Impact of China's NME Status on the Economy: Summary

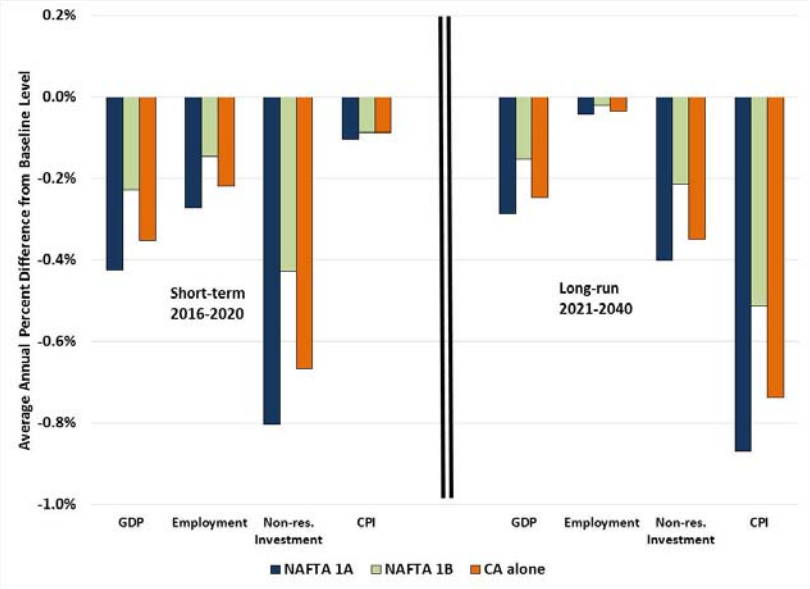


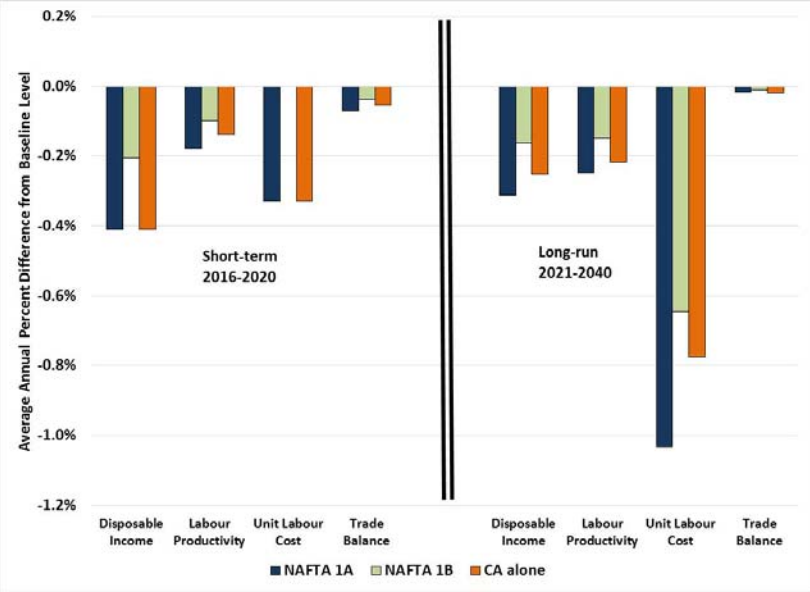
Figure VI-6 repeats the percent difference from the baseline levels information for GDP, employment and non-residential fixed investment from Table VI-1. It also includes the impact on the level of the CPI relative to the baseline. In the short-term, the CPI is driven slightly lower than in the baseline scenario but the decline becomes considerably larger in the long-run. The impact on prices in the C_4SE's model is quite different to that generated by GTAP (see Figure VI-2 and Figure VI-4). This is because GTAP generates changes in the price of one commodity relative to another but, without the concept of time, cannot examine the impact on inflation.

The impact on a set of prosperity and competitiveness measures is shown in Figure VI-7. The average annual percent decline, relative to the baseline, in real per capita disposable income is between 0.2 and 0.4% in the short-term and 0.2 and 0.3% in the long-run. Average annual labour

productivity (output per hour worked) is also lower, relative to the baseline but is worse in the long-run than in the short-term.

Unit labour costs measure the value of labour, in nominal dollars, required to produce a unit of real output and are often used to assess competitiveness. Higher unit labour costs make it harder for goods and services produced in a region to compete against imports from other regions or to find export opportunities in those markets. Lower wages reduce unit labour costs in all shock scenarios particularly in the long-run.[144] Shifts in competitiveness help prevent the trade balance from declining further following the loss of steel sector exports and the associated increase in imports.

Figure VI-7. Prosperity and Competitiveness Impacts



The impact on government revenues and deficits[145] in billions of 2014 dollars is summarized in Figure VI-8. In the short-term, average annual revenues of the federal and provincial governments are between $1.3 and $2.3 billion less than in the baseline scenario while their combined deficits are between $1.1 and $2.1 billion higher. The long-run average annual drop in

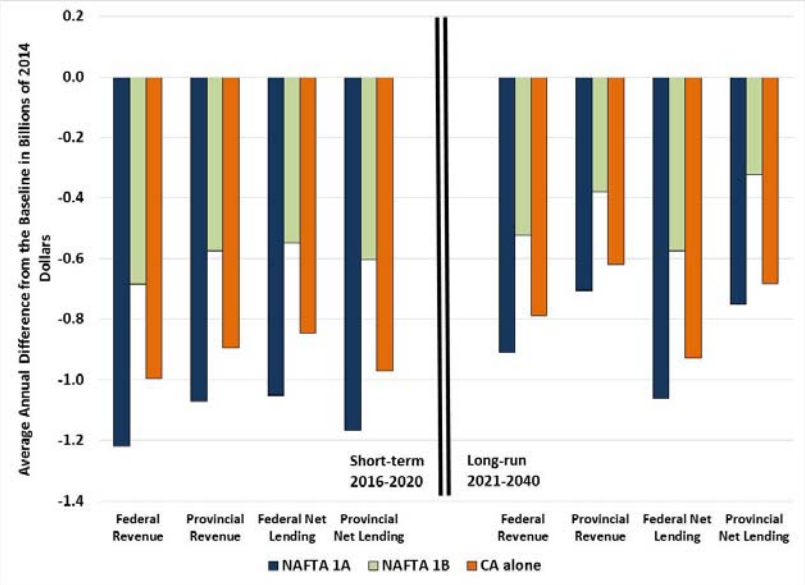
[144] It is important to note that real wages - wages after inflation - are lower in both the short-term and long-run for all three scenarios relative to the baseline. A decline in productivity leads to lower real wages and a reduced standard of living.

[145] The change in a government deficit is the opposite of the change in net lending; so a decrease in a government's net lending means that its deficit has increased.

government revenues is between $0.9 and $1.6 billion while their deficits are between $0.9 and $1.8 billion a year higher than in the baseline scenario.

Some provincial governments do, however, experience an increase in revenue relative to their baseline scenario levels. This occurs in Alberta, Newfoundland and Labrador and Prince Edward Island and is the result of several factors. Provinces without a steel industry experience little or no decline in output or, therefore, revenue while prices of steel and other products fall. As a result, government revenue expressed in inflation adjusted terms rises because there is less inflation to erode their value. Although Alberta has a steel sector, a large share of its government revenue is derived from natural resources which are unaffected by the change in China's ME status. Its revenues are, therefore, affected to a lesser extent than provinces which rely on income and sales taxes and are, when adjusted for lower inflation, higher than the levels in the baseline scenario.

Figure VI-8. Government Fiscal Impacts



The next section examines the results on a year-by-year basis so as to provide the reader with a better understanding of the dynamic properties of the C_4SE's provincial economic modeling system. This is followed by an examination of the impacts by industry sector and then by province.

1. Dynamic Impacts

For ease of exposition, most of the results of this analysis have been presented either in terms of the impacts over the short-term (2016-2020) or as an average of long-term (2020-2040) impacts. The C_4SE's provincial economic modeling system does, however, produce results for each year of the analysis. The annual results are presented in this section to help the reader understand the

evolution of the economy in response a change in China's ME status, and to help illustrate different ways of interpreting impact analysis.

Figure VI-9 displays the year-by-year impact on real GDP growth in Canada over the projection period. Real GDP growth falls sharply in 2016 when the change in China's ME status is introduced and remains weaker for the next two years before rebounding and growing marginally faster than in the baseline scenario for a few years. Real GDP growth in each of the shock scenarios is very similar to the baseline after the first decade with the difference being very close to zero. Some differences in growth rates between the shock scenarios can be observed with real GDP growth in the NAFTA1A and CA alone scenarios being similar for the first couple of years before the CA alone starts to more closely match the NAFTA1B scenario impacts.

Figure VI-9. Impact of China's NME Status on Real GDP Growth in Canada

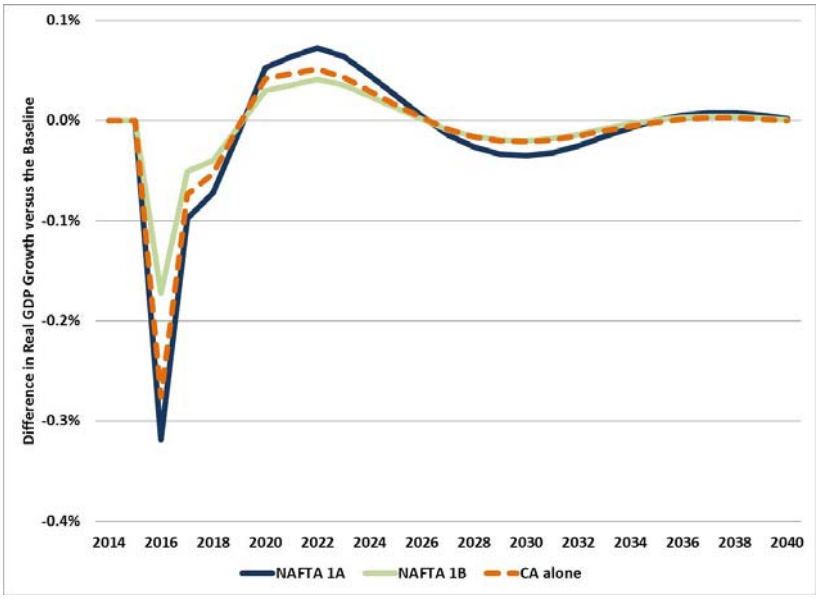
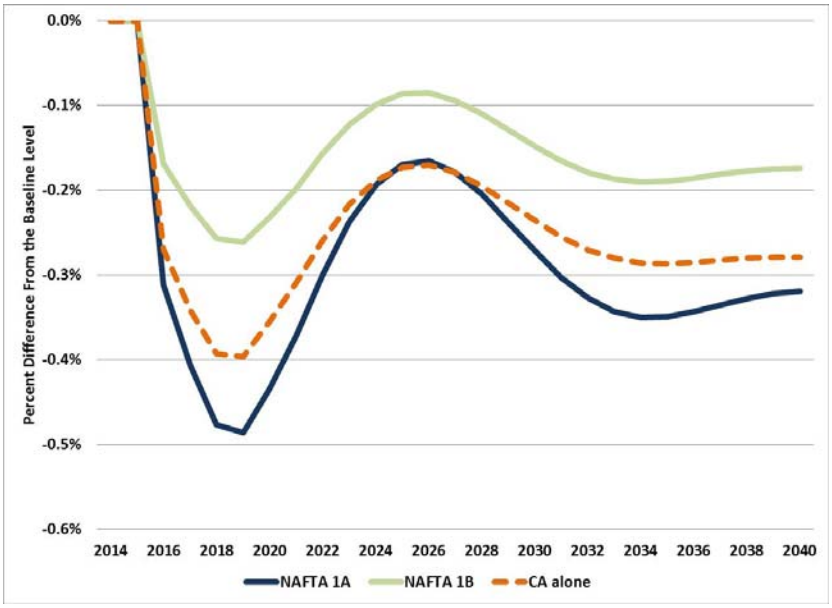
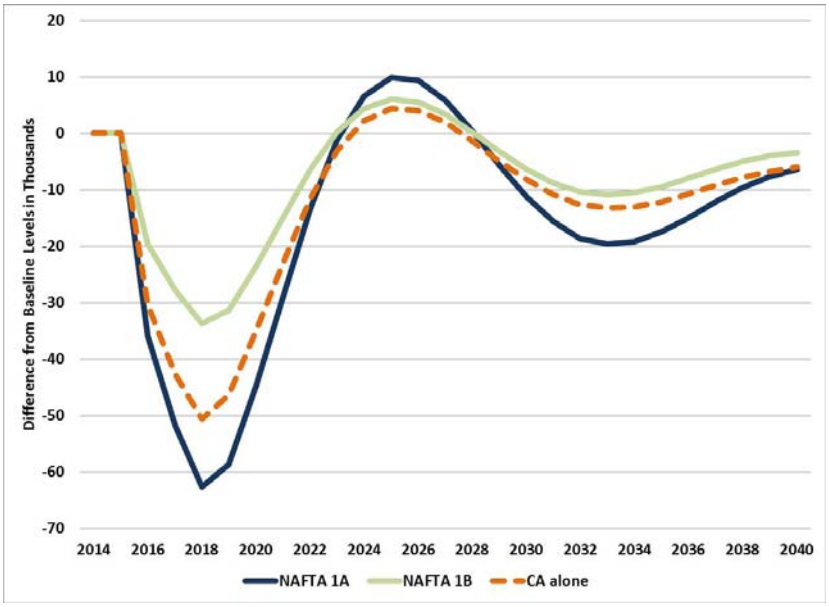


Figure VI-10. Impact of China's NME Status on Real GDP in Canada



The differences in real GDP growth rates shown in Figure VI-10 lead to the percentage differences in real GDP from the baseline scenario shown in Figure VI-11. The drop in real GDP in the NAFTA1A scenario peaks at almost -0.5% ($10.7 billion) in 2018-19, rebounds to 0.2% ($4.1 billion) below the baseline in 2025-27 before approaching a permanent, long-run level that is just over 0.3% below the level in the baseline scenario or $9.7 billion lower in 2040. The impact on real GDP in CA alone scenario is almost as severe with the near-term loss peaking at 0.4% and the permanent, long-term loss approaching 0.3% below the level in the baseline scenario. The impact on real GDP in the NAFTA1B scenario is similar in shape to the other scenarios but is less severe with a permanent, long-term loss of nearly 0.2% compared to the levels in the baseline scenario. Despite the temporary increase in real GDP growth seen in Figure VI-9, the level of real GDP is permanently below the level in the baseline in all shock scenarios.

Figure VI-11. Impact of China's NME Status on Employment in Canada

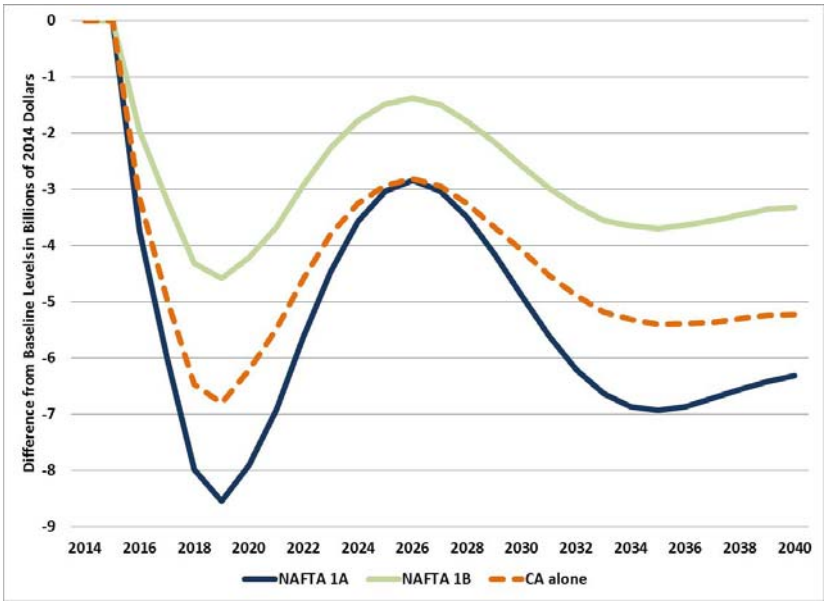


The economic cycle seen in Figure VI-10 is caused by the adjustment of the economy to changes in wages and prices arising from the loss of steel industry production and the lower cost of imports following a change in China's ME status. This cycle has implications for employment. Figure VI-11 shows that the impact on employment in Canada broadly echoes the impact on GDP seen in Figure VI-10. The change in China's ME status reduces employment by over 60,000 persons in 2018 in the NAFTA1A scenario relative to the baseline or by just over 30,000 in the NAFTA1B scenario. The long-term impact on employment is quite similar across the three shock scenarios after 2020. Employment levels in all three shock scenarios are a little higher the baseline for a few years (2024-27) before falling permanently below the baseline for the remainder of the projection period.

The long-run impact on employment is very low: between 3 and 6 thousand below the baseline in 2040. The impact on labour income, however, persists as shown in Figure VI-12. In the last few years of the simulation, labour income is reduced by between $3.5 and $6.5 billion from baseline levels (measured in 2014 dollars) while in the short-term the peak loss is between $4.6 and $8.6 billion. The permanent loss of labour income combined with a relatively minor decline in long-term employment implies that average income or wages have fallen in response to China's change in ME status.

The C_4SE's provincial economic modeling system assumes that wage rates adjust to return unemployment rates to their "natural" rate.[146] At the end of the projection period, wage rates – and productivity – will differ across the scenarios reflecting the differences in GDP shown in Figure VI-10. Figure VI-13 shows the impact on average annual wages (adjusted for inflation). The peak decline in short-term, average annual wages is between $150 and $280 (measured in 2014 dollars). While there is a limited recovery in wage rates over the next few years their reduction in the long-run matches their peak short-term decline. With workers earning less, businesses substitute labour for capital and investment falls (see Table VI-1).

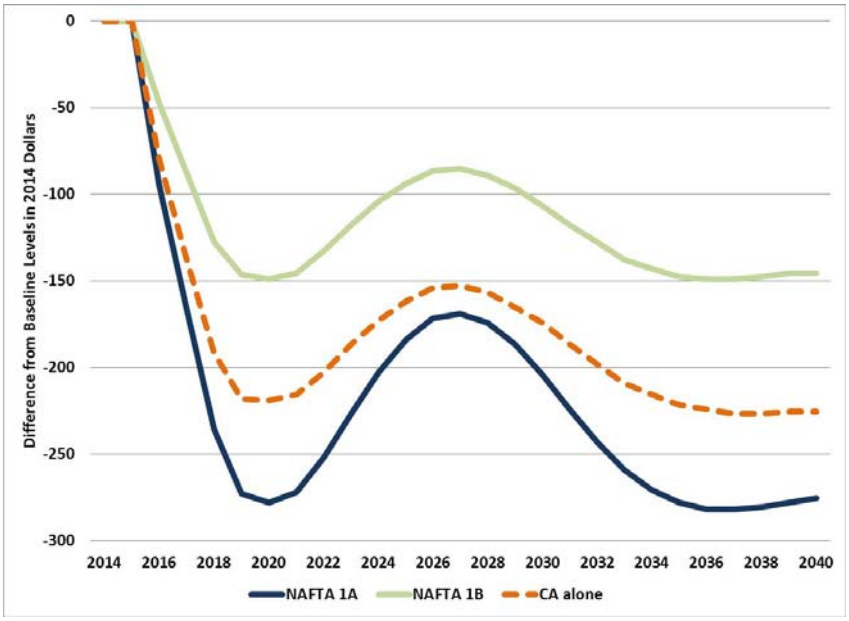
Figure VI-12. Impact of China's NME Status on Labour Income in Canada



The reader should note that this describes the average wage loss across all workers. The losses experienced by some workers will be likely be far greater than those of others. Displaced steel workers will likely struggle to replace their income even after retraining. That said, the impact on wage rates is likely to be impact many other workers throughout the economy as lower investment across all sectors makes labour less productive. When labour is less productive it is worth less to an employer and is, therefore, paid less.

[146] The C_4SE's provincial economic modeling system ensures that the unemployment rate returns, over time, to its "natural rate." (The "natural unemployment rate" excludes unemployment due to cyclical activity in the economy.) This adjustment process involves not only changes in the wage rate, but also in labour migration as people move to regions with better employment opportunities. This process has several consequences for the economy. First, the change in wages required to help move the unemployment rate back to its natural rate is reduced when labour is mobile. Second, changes in population arising from labour migration introduce economic cycles into the model's results as new residential housing, business investment and even public sector spending adjust to reflect higher, or lower, population levels.

Figure VI-13. Impact of China's NME Status on Average Annual Real Wages in Canada



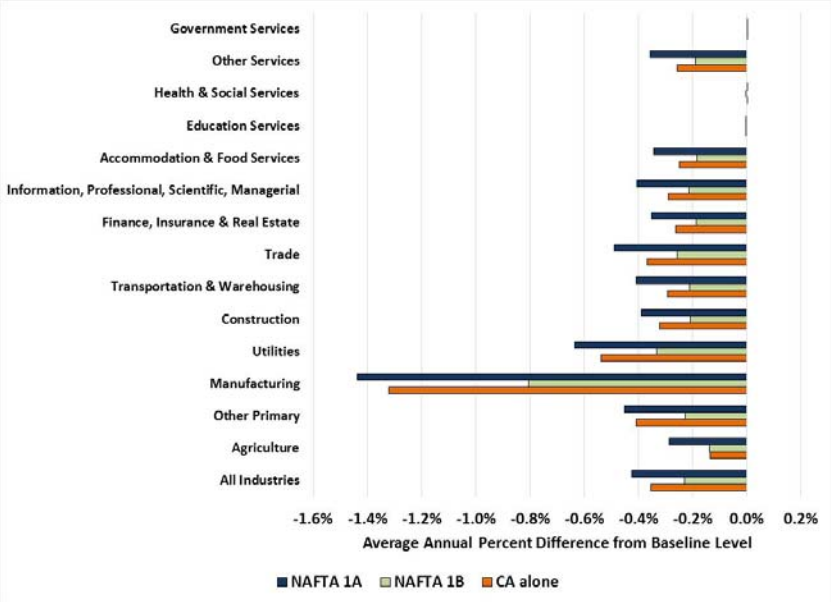
2. Industry Impacts

The impacts by industry are shown in Figure VI-14 and Figure VI-15. Figure VI-14 shows the average annual percent difference for each of the shock scenarios compared with the baseline over the short-term (2016-2020), while Figure VI-15 shows the impact over the balance of the projection period.

The manufacturing sector suffers the brunt of the impact over the short-term with output falling between $1.8 and $3.3 billion on average a year representing about 40% of the overall change in GDP. The other 60% of the total change is spread across all other business-sector industries.

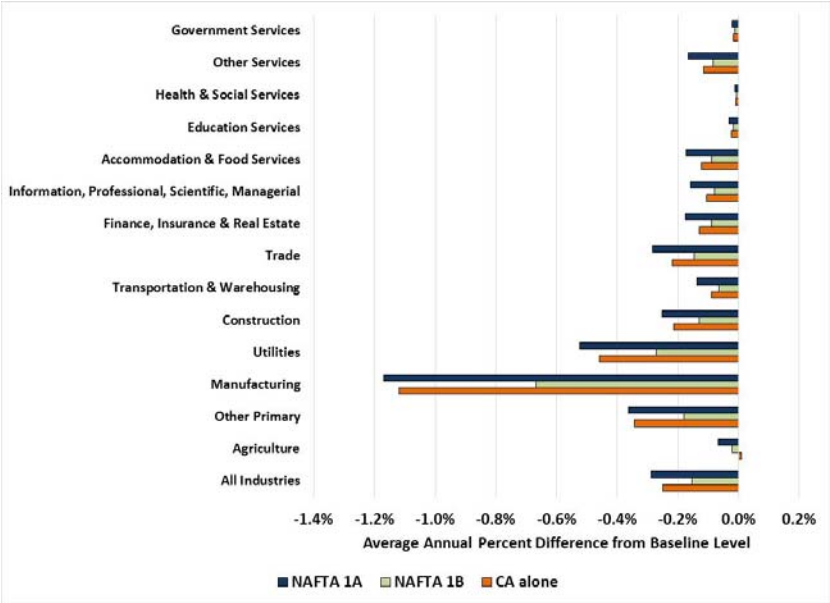
In the NAFTA1A scenario, manufacturing sector output is down by over 1.4% from the baseline level while the losses to other business sectors are limited to about 0.5% below the baseline and are near zero for the public-sector industries. The losses across industries in the NAFTA1B scenario are about half those of the NAFTA1A scenario but follow a similar pattern while the sectoral losses in the CA alone scenario are similar to those of the NAFTA1A scenario.

Figure VI-14. Impact on Real GDP by Industry: Short-term



Over the long-run, average annual percent changes in real GDP relative to the baseline follow a similar pattern to that seen in the short-run. The average annual decline in the manufacturing sector is between $1.9 and $3.4 billion and now accounts for about half of the total loss. The remainder of the decline is spread across other business sectors while losses for public sector industries remain very small.

Figure VI-15. Impact on Real GDP by Industry: Long-run



a) Focus on Manufacturing

This study has restricted the direct impact of a change in China's ME status to the steel industry. As discussed, the impact is felt most keenly by the manufacturing sector. This section focuses on the manufacturing sector showing the annual losses to employment in Figure VI-16 and to output in Figure VI-17. Manufacturing sector's employment peak decline of between 14 and 25 thousand, about 40% of the total decline. In the long-run, employment is permanently reduced by between 8 and 14 thousand which is over twice the 3 to 6 thousand reduction for the whole economy. The change in China's ME status promotes a shift in employment away from manufacturing and towards the service sector as that sector hires more, lower cost, workers.

Figure VI-16. Impact of China's NME Status on Manufacturing Employment in Canada

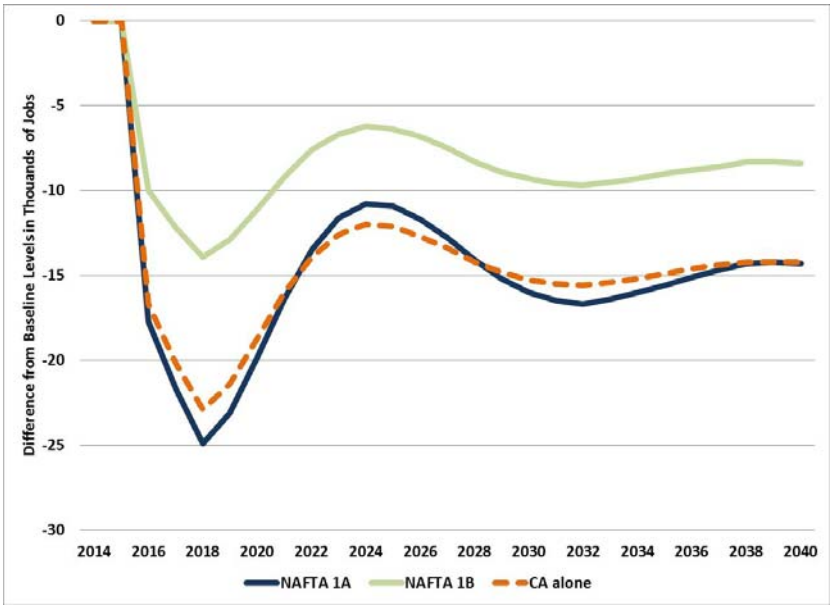
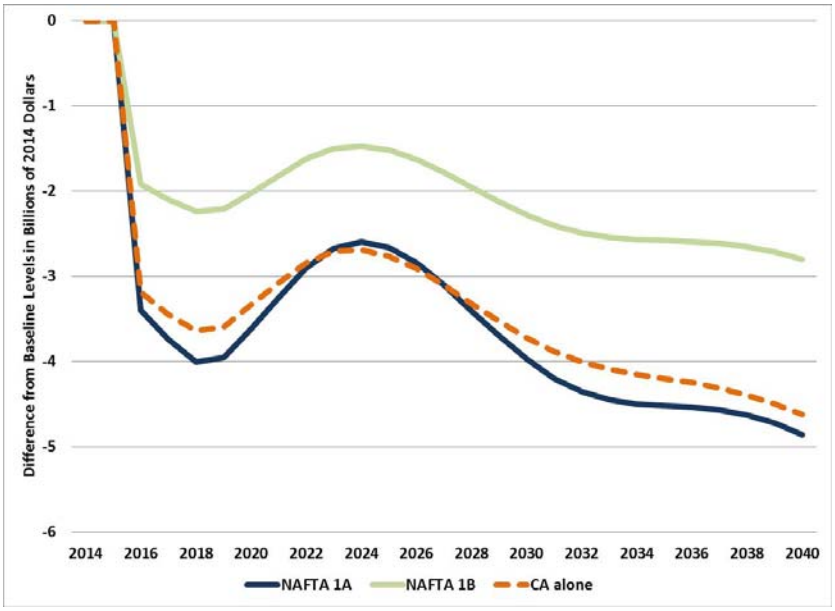


Figure VI-17 provides the annual impacts to manufacturing sector output, measured in billions of 2014 dollars, that is summarized in the short-term by Figure VI-14 and the long-run by Figure VI-15 as the percent difference to the baseline. Manufacturing sector output continues to fall relative to the baseline scenario even though employment has stabilized at a new, lower level. This reflects the additional loss to the economy from the foregone productivity gain in the manufacturing sector.

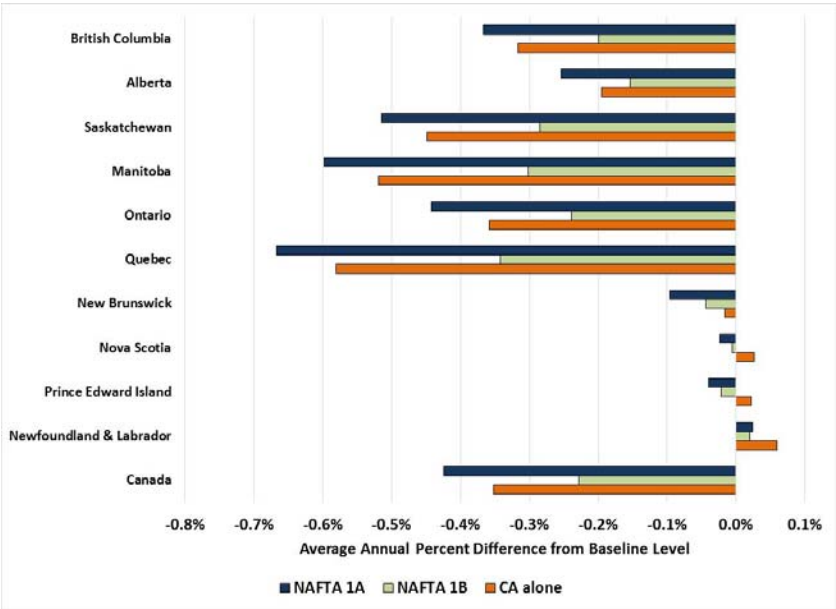
Figure VI-17. Impact of China's NME Status on Manufacturing Output (GDP) in Canada



3. Regional Impacts

The impacts both nationally by province are shown in Figure VI-18 and Figure VI-19 which show the average annual percent difference from the baseline for each of the scenarios for the short-term and the long-run, respectively.

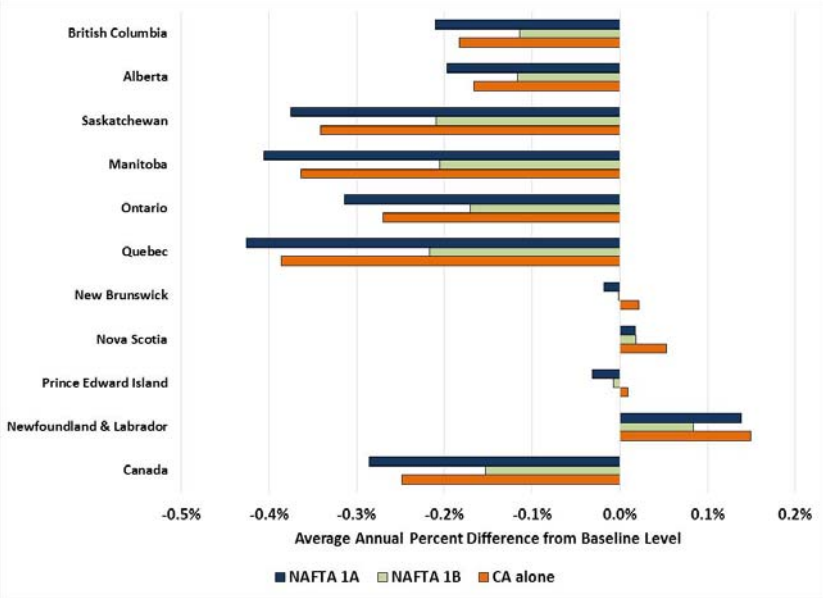
Figure VI-18. Impact on Real GDP by Province: Short-term



As may be expected, the impacts are largest for the provinces that primary metal and metal fabricating industries. These industries are present, in varying degrees, in all provinces outside of Atlantic Canada. Although Ontario has the most steel industry workers, the impact of changing China's ME status in this province is smaller, as a share of the economy, than for Quebec, Manitoba and Saskatchewan. The small gain in output in Newfoundland and Labrador arises because the labour market in that provinces appears better, relative to the rest of the nation, which encourages people to stay in the province. This leads to a small, population-based boom in which household spending and residential investment rise encouraging business investment and employment growth.

In the short-term, Ontario's GDP is between $1.9 and $3.5 billion a year less a year on average than in the baseline scenario. Quebec is down between $1.4 and $2.7 billion, Alberta between $0.6 and $1.0 billion, British Columbia between $0.5 and $1.0 billion, Saskatchewan between $0.3 and $0.5 billion and Manitoba between $0.2 and $0.4 billion.

Figure VI-19. Impact on Real GDP by Province: Long-run



Over the long-run, the impact on average annual GDP follows a similar pattern as seen in the short-term although the population-led boom in Newfoundland and Labrador has led to a more significant increase in that province's economy ($40 to $60 million). Ontario's economy is between $1.7 and $3.1 billion a year less a year on average than in the baseline scenario. Quebec is down between $1.1 and $2.2 billion, Alberta between $0.6 and $1.0 billion, British Columbia between $0.4 and $0.7 billion, Saskatchewan between $0.2 and $0.4 billion and Manitoba between $0.2 and $0.3 billion.

D. Summary and Observations

The inputs for the modeling exercise using the C_4SE's provincial economic modeling system were designed to be consistent with the assumptions and results from CapTrade's modeling with GTAP. The results confirm and reinforce CapTrade's findings. In the long-run, the C_4SE estimates that real GDP in Canada will be between 0.2 and 0.3% below the baseline scenario level while CapTrade estimated the decline to be between zero and 0.1%. The slight difference in results reflects the different nature of the two models, but both agree that Canada's economy would be permanently reduced if China's ME status is changed.

While the long-run impacts to the Canadian economy are relatively small, losses during the period that the economy adjusts to the decline of the domestic steel industry are significantly larger: up to 60,000 fewer jobs with a loss of about 0.5% of GDP. The costs of this adjustment process are not captured by CGE models like GTAP but can be several times larger than the long-run impact and have real and long-lasting consequences for households and governments. At a minimum, governments face reduced tax revenues as the tax base shrinks and increased spending as automatic stabilizers such as Employment Insurance kick in. Households must deal with the consequences of loss of income, possible long-term unemployment, under-employment or the possible need for retraining.

Predictably, changing China's ME status acts to accelerate the decline of Canada's manufacturing sector with the losses felt most keenly in Quebec, Ontario, Manitoba, Saskatchewan and Alberta. The policy change also leads to a permanent reduction in labour income of between $3.5 and $6.5 billion from baseline levels (measured in 2014 dollars) while in the short-term the peak loss is between $4.6 and $8.6 billion. As a result, real wages (wages after inflation) decline between 0.2 and 0.3% relative to levels in the baseline scenario as labour productivity is between 0.1 and 0.2% lower than in the baseline. The weaker economy also has implications for federal and provincial finances: lower revenues and higher deficits or smaller surpluses.

An interesting extension to this analysis demonstrates the benefits of policy coordination. The economic outcome for Canada changing China's ME status while the United States and Mexico do not is almost as bad as the outcome from the scenario in which all three NAFTA countries agree to change it. Any benefit to acting alone accrues to the nation(s) that decide to extend China's NME status. The best outcome is for all three NAFTA countries to extend China's NME status.

1. Limitations of the Analysis

The analysis only considers the change in anti-dumping duties to steel products from China. It ignores the potential direct impact on other industries that will be similarly affected by a change in China's ME status: industries that will have to compete against other products that are also no longer protected by anti-dumping duties.

CTI's SIM 2 showed that the impact on Canada is more extreme if the impact of changing

China's ME status on other sectors is included: three times higher than those reported for SIM 1A. The results from this analysis, therefore, likely understate the actual costs to the Canadian economy of this policy decision.

The analysis assumes that all other nations outside North America decide to extend China's NME status for the duration of the projection period.

Expanding the number of countries that change China's ME status will likely increase the number of countries that experience a decline in their economies, particularly in the short-term. This downturn could be reinforced and amplified by weaker trade between countries as they all experience a decline in demand at the same time.

And, the shocks assume that China's steel industry continues to sell steel on international markets at below market prices throughout the projection period.

China may decide to reform its industry so as to earn a positive rate of return and reduce its cost of subsidizing foreign consumption. If, however, the steel industry in other countries has shut down then the cost of rebuilding such a capital intensive industry may be too high for those countries to re-establish their industries. Of course, any Chinese reform would raise the price of steel for all consumers; contributing to imported inflation as Chinese subsidies no longer flow to consumers around the world.

We are now left with the question: what will be the impact of changing China's ME status on the Canadian economy and is it captured by this research? This study has used a scenario approach to try and capture the uncertainty surrounding the likely impact. As discussed earlier, the trade elasticity between domestic and foreign steel in the NAFTA1a scenario has been raised - but has not been raised by enough to replicate actual trade history. There is significant risk that this scenario *understates* the impact on the economy. The range of outcomes between NAFTA1a and NAFTA1b is intended to cover the range of most likely impacts and the lower bound impact when just the steel industry is considered. The decision to grant China ME status will, however, not just affect the steel industry. Other sectors of the Canadian economy will be similarly affected and, as seen in CapTrade's SIM 2, the impact on the Canadian economy is likely to be more severe than portrayed in this analysis and could approach or exceed 1% of GDP. For these reasons, we consider these results to be conservative and to likely represent an optimistic view of the economic impacts arising from a decision to change China's ME status.

Granting China ME status before it completes reforms to its economy will damage the Canadian economy: leading to lower output, wages, productivity and tax revenue. While these impacts persist in the long-run, they are more severe in the short-term. Canada must act in conjunction with its NAFTA trade partners to encourage the Chinese government to continue its reform – and reduce the cost of subsidies and other supports borne by its citizens. Only when the reforms have been completed should the NAFTA countries recognize China as a market economy.

E. Appendix A: C_4SE Provincial Economic Modeling System

The C_4SE's Provincial Modeling System is a dynamic, multi-sector, regional economic model of the country. It includes a bottom-up set of macroeconomic models for the provinces, the territories and the rest of the world. The national model links economic activity in one region with activity in the other regions through trade. The provincial models include detailed income and expenditure categories and demographic and labour market information. The purpose of the modeling system is to produce medium- to long-term projections of the provincial economies and conduct simulation studies that require industry and demographic detail.

This modelling system consists of a set of provincial and territorial macroeconomic models that are linked through trade, financial markets and interprovincial migration. The impact on the supply chain – in terms of output and employment – is fully captured by the multi-sector model, which incorporates the purchasing patterns from the current input-output tables. But, unlike an input-output model, a dynamic macroeconomic model also considers the impact on suppliers' investment decisions.

The model produces impacts on employment, labour income, value added output, productivity, investment and exports for at least fourteen industry sectors (see list below). It also produces the impacts on government revenue by level of government and source of revenue. The dynamic nature of the model, however, makes it more challenging to develop a single summary measure that provides a "rule-of-thumb" result. The need for such a measure is satisfied by generating an average impact over several years of the simulation or, when appropriate, a return on investment statistic.

C_4SE Model – Industry Sectors

Agriculture	Finance, Insurance & Real Estate
Other Primary (detail varies by province)	Professional, Scientific & Management Services
Manufacturing (detail varies by province)	Accommodation & Food
Construction	Health Services
Utilities	Other Services
Transportation & Warehousing	Education Services
Wholesale & Retail Trade	Government Services

The model incorporates partial policy responses to economic developments. In terms of monetary policy, the Bank of Canada adjusts interest rates using a Taylor Rule reaction function that responds to inflation relative to its target rate and the unemployment rate relative to the natural rate of unemployment. The exchange rate reacts to Canada-US interest rate differentials and changes in the purchasing power parity value of the dollar. In terms of fiscal policy, government spending is, for many categories, a function of population, while government revenue reacts to changes in the tax base.

The following sections provide the reader with more information on the structure of the individual provincial models and the national model that unites the provincial and territorial models.

a) Provincial Models

The provincial and territorial models are very similar in structure – the parameters in each model differ to reflect differences in the economic experience of each region.

The provincial models are similar in nature to a general equilibrium model, but full product and factor substitution is not implemented. At present, substitution is restricted to the energy products and value-added. For purposes of manageability, there is only one wage rate and one set of cost of capital measures – construction and equipment – in the model. Changes in these measures of labour and capital costs cause labour and capital intensities to change across all sectors of the economy.

The model's economy is organized into four broad sectors. Firms employ capital and labour to produce a profit-maximizing output under a Cobb-Douglas constant-returns-to-scale technology. Households consume the domestic and foreign products and supply labour under the assumption of utility maximization. Governments purchase the domestic and foreign products and produce output. Foreigners purchase the domestic product and supply the foreign product.

There are two main markets in the model. These markets correspond to the domestic and foreign products and the labour market. Each of these markets is concerned with the determination of demands, supplies, and prices. Like most sub-national models, the provincial models assume that most prices are set in national markets. The presence of the National model in the system means that interest rates, exchange rates and the price of some goods and services are affected by changes in economic activity in each province.

In sub-national economies, the movement of labour is a key factor in the adjustment of the local economy to changes in economic conditions. The C_4SE's model allows net migration – and therefore the total population – to adjust over time to reflect changes in economic conditions. If the economy and employment is growing, then the demand for labour rises and net migration rises. This feature is an important consideration when examining economic impacts over one or more decades.

b) National Model

The design of the national model is what makes the C_4SE's system unique. The national block adds up the economic activity across the country and uses this information to help determine prices, interest rates, exchange rates and the rest-of-country external demand for goods and services – all factors that are exogenous to the other provincial modelling systems.

To see why this is important, consider an increase in one province's economy. This raises that province's demand for imports. In this system, each of the other provinces sees an increase in

demand for their exports to that province which, in turn, raises their own economies. The increase in economic activity will put upward pressure on prices, interest rates and the exchange rate. The entire national economy therefore adjusts over time to the initial shock.

c) Summary of C$_4$SE Winter 2014-15 Outlook

The Provincial Economic Modeling System models and forecasts that were used in this analysis were released in January, 2015. The outlook is summarized in the following two tables. The outlook incorporates lower prices for oil and other commodities plus weaker economic growth for Canada's key trading partners. The slump in oil prices slows economic growth in Alberta, Saskatchewan, and Newfoundland and Labrador this year. Economic growth is expected to pick up again for the last few years of the decade but then slows – driven by demographic changes – over the long-term.

Table VI-2. C4SE Economic Outlook: Winter 2014-15

	2015	2016	2017	2018	2019	2020	Average 2016-20	Average 2021-40
GDP Growth by Province:								
Canada	1.9%	2.3%	2.4%	2.6%	2.1%	1.8%	2.2%	1.5%
Newfoundland & Labrador	1.0%	1.6%	0.7%	5.4%	2.2%	2.4%	2.4%	0.1%
Prince Edward Island	1.9%	2.9%	2.8%	2.1%	2.2%	1.6%	2.3%	1.3%
Nova Scotia	1.6%	2.4%	2.3%	2.0%	1.4%	1.0%	1.8%	0.6%
New Brunswick	1.3%	2.1%	2.5%	2.2%	1.5%	1.6%	2.0%	0.8%
Quebec	1.6%	1.9%	2.7%	2.7%	2.1%	1.7%	2.2%	1.7%
Ontario	2.7%	2.4%	2.3%	2.3%	1.7%	1.6%	2.0%	1.6%
Manitoba	2.5%	3.6%	2.0%	1.4%	1.5%	1.3%	2.0%	1.6%
Saskatchewan	1.4%	2.7%	2.1%	2.2%	1.3%	0.3%	1.7%	0.9%
Alberta	0.6%	1.5%	1.7%	2.5%	2.9%	2.5%	2.2%	1.5%
British Columbia	2.4%	3.2%	3.6%	3.9%	2.8%	2.1%	3.1%	1.7%
Employment Growth by Province:								
Canada	0.9%	1.2%	1.4%	1.5%	1.0%	0.7%	1.1%	0.6%
Newfoundland & Labrador	-0.9%	0.8%	-0.9%	0.8%	0.7%	1.3%	0.6%	0.2%
Prince Edward Island	1.2%	2.1%	2.1%	1.3%	1.1%	0.5%	1.4%	0.3%
Nova Scotia	0.8%	1.1%	1.3%	0.8%	0.2%	-0.3%	0.6%	-0.6%
New Brunswick	0.3%	1.0%	1.4%	1.2%	0.5%	0.2%	0.9%	-0.4%
Quebec	0.6%	0.7%	1.5%	1.4%	0.7%	0.4%	0.9%	0.6%
Ontario	1.0%	1.1%	1.1%	1.2%	0.6%	0.5%	0.9%	0.5%
Manitoba	0.9%	1.9%	1.6%	1.2%	0.9%	0.7%	1.3%	0.8%
Saskatchewan	0.7%	1.6%	1.3%	1.5%	0.6%	-0.1%	1.0%	0.4%
Alberta	0.6%	1.2%	1.4%	2.1%	2.1%	1.8%	1.7%	0.9%
British Columbia	1.5%	2.1%	2.2%	2.2%	1.8%	1.0%	1.9%	0.6%
Employment Growth by Industry:								
Agriculture	1.3%	-0.7%	0.2%	0.0%	-0.4%	-0.8%	-0.3%	-0.8%
Other Primary	0.7%	-0.4%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%	-0.8%
Manufacturing	1.2%	1.4%	1.6%	1.2%	0.0%	-0.9%	0.7%	-0.9%
Utilities	-0.3%	0.8%	1.5%	1.2%	0.9%	0.5%	1.0%	0.3%
Construction	-0.8%	1.3%	0.7%	1.8%	1.1%	1.0%	1.2%	-0.4%
Transportation & Warehousing	1.8%	1.6%	1.6%	1.5%	0.8%	0.1%	1.1%	0.2%
Wholesale & Retail Trade	0.7%	0.9%	1.5%	1.7%	1.1%	0.7%	1.2%	0.4%
Finance, Insurance & Real Estate	1.2%	1.2%	1.3%	1.4%	0.8%	0.5%	1.0%	0.4%
Information & Professional Services	1.0%	1.6%	1.7%	1.8%	1.0%	0.5%	1.3%	0.3%
Accommodation & Food Services	1.1%	1.3%	1.6%	1.5%	0.8%	0.6%	1.2%	0.5%
Education Services	-0.7%	-0.8%	-0.3%	-0.2%	0.1%	0.4%	-0.2%	1.1%
Health & Social Services	2.1%	2.2%	2.5%	2.4%	2.5%	2.5%	2.4%	2.2%
Other Services	1.1%	1.4%	1.6%	1.6%	1.0%	0.6%	1.2%	0.4%
Government Services	0.3%	0.7%	0.9%	1.0%	1.1%	1.2%	1.0%	1.2%

Table VI-3. C4SE Outlook: Winter 2014-15

	percent change unless otherwise noted							
	2015	2016	2017	2018	2019	2020	Average 2016-20	Average 2021-40
Economic Performance								
Real per capita GDP	0.8%	1.2%	1.2%	1.4%	1.0%	0.8%	1.1%	0.8%
Real per capita Disposable Income	0.7%	0.7%	1.0%	1.0%	1.0%	1.4%	1.0%	1.1%
Labour Productivity	1.0%	1.1%	1.0%	1.1%	1.1%	1.1%	1.1%	1.0%
Demographics, Labour & Housing								
Population	1.1%	1.1%	1.1%	1.1%	1.1%	1.2%	1.1%	0.7%
Net Immigration (thousands)	247	262	269	280	293	313	283	264
Unemployment Rate	7.0	6.8	6.5	6.1	5.9	6.0	6.3	5.6
Housing Starts (thousands)	195	200	204	213	217	222	211	163
External & Government Balances								
Real Trade Balance ($2007 billions)	-14	0	18	22	21	19	16	17
Nominal Trade Balance ($ billions)	-47	-29	0	13	12	8	1	15
Federal Net Lending ($ billions)	-10	-7	-6	-2	-1	-1	-4	-1
Provincial Net Lending ($ billions)	-35	-27	-22	-17	-17	-18	-20	-40
Wages & Prices								
Consumer Price Index	1.5%	2.4%	1.8%	2.0%	1.8%	1.9%	2.0%	2.2%
Wage Rate	2.5%	3.0%	3.1%	3.4%	3.1%	2.9%	3.1%	2.9%
Unit Labour Costs	0.0%	1.8%	3.4%	1.7%	1.6%	1.6%	2.0%	2.0%
Financial Markets								
3-Month T-Bill Rate	1.15	2.30	3.25	3.68	3.98	3.75	3.39	4.16
10-Year GOC Bond Rate	3.05	4.10	4.55	4.58	4.98	5.15	4.67	5.84
Exchange Rate (US cents per CAD)	85.2	85.5	85.6	86.1	86.2	86.1	85.9	87.4

F. Appendix B: Scenario Results

The following tables provide a summary of the economic and fiscal impacts for each scenario (for selected time periods) compared to the baseline scenario.

1. NAFTA1A Scenario

The NAFTA1A scenario is based on CapTrade's SIM1A in which the Armington elasticity of substitution between domestic and imported steel is raised to the average of the Primary-Mining sector in the GTAP model so as to better reflect the likely long-run impact on the steel industry in North America.

Table VI-4. Impact of China's NME Status Scenario on Selected Indicators: NAFTA 1A Scenario

% difference from baseline, except where indicated	Average Annual 2016-20	Average Annual 2021-40
Economic Performance		
Real per capita GDP	-0.4%	-0.3%
Real per capita Disposable Income	-0.4%	-0.3%
Labour Productivity	-0.2%	-0.2%
Demographics, Labour & Housing		
Population (difference in thousands)	-0.9	-10.1
Net Immigration (difference in thousands)	-1.1	-0.3
Unemployment Rate (difference)	0.1	0.0
Housing Starts (difference in thousands)	-0.1	-0.2
External Balances		
Real Trade Balance (difference in $2014 millions)	-1596	-498
Nominal Trade Balance (difference in $ millions)	-1843	-2801
Government Balances		
Federal Budget Balance (difference in $ millions)	-1181	-1583
Provincial Budget Balance (difference in $ millions)	-1188	-635
Combined Budget Balance (difference in $ millions)	-2369	-2218
Wages & Prices		
Consumer Price Index	-0.1%	-0.9%
Wage Rate	-0.5%	-1.2%
Unit Labour Costs	-0.3%	-1.0%
Financial Markets		
3-Month T-Bill Rate (difference in basis points)	-5	-3
10-Year GOC Bond Rate (difference in basis points)	-3	-2
Exchange Rate (difference in US cents)	0	0

Table VI-5. Impact of China's NME Status Scenario on GDP and Employment by Province & Industry Sector: NAFTA 1A Scenario

	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
GDP Impact by Province (millions of 2014 dollars):				
Canada	-9,117	-7,602	-0.4%	-0.3%
Newfoundland & Labrador	9	61	0.0%	0.1%
Prince Edward Island	-3	-3	0.0%	0.0%
Nova Scotia	-11	8	0.0%	0.0%
New Brunswick	-34	-7	-0.1%	0.0%
Quebec	-2,735	-2,189	-0.7%	-0.4%
Ontario	-3,486	-3,061	-0.4%	-0.3%
Manitoba	-417	-349	-0.6%	-0.4%
Saskatchewan	-476	-390	-0.5%	-0.4%
Alberta	-992	-970	-0.3%	-0.2%
British Columbia	-999	-732	-0.4%	-0.2%
Employment Impact by Province (thousands):				
Canada	-50.8	-8.5	-0.3%	0.0%
Newfoundland & Labrador	0.1	0.6	0.1%	0.2%
Prince Edward Island	0.0	0.0	0.0%	0.0%
Nova Scotia	0.0	0.4	0.0%	0.1%
New Brunswick	-0.2	0.1	-0.1%	0.0%
Quebec	-18.9	-5.2	-0.5%	-0.1%
Ontario	-18.6	-4.2	-0.3%	-0.1%
Manitoba	-2.0	-0.5	-0.3%	-0.1%
Saskatchewan	-2.1	-0.7	-0.4%	-0.1%
Alberta	-3.5	0.4	-0.1%	0.0%
British Columbia	-5.6	0.5	-0.2%	0.0%
Employment Impact by Industry (thousands):				
Agriculture	-0.6	0.1	-0.2%	0.1%
Other Primary	-2.0	-1.5	-0.6%	-0.4%
Manufacturing	-21.4	-14.3	-1.2%	-0.9%
Utilities	-0.8	-0.6	-0.5%	-0.4%
Construction	-2.9	0.4	-0.2%	0.0%
Transportation & Warehousing	-2.2	1.3	-0.2%	0.1%
Wholesale & Retail Trade	-8.6	-0.2	-0.3%	0.0%
Finance, Insurance & Real Estate	-2.4	0.6	-0.2%	0.0%
Information & Professional Services	-4.7	3.6	-0.2%	0.2%
Accommodation & Food Services	-1.8	1.9	-0.1%	0.1%
Education Services	0.0	-0.5	0.0%	0.0%
Health & Social Services	0.0	-0.5	0.0%	0.0%
Other Services	-3.2	1.5	-0.2%	0.1%
Government Services	0.0	-0.3	0.0%	0.0%

Table VI-6. Impact of China's NME Status Scenario on Public and Private Investment by Province & industry Sector: NAFTA 1A Scenario

Millions of 2014 Dollars	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Public & Private Non-residential Investment Spending				
Canada	-2,897	-1,745	-0.8%	-0.4%
Newfoundland & Labrador	0	5	0.0%	0.1%
Prince Edward Island	-2	-2	-0.2%	-0.1%
Nova Scotia	-12	-8	-0.2%	-0.1%
New Brunswick	-12	-4	-0.2%	-0.1%
Quebec	-882	-514	-1.4%	-0.6%
Ontario	-980	-595	-1.0%	-0.5%
Manitoba	-148	-84	-1.2%	-0.6%
Saskatchewan	-236	-147	-1.0%	-0.6%
Alberta	-326	-236	-0.4%	-0.2%
British Columbia	-298	-164	-0.6%	-0.3%
Investment Spending by Type & Industry Sector				
Total	-2,897	-1,745	-0.8%	-0.4%
Non-res Construction	-1,128	-642	-0.6%	-0.3%
Engineering Construction	-693	-380	-0.6%	-0.3%
Building Construction	-436	-262	-0.7%	-0.3%
Machinery & Equipment	-1,215	-740	-1.0%	-0.5%
Intellectual Property	-554	-363	-0.9%	-0.5%
Agriculture	-78	-34	-1.1%	-0.4%
Other Primary	-396	-253	-0.5%	-0.3%
Manufacturing	-772	-554	-2.4%	-1.3%
Utilities	-551	-294	-1.7%	-0.8%
Construction	-52	-38	-0.7%	-0.4%
Transportation & Warehousing	-206	-69	-0.7%	-0.2%
Trade	-221	-111	-1.0%	-0.4%
Finance, Insurance & Real Estate	-314	-169	-0.9%	-0.4%
Information, Professional, Scientific, Managerial	-100	-84	-0.5%	-0.3%
Accommodation & Food Services	-43	-14	-0.9%	-0.2%
Education Services	1	-9	0.0%	0.0%
Health & Social Services	0	-3	0.0%	0.0%
Other Services	-167	-96	-0.7%	-0.3%
Government Services	2	-16	0.0%	0.0%

Table VI-7. Impact of China's NME Status Scenario on Government Revenues and Deficits: NAFTA 1A Scenario

Millions of 2014 Dollars / Share of GDP	Difference from the Baseline		Change in Share of GDP from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Government Revenues				
Federal Governments	-1,218	-909	-0.01	-0.01
Provincial Governments	-1,070	-705	0.02	0.01
Newfoundland & Labrador	7	27	0.01	0.01
Prince Edward Island	2	3	0.04	0.04
Nova Scotia	5	-13	0.02	-0.03
New Brunswick	-7	-13	0.03	-0.01
Quebec	-464	-302	0.05	0.04
Ontario	-392	-307	0.02	0.02
Manitoba	-55	-111	0.09	0.00
Saskatchewan	-29	-44	0.02	-0.02
Alberta	41	167	0.02	0.03
British Columbia	-126	-69	0.01	0.01
Government Deficits				
Federal Governments	1,053	1,063	0.05	0.04
Provincial Governments	1,167	750	0.06	0.03
Newfoundland & Labrador	0	-14	0.00	-0.03
Prince Edward Island	-1	-3	-0.02	-0.04
Nova Scotia	1	27	0.00	0.05
New Brunswick	5	14	0.01	0.03
Quebec	476	665	0.11	0.13
Ontario	340	67	0.06	0.02
Manitoba	63	114	0.08	0.11
Saskatchewan	32	31	0.03	0.02
Alberta	-5	-391	0.00	-0.08
British Columbia	137	176	0.05	0.05

Table VI-8. Impact of China's NME Status Scenario on Government Revenues by Revenue Source: NAFTA 1A Scenario

Millions of 2014 Dollars	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Federal Government Revenue				
Total	-1,218	-909	-0.4%	-0.3%
Direct Taxes - Persons	-600	-403	-0.4%	-0.2%
Direct Taxes - Business	-228	-209	-0.7%	-0.5%
Contributions to Social Insurance	-129	-83	-0.6%	-0.3%
Direct Taxes - Non-Residents	-43	-33	-0.5%	-0.3%
Indirect Taxes	-183	-159	-0.3%	-0.2%
Other Personal Transfers	-1	0	-0.4%	-0.2%
Investment Income	-35	-23	-0.3%	-0.2%
CPP				
Contributions to Social Insurance	-338	-220	-0.6%	-0.3%
Investment Income	-397	-3,687	-2.5%	-6.9%
Aggregate Provincial Government Revenue				
Total	-1,070	-705	-0.3%	-0.2%
Direct Taxes - Persons	-405	-291	-0.4%	-0.3%
Direct Taxes - Business	-154	-137	-0.6%	-0.4%
Contributions to Social Insurance	-67	-45	-0.5%	-0.3%
Indirect Taxes	-430	-293	-0.4%	-0.2%
Other Personal Transfers	-67	-48	-0.4%	-0.2%
Investment Income	-42	-15	-0.1%	0.0%

2. NAFTA1B Scenario

The NAFTA1B scenario is based on CapTrade's SIM1B in which the Armington elasticity of substitution between domestic and imported steel is reduced to the average of the Primary-Mining and Steel Using sectors in the GTAP model. This scenario addresses the risk that the adjustment to the Armington elasticity of substitution in the SIM1A scenario is too large.

Table VI-9. Impact of China's NME Status Scenario on Selected Indicators: NAFTA 1B Scenario

% difference from baseline, except where indicated	Average Annual 2016-20	Average Annual 2021-40
Economic Performance		
Real per capita GDP	-0.2%	-0.1%
Real per capita Disposable Income	-0.2%	-0.2%
Labour Productivity	-0.1%	-0.1%
Demographics, Labour & Housing		
Population (difference in thousands)	-0.7	-5.4
Net Immigration (difference in thousands)	-0.7	-0.1
Unemployment Rate (difference)	0.1	0.0
Housing Starts (difference in thousands)	-0.1	-0.1
External Balances		
Real Trade Balance (difference in $2014 millions)	-861	-337
Nominal Trade Balance (difference in $ millions)	-1008	-1644
Government Balances		
Federal Budget Balance (difference in $ millions)	-616	-860
Provincial Budget Balance (difference in $ millions)	-612	-215
Combined Budget Balance (difference in $ millions)	-1228	-1075
Wages & Prices		
Consumer Price Index	-0.1%	-0.5%
Wage Rate	-0.3%	-0.7%
Unit Labour Costs	0.0%	-0.6%
Financial Markets		
3-Month T-Bill Rate (difference in basis points)	-3	-2
10-Year GOC Bond Rate (difference in basis points)	-2	-1
Exchange Rate (difference in US cents)	0	0

Table VI-10. Impact of China's NME Status Scenario on GDP and Employment by Province & Industry Sector: NAFTA 1B Scenario

	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
GDP Impact by Province (millions of 2014 dollars):				
Canada	-4,902	-4,080	-0.2%	-0.2%
Newfoundland & Labrador	8	37	0.0%	0.1%
Prince Edward Island	-1	-1	0.0%	0.0%
Nova Scotia	-3	9	0.0%	0.0%
New Brunswick	-16	-1	0.0%	0.0%
Quebec	-1,403	-1,116	-0.3%	-0.2%
Ontario	-1,888	-1,663	-0.2%	-0.2%
Manitoba	-210	-176	-0.3%	-0.2%
Saskatchewan	-264	-217	-0.3%	-0.2%
Alberta	-602	-574	-0.2%	-0.1%
British Columbia	-543	-397	-0.2%	-0.1%
Employment Impact by Province (thousands):				
Canada	-27.2	-4.4	-0.1%	0.0%
Newfoundland & Labrador	0.1	0.3	0.0%	0.1%
Prince Edward Island	0.0	0.0	0.0%	0.0%
Nova Scotia	0.0	0.3	0.0%	0.1%
New Brunswick	-0.1	0.1	0.0%	0.0%
Quebec	-9.7	-2.6	-0.2%	-0.1%
Ontario	-10.1	-2.2	-0.1%	0.0%
Manitoba	-1.0	-0.2	-0.2%	0.0%
Saskatchewan	-1.2	-0.4	-0.2%	-0.1%
Alberta	-2.2	0.1	-0.1%	0.0%
British Columbia	-3.1	0.3	-0.1%	0.0%
Employment Impact by Industry (thousands):				
Agriculture	-0.3	0.1	-0.1%	0.0%
Other Primary	-1.0	-0.8	-0.3%	-0.2%
Manufacturing	-12.0	-8.3	-0.7%	-0.5%
Utilities	-0.4	-0.3	-0.2%	-0.2%
Construction	-1.5	0.3	-0.1%	0.0%
Transportation & Warehousing	-1.1	0.8	-0.1%	0.1%
Wholesale & Retail Trade	-4.4	0.1	-0.2%	0.0%
Finance, Insurance & Real Estate	-1.3	0.3	-0.1%	0.0%
Information & Professional Services	-2.4	2.1	-0.1%	0.1%
Accommodation & Food Services	-0.9	1.0	-0.1%	0.1%
Education Services	0.0	-0.3	0.0%	0.0%
Health & Social Services	0.0	-0.2	0.0%	0.0%
Other Services	-1.7	0.9	-0.1%	0.1%
Government Services	0.0	-0.1	0.0%	0.0%

Table VI-11. Impact of China's NME Status Scenario on Public and Private Investment by Province & Industry Sector: NAFTA 1B Scenario

Millions of 2014 Dollars	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Public & Private Non-residential Investment Spending				
Canada	-1,543	-927	-0.4%	-0.2%
Newfoundland & Labrador	1	4	0.0%	0.0%
Prince Edward Island	-1	-1	-0.1%	-0.1%
Nova Scotia	-5	-3	-0.1%	0.0%
New Brunswick	-6	-1	-0.1%	0.0%
Quebec	-449	-261	-0.7%	-0.3%
Ontario	-528	-321	-0.5%	-0.3%
Manitoba	-74	-42	-0.6%	-0.3%
Saskatchewan	-130	-81	-0.6%	-0.4%
Alberta	-192	-134	-0.2%	-0.1%
British Columbia	-160	-88	-0.3%	-0.2%
Investment Spending by Type & Industry Sector				
Total	-1,543	-927	-0.4%	-0.2%
Non-res Construction	-593	-335	-0.3%	-0.2%
Engineering Construction	-359	-196	-0.3%	-0.2%
Building Construction	-234	-139	-0.4%	-0.2%
Machinery & Equipment	-654	-398	-0.6%	-0.3%
Intellectual Property	-296	-194	-0.5%	-0.2%
Agriculture	-40	-17	-0.6%	-0.2%
Other Primary	-198	-126	-0.2%	-0.1%
Manufacturing	-430	-314	-1.3%	-0.8%
Utilities	-290	-155	-0.9%	-0.4%
Construction	-28	-20	-0.4%	-0.2%
Transportation & Warehousing	-108	-35	-0.4%	-0.1%
Trade	-116	-57	-0.5%	-0.2%
Finance, Insurance & Real Estate	-169	-88	-0.5%	-0.2%
Information, Professional, Scientific, Managerial	-53	-43	-0.3%	-0.2%
Accommodation & Food Services	-23	-7	-0.5%	-0.1%
Education Services	0	-5	0.0%	0.0%
Health & Social Services	0	-1	0.0%	0.0%
Other Services	-89	-50	-0.4%	-0.2%
Government Services	1	-9	0.0%	0.0%

Table VI-12. Impact of China's NME Status Scenario on Government Revenues and Deficits: NAFTA 1B Scenario

Millions of 2014 Dollars / Share of GDP	Difference from the Baseline		Change in Share of GDP from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Government Revenues				
Federal Governments	-684	-523	0.00	0.00
Provincial Governments	-575	-382	0.01	0.01
Newfoundland & Labrador	4	15	0.00	0.00
Prince Edward Island	1	2	0.02	0.02
Nova Scotia	3	-8	0.01	-0.02
New Brunswick	-4	-8	0.02	0.00
Quebec	-242	-158	0.02	0.02
Ontario	-217	-171	0.01	0.01
Manitoba	-28	-60	0.05	0.00
Saskatchewan	-16	-24	0.01	-0.01
Alberta	21	91	0.01	0.01
British Columbia	-69	-39	0.01	0.00
Government Deficits				
Federal Governments	549	574	0.03	0.02
Provincial Governments	603	321	0.03	0.01
Newfoundland & Labrador	0	-9	0.00	-0.02
Prince Edward Island	-1	-1	-0.01	-0.02
Nova Scotia	0	15	0.00	0.03
New Brunswick	2	8	0.01	0.02
Quebec	244	343	0.06	0.07
Ontario	182	24	0.03	0.01
Manitoba	32	62	0.04	0.06
Saskatchewan	17	16	0.01	0.01
Alberta	-6	-241	0.00	-0.05
British Columbia	74	96	0.03	0.03

Table VI-13. Impact of China's NME Status Scenario on Government Revenues by Revenue Source: NAFTA 1B Scenario

Millions of 2014 Dollars	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Federal Government Revenue				
Total	-684	-523	-0.2%	-0.2%
Direct Taxes - Persons	-335	-223	-0.2%	-0.1%
Direct Taxes - Business	-128	-126	-0.4%	-0.3%
Contributions to Social Insurance	-70	-44	-0.3%	-0.2%
Direct Taxes - Non-Residents	-24	-20	-0.3%	-0.2%
Indirect Taxes	-109	-97	-0.2%	-0.1%
Other Personal Transfers	0	0	-0.2%	-0.1%
Investment Income	-19	-13	-0.2%	-0.1%
CPP				
Contributions to Social Insurance	-183	-118	-0.3%	-0.2%
Investment Income	-236	-2,083	-1.5%	-3.9%
Aggregate Provincial Government Revenue				
Total	-575	-382	-0.2%	-0.1%
Direct Taxes - Persons	-222	-157	-0.2%	-0.1%
Direct Taxes - Business	-86	-83	-0.4%	-0.3%
Contributions to Social Insurance	-36	-24	-0.3%	-0.1%
Indirect Taxes	-229	-153	-0.2%	-0.1%
Other Personal Transfers	-37	-26	-0.2%	-0.1%
Investment Income	-16	-2	0.0%	0.0%

3. Canada Alone Scenario

The Canada Alone scenario assumes that, of the three NAFTA countries, only Canada changes China's ME status in 2016. The United States and Mexico both continue to treat China as a NME. The change in Canada's steel industry is based on CapTrade's SIM1A in which the Armington elasticity of substitution between domestic and imported steel is raised to the average of the Primary-Mining sector in the GTAP model so as to better reflect the likely long-run impact on the steel industry in North America.

Table VI-14. Impact of China's NME Status Scenario on Selected Indicators: Canada alone changes NME status Scenario

% difference from baseline, except where indicated	Average Annual 2016-20	Average Annual 2021-40
Economic Performance		
Real per capita GDP	-0.4%	-0.2%
Real per capita Disposable Income	-0.4%	-0.3%
Labour Productivity	-0.1%	-0.2%
Demographics, Labour & Housing		
Population (difference in thousands)	-0.7	-8.2
Net Immigration (difference in thousands)	-0.9	-0.2
Unemployment Rate (difference)	0.1	0.0
Housing Starts (difference in thousands)	-0.1	-0.2
External Balances		
Real Trade Balance (difference in $2014 millions)	-1479	-653
Nominal Trade Balance (difference in $ millions)	-1453	-2638
Government Balances		
Federal Budget Balance (difference in $ millions)	-948	-1381
Provincial Budget Balance (difference in $ millions)	-989	-604
Combined Budget Balance (difference in $ millions)	-1937	-1984
Wages & Prices		
Consumer Price Index	-0.1%	-0.7%
Wage Rate	-0.4%	-1.0%
Unit Labour Costs	-0.3%	-0.8%
Financial Markets		
3-Month T-Bill Rate (difference in basis points)	-4	-2
10-Year GOC Bond Rate (difference in basis points)	-3	-2
Exchange Rate (difference in US cents)	0	0

Table VI-15. Impact of China's NME Status Scenario on GDP and Employment by Province & Industry Sector: Canada alone changes NME status Scenario

	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
GDP Impact by Province (millions of 2014 dollars):				
Canada	-7,560	-6,611	-0.4%	-0.2%
Newfoundland & Labrador	23	65	0.1%	0.1%
Prince Edward Island	1	1	0.0%	0.0%
Nova Scotia	11	26	0.0%	0.1%
New Brunswick	-6	9	0.0%	0.0%
Quebec	-2,381	-1,985	-0.6%	-0.4%
Ontario	-2,828	-2,631	-0.4%	-0.3%
Manitoba	-362	-312	-0.5%	-0.4%
Saskatchewan	-415	-354	-0.4%	-0.3%
Alberta	-762	-819	-0.2%	-0.2%
British Columbia	-861	-636	-0.3%	-0.2%
Employment Impact by Province (thousands):				
Canada	-41.0	-7.1	-0.2%	0.0%
Newfoundland & Labrador	0.2	0.5	0.1%	0.2%
Prince Edward Island	0.1	0.1	0.1%	0.1%
Nova Scotia	0.2	0.5	0.0%	0.1%
New Brunswick	0.0	0.1	0.0%	0.0%
Quebec	-16.2	-4.6	-0.4%	-0.1%
Ontario	-14.6	-3.5	-0.2%	0.0%
Manitoba	-1.6	-0.4	-0.2%	-0.1%
Saskatchewan	-1.8	-0.7	-0.3%	-0.1%
Alberta	-2.4	0.4	-0.1%	0.0%
British Columbia	-4.8	0.4	-0.2%	0.0%
Employment Impact by Industry (thousands):				
Agriculture	-0.2	0.3	-0.1%	0.1%
Other Primary	-1.8	-1.5	-0.5%	-0.4%
Manufacturing	-20.0	-14.3	-1.1%	-0.9%
Utilities	-0.6	-0.6	-0.4%	-0.3%
Construction	-2.5	0.3	-0.2%	0.0%
Transportation & Warehousing	-1.5	1.4	-0.2%	0.1%
Wholesale & Retail Trade	-6.3	0.4	-0.2%	0.0%
Finance, Insurance & Real Estate	-1.7	0.7	-0.1%	0.1%
Information & Professional Services	-3.0	3.7	-0.1%	0.2%
Accommodation & Food Services	-1.1	1.9	-0.1%	0.1%
Education Services	0.0	-0.4	0.0%	0.0%
Health & Social Services	0.0	-0.4	0.0%	0.0%
Other Services	-2.2	1.7	-0.1%	0.1%
Government Services	0.0	-0.2	0.0%	0.0%

Table VI-16. Impact of China's NME Status Scenario on Public and Private Investment by Province & Industry Sector: Canada alone changes NME status Scenario

Millions of 2014 Dollars	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Public & Private Non-residential Investment Spending				
Canada	-2,404	-1,517	-0.7%	-0.3%
Newfoundland & Labrador	5	7	0.1%	0.1%
Prince Edward Island	0	-1	0.0%	-0.1%
Nova Scotia	-2	-2	0.0%	0.0%
New Brunswick	-2	1	0.0%	0.0%
Quebec	-769	-466	-1.2%	-0.6%
Ontario	-798	-514	-0.8%	-0.4%
Manitoba	-127	-75	-1.0%	-0.6%
Saskatchewan	-205	-132	-0.9%	-0.6%
Alberta	-248	-197	-0.3%	-0.2%
British Columbia	-256	-140	-0.5%	-0.3%
Investment Spending by Type & Industry Sector				
Total	-2,404	-1,517	-0.7%	-0.3%
Non-res Construction	-935	-556	-0.5%	-0.3%
Engineering Construction	-585	-335	-0.5%	-0.3%
Building Construction	-350	-221	-0.6%	-0.3%
Machinery & Equipment	-1,000	-640	-0.8%	-0.4%
Intellectual Property	-470	-321	-0.8%	-0.4%
Agriculture	-50	-24	-0.7%	-0.3%
Other Primary	-357	-240	-0.4%	-0.3%
Manufacturing	-703	-523	-2.2%	-1.3%
Utilities	-462	-253	-1.4%	-0.7%
Construction	-43	-32	-0.6%	-0.4%
Transportation & Warehousing	-151	-51	-0.5%	-0.2%
Trade	-169	-88	-0.8%	-0.3%
Finance, Insurance & Real Estate	-240	-133	-0.7%	-0.3%
Information, Professional, Scientific, Managerial	-77	-67	-0.4%	-0.3%
Accommodation & Food Services	-33	-11	-0.7%	-0.2%
Education Services	1	-7	0.0%	0.0%
Health & Social Services	0	-2	0.0%	0.0%
Other Services	-124	-74	-0.6%	-0.2%
Government Services	2	-13	0.0%	0.0%

Table VI-17. Impact of China's NME Status Scenario on Government Revenues and Deficits: Canada alone changes NME status Scenario

Millions of 2014 Dollars / Share of GDP	Difference from the Baseline		Change in Share of GDP from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Government Revenues				
Federal Governments	-995	-787	0.00	0.00
Provincial Governments	-895	-620	0.02	0.01
Newfoundland & Labrador	6	24	0.00	0.00
Prince Edward Island	2	4	0.03	0.03
Nova Scotia	8	-6	0.01	-0.03
New Brunswick	-4	-11	0.02	-0.01
Quebec	-402	-273	0.04	0.03
Ontario	-318	-263	0.02	0.02
Manitoba	-49	-100	0.08	0.00
Saskatchewan	-26	-41	0.02	-0.01
Alberta	41	142	0.01	0.02
British Columbia	-108	-58	0.01	0.01
Government Deficits				
Federal Governments	846	927	0.04	0.03
Provincial Governments	970	682	0.05	0.03
Newfoundland & Labrador	0	-12	0.00	-0.03
Prince Edward Island	-2	-3	-0.02	-0.04
Nova Scotia	-3	19	-0.01	0.04
New Brunswick	2	12	0.01	0.03
Quebec	411	595	0.10	0.12
Ontario	273	62	0.05	0.01
Manitoba	56	102	0.07	0.10
Saskatchewan	27	28	0.02	0.02
Alberta	-10	-334	0.00	-0.07
British Columbia	115	149	0.05	0.04

Table VI-18. Impact of China's NME Status Scenario on Government Revenues by Revenue Source: Canada alone changes NME status Scenario

Millions of 2014 Dollars	Difference from the Baseline		Percent Difference from the Baseline	
	Average Annual 2016-20	Average Annual 2021-40	Average Annual 2016-20	Average Annual 2021-40
Federal Government Revenue				
Total	-995	-787	-0.4%	-0.2%
Direct Taxes - Persons	-486	-334	-0.3%	-0.2%
Direct Taxes - Business	-188	-198	-0.5%	-0.4%
Contributions to Social Insurance	-105	-68	-0.5%	-0.2%
Direct Taxes - Non-Residents	-36	-32	-0.4%	-0.3%
Indirect Taxes	-153	-135	-0.3%	-0.2%
Other Personal Transfers	0	0	-0.4%	-0.2%
Investment Income	-28	-20	-0.3%	-0.2%
CPP				
Contributions to Social Insurance	-275	-183	-0.5%	-0.3%
Investment Income	-330	-3,090	-2.1%	-5.8%
Aggregate Provincial Government Revenue				
Total	-895	-620	-0.2%	-0.1%
Direct Taxes - Persons	-333	-243	-0.4%	-0.2%
Direct Taxes - Business	-126	-130	-0.5%	-0.4%
Contributions to Social Insurance	-55	-39	-0.4%	-0.2%
Indirect Taxes	-361	-249	-0.3%	-0.2%
Other Personal Transfers	-56	-41	-0.4%	-0.2%
Investment Income	-39	-22	-0.1%	0.0%