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Economics Still Trumps Politics Between Japan and China¹

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Background

Japan and China today share the third largest trading relationship globally. While they are economically interdependent to a large degree, they also have a complicated political relationship that stems from unresolved history. There is little systematic evidence of political differences affecting trade and investment in recent times. This paper will explain why that has been the case until now and measure whether the period of heightened political tensions in 2012 have affected trade thus far.

There have been a number of recent instances of political tension between Japan and China. For example, when Koizumi was Prime Minister of Japan between 2001 and 2006, leadership visits between Japan and China were temporarily suspended. Then in 2005, we saw large-scale anti-Japanese protests in China that included attempts at boycotting Japanese products. In 2010 there were increased tensions surrounding the Japanese arrest of a Chinese trawler captain. There have also been a range of other episodes of political tensions. The important point is that these political tensions do not appear to have had a significant effect on economic relations between Japan and China. Bilateral and regional trade, as well as Japanese investment into China, has grown in spite of these tensions. Any adverse impact on trade or investment from the fraught politics between 2001 and 2011 is difficult to find beyond anecdotal evidence.

The tensions that were precipitated by the territorial dispute over the Senkaku/Diaoyu Islands in 2012 arguably represent the most serious widening of political distance between the two countries in recent memory. In September 2012, the Japanese government purchased some of the islands from private owners to circumvent their sale to a nationalist group. The object of the purchase was to avoid the creation of further tension with China. The nationalisation of the islands by the Japanese government instead had the opposite effect, with the escalation of tensions with China. In China, the acquisition was followed by anti-Japanese protests that were larger and more extensive than those in 2005. The protests resulted in the temporary closure of some Japanese factories and businesses.

Trade in both directions—from Japan to China and from China to Japan—has grown rapidly since the beginning of the Chinese reform period in 1978 when the two countries signed the Long Term Trade Agreement and economic relations were normalised. Trade grew from just over US\$5 billion in 1978 to over US\$342 billion in 2013.² Japanese investment in China increased together with expanded trade. Importantly, the large volume of Japanese investment in China has been a key factor in enabling Japanese manufacturers to remain competitive. The offshoring of Japanese production to China and the rest of Asia, and China's role as the location for final assembly of the parts and components traded in East Asia have meant that the bilateral relationship is a major driver of

² Source: UN Comtrade database

East Asian production networks and regional economic integration despite the political differences and tensions.

This paper first discusses why trade and investment between Japan and China has flourished despite historical political tensions. This situation stands in contrast to other bilateral relationships where political differences have had a major flow-on effect on economic relations.³ It then goes on to consider whether there is any evidence to suggest that the most recent escalation of tensions in 2012 had an impact on the bilateral trading relationship. This exercise involves comparing trade in both directions to what we could otherwise expect given what we know about the characteristics of both countries and the fundamental determinants of trade.

The ballast of the global trading system for Sino-Japan ties

In contemporary times, there has not been a significant period in which Japan and China have enjoyed a close political relationship. The existence of a complicated political relationship with unresolved historical issues can increase risk such that traders and investors may instead prefer to trade with or invest in other countries with less cultural or political distance.

In the case of Japan and China, however, bilateral political tensions have not derailed the strong economic relationship that has developed since 1978. In fact, the economic relationship has at times shaped the political relationship by helping to prevent the intensification of political tensions. Tensions did not derail economic relations because of China's commitment to opening its economy and to entering the global trading system. This commitment underpinned the economic relationship and gave both sides confidence in engaging commercially with one another (Armstrong, 2012).

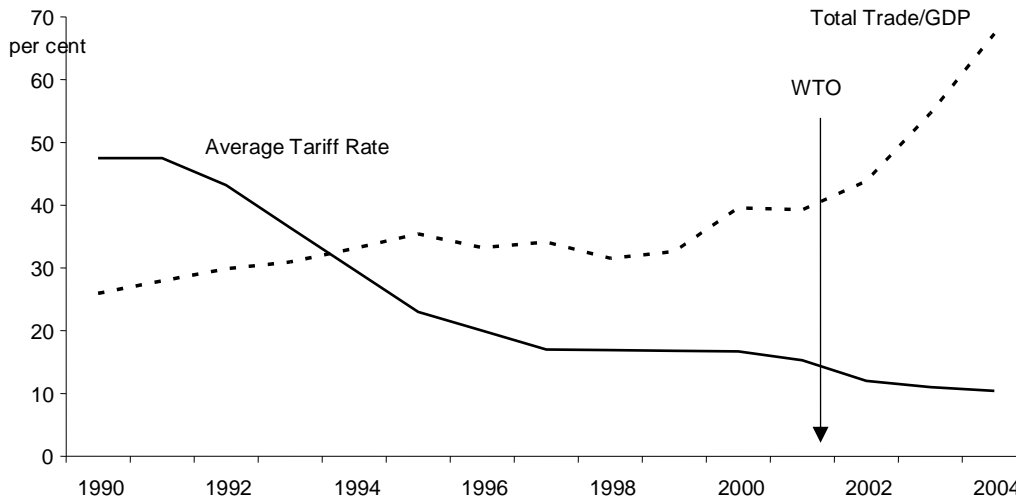
China's commitment to the global trading system through rapid trade liberalisation in the 1990s was aimed at gaining accession to the General Agreement on Tariffs and Trade (GATT), later the World Trade Organisation (WTO). The GATT accession process began in 1986 with major unilateral liberalisations and concurrent domestic reforms. That commitment to liberalisation and reform through the WTO placed constraints on Chinese policymakers and was a deliberate step by Chinese leaders to deepen pro-market reforms and the opening up of the Chinese economy. These constraints, and rapid opening up of the economy, meant that state influence on domestic and foreign companies waned.

China's underlying commitment to GATT, and later to WTO entry, helped to insulate its bilateral relationship with Japan from political tensions. It also meant

³ One pertinent example is the Pakistan-India relationship which, before partition, had free movement of goods, capital and labour, shared the same institutions and had very few barriers, but currently has a relatively non-existent economic relationship dominated by a bad political relationship.

that the two countries' economic relationship constrained and shaped the political relationship.

Figure 1 China's trade dependence and average tariff rate, per cent, 1990-2004



Source: Tariff data from MOFCOM website, <http://china.org.cn>, trade data from UN Comtrade database, and GDP data from *World Development Indicators*, <http://www.worldbank.org/data>.

Figure 1 shows China's average tariff rate and total trade (exports plus imports) as a proportion of GDP, which is a common measure of openness. The figure shows that the most significant tariff reductions did in fact occur in the 1990s, but trade as a proportion of GDP did not rise significantly until around the time of WTO accession in 2001. Significant liberalisation—both at the border and behind the border—took place in the lead up to WTO accession, starting as early as 11 years prior to 2001, but in fact, the rapid increase in China's trade only occurred post WTO accession.

China's WTO accession demonstrated a commitment to continued marketisation and reform, which gave the international economic community and Japanese and other businesses confidence in engaging with China. In this way, economic engagement between Japan and China could be based on the market forces and those characteristics that drive economic relations between countries—proximity of the two countries and their complementary economic structures—in a way that that has insulated against the vagaries of political distance.

There is considerable anecdotal evidence to suggest that recent episodes of political tension between Japan and China have had adverse economic effects. There is also some systematic evidence of this. Fisman et al (2013) measure the impact of political events (resulting in widened political distance) in 2005 and 2010 on the sales and share prices of Japanese and Chinese firms with high exposure to the other country. During those periods of heightened political tension, they find that the Japanese firms that are adversely affected are those

with high exposure to Chinese industries in China in which state owned enterprises are dominant. In the case of Chinese firms, the entities that are disproportionately affected are those that sell directly to the Japanese consumer.

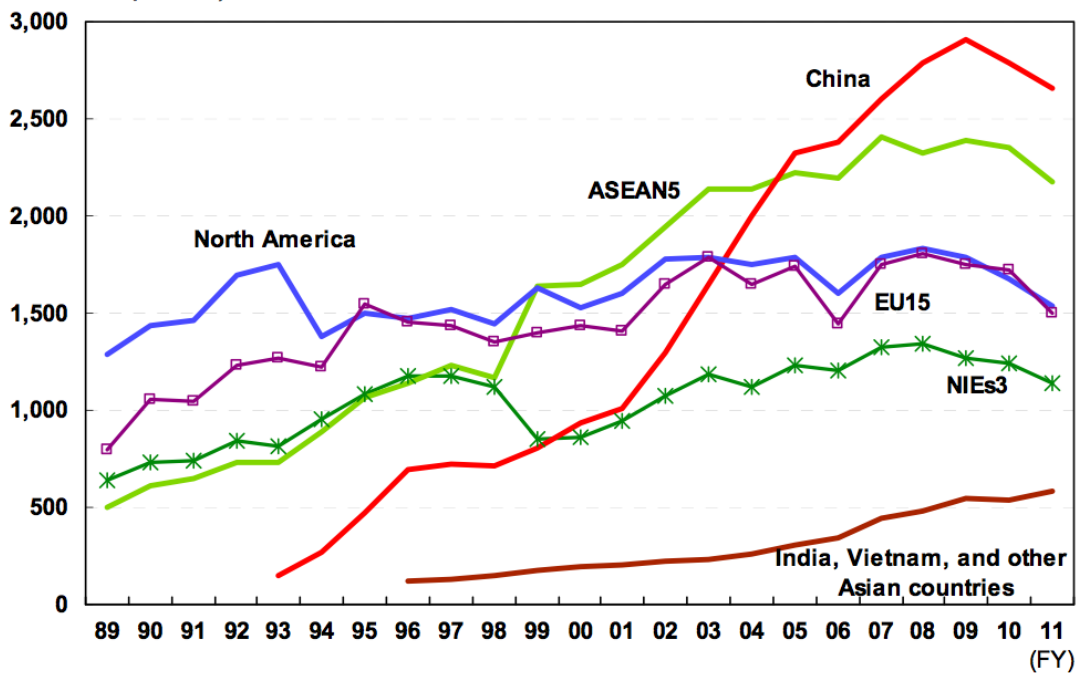
While some adverse effects of political distance can be expected, these results are not identifiable in the aggregate trade or investment data (Armstrong, 2009; Armstrong, 2012). The structure and scale of the relationship between Japan and China is such that even quite large bilateral political differences and apparent shocks to business confidence are marginal relative to the overall relationship. Japan's geographical proximity, capital, technology and know-how have been, and continue to be, important for China's economic modernisation. China's rapid growth, cheap production and its still-large market potential outweigh the risks of relatively low intensity political tension. Despite political tensions, not only has Japan and China's economic relationship not been derailed, but it has flourished. This is because of the underlying confidence both sides have that the other is committed to the rules and norms of the global trading system. The example of Japan and China stands in stark contrast to countless other cases around the world, where political tensions have had a profound impact on economic relations.

China's WTO accession coincided with the six year period of Prime Minister Koizumi where leadership visits did not occur and tensions were high. Yet not only did trade continue to grow, Japanese business in China boomed. Figure 2 shows the rapid increase in the number of Japanese firms doing business in China since 1993. Data is taken from the annual Japan Bank for International Cooperation (JBIC) survey on *Overseas Business Operations by Japanese Manufacturing Companies*. The figure shows an increase in the rate of growth of Japanese affiliates in China since WTO accession in 2001 and China overtaking the United States and Europe around 2003, and the largest five ASEAN countries⁴ together in 2005 to becoming the largest offshore location of Japanese business affiliates. The number of Japanese affiliates in China began to decrease in 2009, but the trend appears similar for all other major overseas operating bases.

⁴ Indonesia, Thailand, Philippines, Malaysia and Singapore.

Figure 2 Number of Japanese overseas affiliates

(No. of companies)



Source: JBIC (2012)

A recent development outside of the Japan-China relationship has potential to undermine the current economic relationship. There has been a loss of confidence in the global trading system following the collapse of the Doha Round of trade negotiations in the WTO and the global proliferation of preferential trading agreements that undermine the core WTO principle of non-discrimination. Beyond the WTO, there are no rules or frameworks that govern economic exchanges between Japan and China⁵. Hence an erosion of the global trading system could have implications for the bilateral relationship.

Economic effects of recent 'ice cold' politics

The events that led to increased political tensions between Japan and China took place at the beginning of the fourth quarter of 2012. The remainder of this paper assesses whether the bilateral economic relationship suffered in that final quarter of 2012. In making that assessment, trade in both directions will be compared against a counterfactual. But first, other aspects of the economic relationship and some evidence of how politics may have affected the economic relationship are discussed.

One important aspect of the economic relationship is direct investment from Japan to China. Effects on investment decisions occur with a longer lag time than with trade as investment proposals, approvals and implementation take time. Foreign direct investment (FDI) is also usually 'lumpy' as large projects distort

⁵ The Long Term Trade Agreement of 1978 and Bilateral Investment Treaty of 1988 are irrelevant to today's economic relationship.

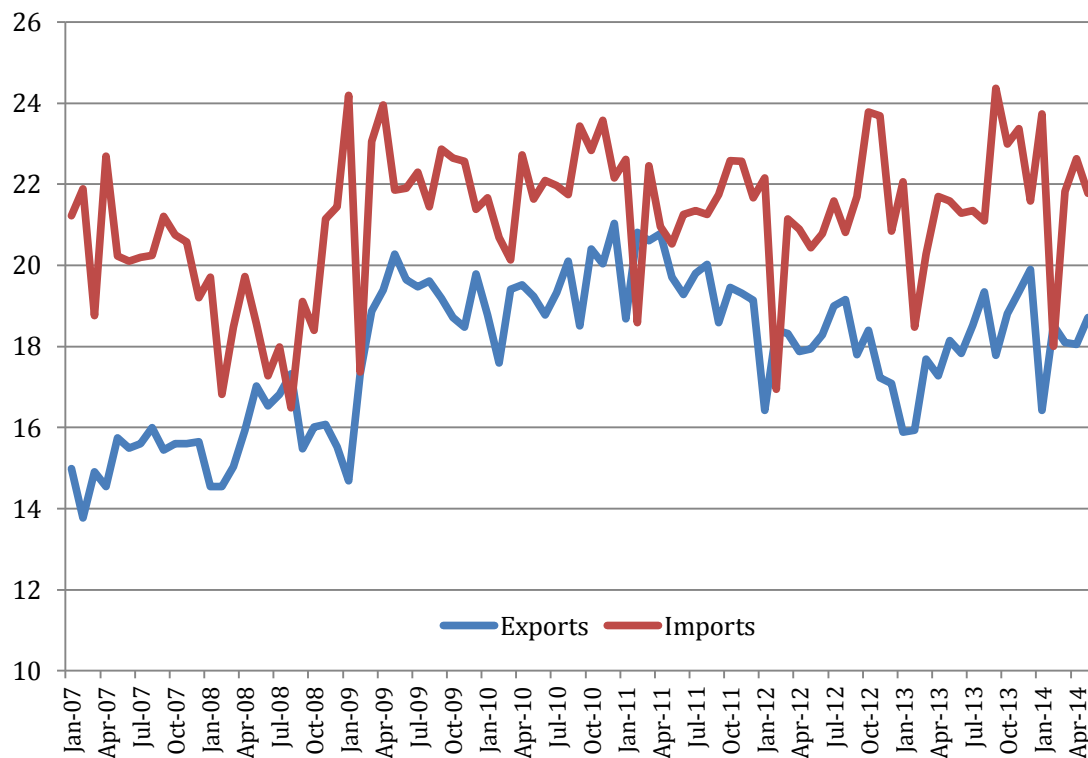
the data and shocks (or events) such as changes in regulatory rules or exchange rate movements can take 12 to 18 months to flow through to FDI data (Armstrong and Drysdale, 2011). Trade, on the other hand, can be impacted quickly as buyers and suppliers can relatively easily switch countries when circumstances change. It is the in-country commitment of FDI that makes it more sensitive to political differences between countries and country risk compared to arms-length trade (Armstrong and Drysdale, 2011).

This paper only focuses on the trade relationship between Japan and China but the nature of production networks in the region, of which Japan and China are major part, mean that trade and investment are closely linked.

Beyond aggregate trade and investment, the share prices or sales of Japan-exposed Chinese firms and China-exposed Japanese firms could be studied as Fisman et al (2013) did for earlier periods. A similar result of an adverse effect on firms is to be expected: after all, bilateral political spats that result in a ban on leadership visits and large-scale protests and boycotts are not congenial to trade and commerce between two countries. One difficulty with event studies that measure the impact over an event period for the 2012 case is that while a start date to the event can easily be identified, the time of resolution of political tensions is unclear and the ongoing low-intensity tensions could also have an effect on the economic relationship.

This paper looks for any effect on the aggregate trade relationship between Japan and China. The change in Japanese exports to China or Chinese exports to Japan is only part of the story. This paper uses a method that takes into account their bilateral trade in the context of total Japanese or Chinese trade, changes in the global economy, and other changes in key determinants of trade. It is difficult to assess changes in the bilateral trading relationship without those factors. For example, Figure 3 shows Japanese monthly trade with China as a share of total Japanese trade. This can tell part of the story, but does not take into account other characteristics of the Japanese and Chinese economies.

Figure 3 Share of total Japanese trade with China, per cent, 2007-2013



Source: Author's calculations from JETRO, <http://www.jetro.go.jp/en/reports/statistics/>

Figure 3 shows the cyclical nature of trade. Japanese imports from China fall sharply for the month of February each year and seem to be high in the last quarter of 2012 despite the tensions. Japanese exports to China as a percentage of total Japanese trade appear less cyclical but appear to be on a downward trend until the end of 2012 after which point they pick up.

Trade values and trade shares tell part of the story but are not sufficient themselves for assessing whether trade was as high as one might expect or lower than expected. To estimate what trade was *expected* to be, we need to compare the volume of trade that actually eventuated against a counterfactual. That is, without factoring in Japanese, Chinese, and third party GDPs (that change over time), and other factors in the regional and global economy, it is not possible to draw any robust conclusions about the performance of trade relationships.

The gravity model of trade is one of the most commonly utilised and empirically tested models in international economics. The model has successfully explained trade flows, with distance and mass (or size) as the main explanatory variables of trade. The model is based on the idea that trade volumes between two countries depend positively on the size of the two countries and inversely on the distance between them. The model should theoretically be able to predict the level of trade that can be expected given the characteristics of two trading partners and the distance between them. Importantly, it falls short of being able to do this.

The gravity model is widely used to explain trade determinants, but does not perform well when seeking to measure the performance of actual trade against expected trade as predicted by the model. Studies such as those conducted by Gros and Gonciarz (1995), Egger (2002), and Batra (2006) show that the ratios of actual to predicted trade can range from very small⁶ to over 35 times what the model predicts. Such large and implausible results are common when using traditional gravity models to predict potential trade. Indeed Egger (2002) has concluded that in-sample prediction of this sort does not work, and that the implausible results of actual trade being much higher than predicted trade mean that those gravity models are incorrectly specified.

This study applies stochastic frontier analysis to the gravity model of trade in order to construct a trade frontier that can be used to estimate potential trade. The method shifts the benchmark or counterfactual from being measured as the average of all characteristics of trade flows (which is what a conventional gravity model will produce) to an upper bound. The results are a single ratio for each trade relationship in each year. The stochastic frontier method was developed to measure agricultural productivity, and separates out the effects of shocks such as drought or flood from the measure of efficiency (that is, actual to potential output) for that farm (Aigner et al., 1977; Meeusen and van den Broeck, 1977). Unlike the results generated using a conventional gravity model, this method produces plausible results because stochastic frontier analysis separates out the resistances unique to the bilateral relationship from other shocks to the global trading system.

Without the use of a stochastic frontier gravity model, it is difficult to forecast expected levels of trade between Japan and China any given time – that is, not only after the 2012 events. The use of the stochastic frontier gravity model results in a measure of trade performance, which is actual trade as a ratio of potential trade. Potential trade is estimated as the highest possible value of trade – as if trade were occurring at the frontier – given the characteristics of the trading partners and is at frontier value. In order to obtain accurate estimates of the influence of bilateral characteristics of countries on trade and of third-party country effects, a world trade frontier is estimated using a matrix of global trade flows.

Trade performance is estimated for the period 2000 to 2013 but for 2012 and 2013, only an 'out-of-sample' prediction can be made for Japan-China trade given trade or GDP data for 2013 are not yet readily available for many countries. In other words, the coefficient estimates from the model are applied to the GDP, distance and other data to estimate potential trade values for 2013. Gravity models are usually estimated based on annual data. In this case, quarterly data is used for 2013 (and 2011 and 2012 to check for consistency) for the out of sample predictions in order to identify any changes in 2012 and 2013. While monthly trade data are available, GDP data are only available quarterly⁷.

⁶ This can be expected for some bilateral relationships.

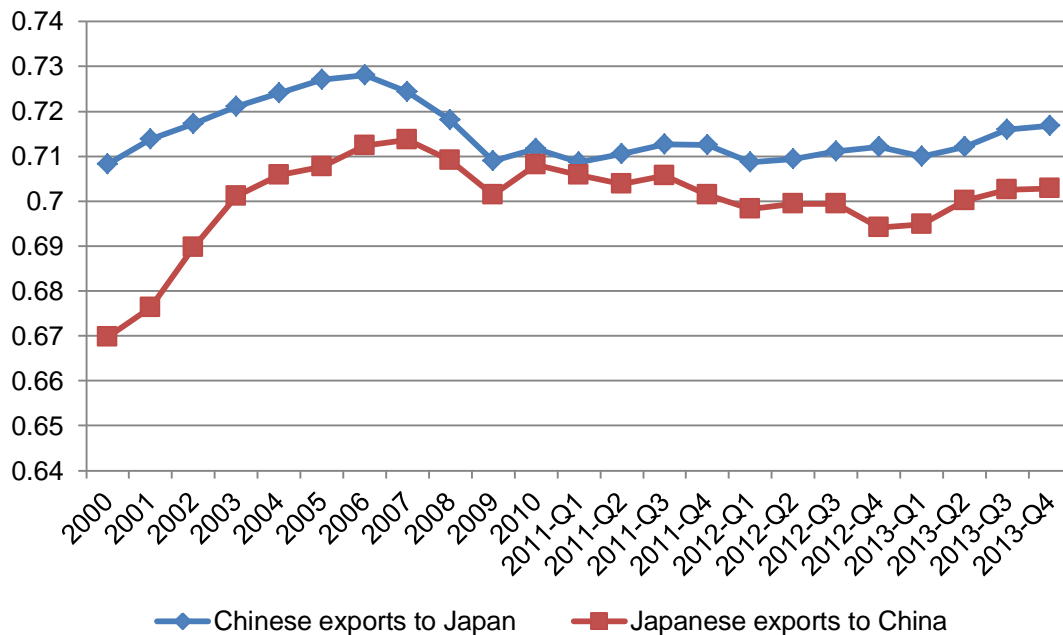
⁷ Chinese quarterly GDP data is taken from the National Bureau of Statistics of China. Given the short time series, it is difficult to seasonally adjust the data. There is an issue with the quarterly GDP

Details of the model specification, data sources and estimation results are discussed in the Appendix. The main results are shown in Figure 4. Trade performance for trade in both directions rises until about 2006 or 2007 and then falls until 2009 with a jump in 2010.

Trade performance between Japan and China is higher than what we might expect. Trade performance is higher than Japan's average export performance (with all its trading partners) at 37 per cent and import performance at 33 per cent of their potential. It is also higher than China's average export performance of 51 per cent and import performance at 41 per cent. The world average is 38 per cent, which is similar to previous studies using similar models (Armstrong and Drysdale, 2011; Armstrong, 2012).

The full set of results is not presented here, but trade performance measures are calculated for each trade flow in the model. Over the 12 year period, almost 147,000 bilateral trade flows are accounted for. The highest performing trade relationships are between countries or regions with free and open trading regimes and high quality trade infrastructure such as Singapore and Hong Kong.

Figure 4 Trade performance results, 2000 to 2013



Source: Author's calculation

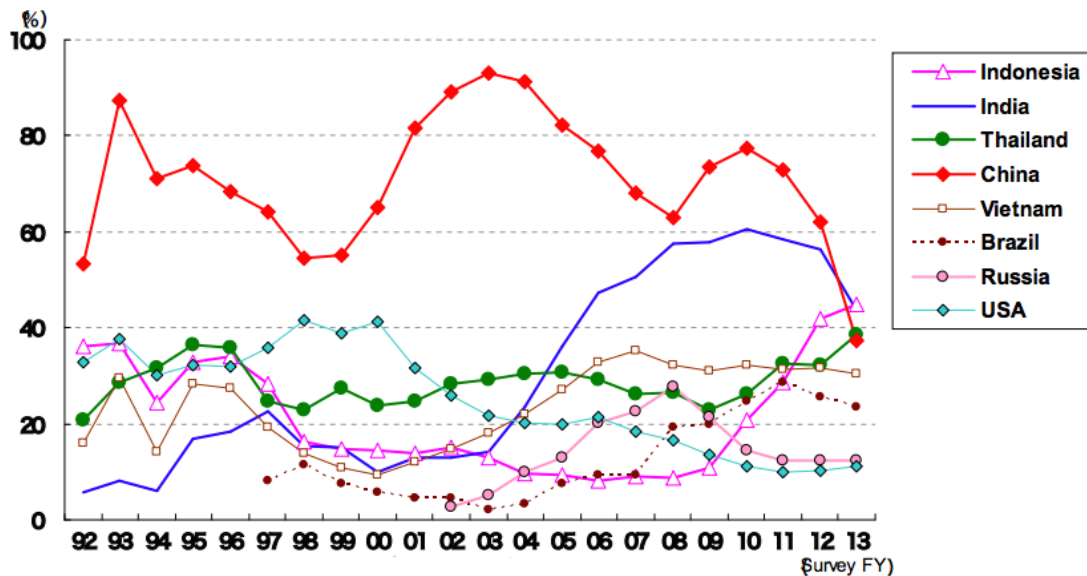
The fall in the realisation of Japanese export potential to China in the fourth quarter of 2012 coincides with the political difficulties between the two countries. But the realization of Chinese export potential to Japan does not fall in

data, as the fourth quarter GDP data is 42 per cent and 40 per cent higher than the average of the first three quarters of the year for 2011, 2012 and 2013 respectively. Such disparities distort the results, and therefore in this study the imperfect assumption is made that Chinese quarterly data is stable over the year.

that period. While there is a fall to close to 69 per cent of potential in the fourth quarter of 2012, and that is the lowest since 2002 right after China joined the WTO, realization of trade potential rises in 2013. Tensions were highest in 2012 but the political impasse has yet to be resolved.

Further investigation is required to assess whether the events in September 2012 have adversely affected aggregate trade in contrast to the negligible effect of historical periods of political tension between Japan and China (for example, in 2005 and 2010). A more comprehensive analysis can only be conducted with micro, or firm-level data, and as more data become available. Given what we do know, some other phenomena can go part of the way towards explaining the trade performance.

Figure 5 Promising Countries/Regions for Overseas Business over the Medium-term (next 3 yrs. or so)



Source: JBIC (2013)

The nature of the economic relationship could be changing with factors outside of the bilateral political relationship affecting the relative attractiveness of China as a destination for Japanese business, for example.

Japanese firms surveyed in the JBIC survey (2013) suggest that China is no longer the most promising country for overseas business in the medium term, for the first time in the history of the survey, dating back to 1989 (Figure 4). The number of companies responding that China was a promising country for expanding business fell to a record low. For the 2013 survey, China ranks below Indonesia, India and Thailand.

The same survey shows that in 2013, the biggest concern for Japanese companies doing business in China was rising labour costs and intensified competition. Over three-quarters of firms surveyed identified rising labour costs

as a concern, compared to only 55 per cent of companies that identified a lack of transparency in the legal system as an issue. Other issues that firms identified included: intense competition with other companies; insufficient protection of intellectual property rights; and security and social stability. The survey suggests that the issue of rising labour costs has assumed increasing importance over time. Security and social instability is a concern for Japanese firms in other countries, and until 2013 had not ranked among the top five sources of concern for doing business in China (JBIC, 2012)⁸.

The JBIC survey (2012) observes that 65 per cent of respondent companies in the automobile sector said that events surrounding the 2012 Senkaku/Diaoyu Islands furore were hurting sales. In addition, 53 per cent of companies responded that sales had declined during the protests and boycotts.

Conclusion

Rapid growth in trade between Japan and China has been achieved despite unresolved history and political ups and downs. Measured against potential trade, the bilateral trading relationship of Japan and China has been above and beyond what they have achieved with other trading partners and the average realisation of potential globally. Trade has been driven by the two countries' geographical proximity, their complementary economic structures, and the rapid growth of China's economy.

There is little evidence to suggest that political tension between Japan and China affects aggregate trade and investment even during times of heightened tension. The reason has been the commitment of both countries to the rules and norms of the global trading system and in particular because of the liberalisation and reforms that China committed to in its accession to the WTO.

Trade performance for Japanese exports to China fell in the last quarter of 2012 to their lowest since 2002. Nonetheless, it was still much higher than the average Japanese and Chinese trade performances and also higher than the world average. Trade performance from China to Japan remained steady in 2012. Trade performance for 2013 shows an upward trend with growing realisation of trade potential in both directions. There is no clear evidence that the political tensions have disrupted trade in 2012 or 2013.

⁸ The fall in Japanese investment to China in the first half of 2014 is often attributed to the political tensions between the two countries (see, for example, <http://www.japantimes.co.jp/news/2014/07/15/business/economy-business/japans-direct-investment-china-fell-half-first-half/>) but total FDI into China only rose 2.2 per cent in the same 6 months suggesting other investment sources are also reducing FDI into China giving support to the results of the JBIC survey which suggests the main driver of the reduction in FDI is due to rising labour costs. There is yet to be decisive evidence produced that suggests any significant portion of the fall in FDI is due to political tensions.

It is difficult to attribute the fall in realisation of trade potential in 2012 to political tensions, and it would be desirable for further work to be carried out in this area once more data becomes available. There are coinciding factors such as China becoming relatively less attractive to Japanese firms as a trading partner and investment destination because of a number of factors, including rising labour costs.

In the past, the economic relationship between Japan and China has constrained and shaped the nature of the political relationship. It is notable that the trade and investment relationship has not been derailed by the political tensions arising from territorial or other disputes. But the politics are currently not helping the economics, and if the economic relationship starts to suffer significantly because of the politics, the bilateral relationship will lose some valuable ballast.

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Appendix

Specification of Stochastic frontier gravity model of trade with trade inefficiency determinants

Based on the approach suggested by Battese and Coelli (1995), the stochastic frontier gravity model of trade is defined as

$$\ln X_{ijt} (IM_{ijt}) = b_0 + b_1 \ln Y_{it} + b_2 \ln Y_{jt} + b_3 \ln Dist_{ij} + b_4 trend + v_{ijt} - u_{ijt} \quad (1)$$

where X_{ijt} (IM_{ijt}) are the volume of exports (imports) between country i (reporter) and country j (partner), Y_i and Y_j are GDP of countries i and j as economic mass variables, $Dist_{ij}$ represents distance between two trading partners, and $trend$ accounts for changes in trade potential between them, v_{ijt} is the random error term and u_{ijt} is the one-sided non-negative random variable. By construction, the term u_{ijt} is defined as trade inefficiency effects, which cause actual bilateral trade between two trading partners to deviate from their trade potential level. Trade inefficiency is assumed to a function of natural and socio-economic factors and policy variables presented by the trade inefficiency model as follows:

Inefficiency effect model

$$m_{ijt} = d_0 + d_1 contig_{ij} + d_2 comlang_off_{ij} + d_3 \ln R_{it} + d_4 \ln R_{jt} + d_5 ANDEAN + d_6 ASEAN + d_7 APEC + d_8 EU + d_9 MERCOSUR + d_{10} NAFTA + w_{ijt} \quad (2)$$

These empirical models are estimated using the estimation procedure recently developed by Belotti et al. (2012) that is based on the STATA program. The estimation procedure uses the maximum likelihood estimation method. The parameters of the stochastic trade frontier trade and trade inefficiency models are simultaneously estimated for all countries with both positive import and export flows with their trading partners.

The model is estimated for 177 of the largest exporters and importers globally for the period 2000-2011 and consequently, the estimated trade frontier model presents a world trade frontier. Trade data are from the United Nations COMTRADE database, through the World Bank's World Integrated Trade Solution (WITS), which is a data extraction and consultation system. Trade data include export and import data for all countries of interest in current USD. Data on GDP and GDP per capita as well as simple average tariff rate are obtained from the World Bank World Development Indicators database (WDI). Finally, data on bilateral geographical distances, common borders, and common languages are extracted from the database of French Institute for Research on the International Economy (CEPII). The bilateral geographical distance used in this study is the great-circle distance between major cities of each economy. Data on various free trade agreements (FTAs) are created using information on country membership available on the Wikipedia website⁹.

⁹ https://en.wikipedia.org/wiki/Main_Page

Alternative hypotheses need to be tested to justify our stochastic frontier approach to measuring and modeling trade flows with the assumption on trade friction effects. As suggested by Battese and Coelli (1995), generalized likelihood ratio (LR) tests are required to confirm the functional form and specification. The relevant test statistic is

$$LR = -2\{\ln[L(H_0)/L(H_1)]\} = -2\{\ln[L(H_0)] - \ln[L(H_1)]\}$$

where $\ln(H_0)$ and $\ln(H_1)$ are the values of the likelihood function under the null and alternative hypotheses respectively. According to Coelli (1995), under the null hypotheses on the maximum likelihood estimates, this test statistic has an asymptotical mixed chi-square distribution. The critical values of the mixed chi-square distribution are obtained from Kodde and Palm (1986) at the 1 percent level of significance with the degree of freedom equal to the number of parameters assumed to be zero under the null hypothesis. The results of all hypothesis tests are reported in the Table A3 below.

Table A3: Likelihood ratio tests of hypothesis of the trade inefficiency effects and their determinants

Null hypothesis	$\chi^2_{0.99}$ ^a value & df	Import flows model		Export flows model	
		χ^2 -stat	Decision to Ho	χ^2 -stat	Decision to Ho
$g = m = 0$					
(No trade inefficiency effects and trade inefficiency factors affect directly trade potential = Mean response function)	8.27 (2)	153880	Reject	168999	Reject
$g = d_0 = d_1 = \dots = d_{10} = 0$					
(All inefficiency effects and their influencing factors are absent)	25.55 (12)	18773	Reject	16090	Reject
$d_1 = \dots = d_{10} = 0$					
(Trade inefficiency exists, but there are no factors influence the term)	22.53 (10)	3370	Reject	3172	Reject

Note: (a) The critical values for the hypotheses are obtained from Kodde and Palm (1986), Table 1; (b) This critical value is at the 5% level of significance.

Source: Author's calculations.

The first null hypothesis specifies that the inefficiency effects are not stochastic (this means the variance of the inefficiency effects σ_u^2 is zero). The LR values for both import and export flow models are much higher than the critical value of $\chi^2_{0.99}$, leading us to strongly reject the null hypothesis. This implies that technical inefficiency effects are very significant and the OLS estimates associated with the mean response function are not appropriate in this case. The second null hypothesis, which states that inefficiency effects and their determinants are absent from the model, is rejected at

the 1 percent level of significance with high values of the LR. The third null hypothesis that natural, socio-economic factors as well as policy variables do not jointly have any impact on trade inefficiency is also strongly rejected at the 1 percent level of significance.

FRONTIER MODELS WITH SFPANEL IN STATA

Variables	IMPORT FLOWS		EXPORT FLOWS	
	Coefficient	Standard errors	Coefficient	Standard errors
Trade Frontier				
lngdpi	0.828***	(0.00)	0.996***	(0.00)
lngdpj	0.963***	(0.00)	0.794***	(0.00)
lndistw	-1.014***	(0.01)	-1.168***	(0.01)
trend	-0.069***	(0.00)	-0.061***	(0.00)
Constant	-24.347***	(0.10)	-23.439***	(0.10)
Inefficiency Effects Model				
contig	-15.244***	(0.76)	-25.304***	(1.43)
comlang_off	-4.843***	(0.16)	-6.388***	(0.22)
lnRi	0.220***	(0.04)	1.633***	(0.06)
lnRj	1.439***	(0.06)	-0.053	(0.05)
ANDEAN	-30.266***	(8.12)	-28.892***	(7.80)
ASEAN	-2.962**	(1.35)	-15.285***	(4.02)
APEC	-43.929***	(2.19)	-35.344***	(2.05)
EU	-10.864***	(0.56)	-9.185***	(0.52)
MERCOSUR	-32.354***	(8.97)	-23.329***	(7.42)
NAFTA	-3.779	(18.39)	9.478	(13.23)
Constant	-1.063***	(0.23)	-1.831***	(0.24)
Usigma	2.939***	(0.02)	2.818***	(0.02)
Vsigma	0.539***	(0.01)	0.617***	(0.01)
N	146942		146942	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author's calculations.