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Transparency, Trade Costs, and Regional Integration in the Asia Pacific

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Abstract

The authors show in this paper that increasing the transparency of the trading environment can be an important complement to traditional liberalization of tariff and non-tariff barriers. Our definition of transparency is grounded in a transaction cost analysis. The authors focus on two dimensions of transparency: predictability (reducing the cost of uncertainty) and simplification (reducing information costs). Using the

Asia Pacific Economic Cooperation (APEC) member economies as a case study, the authors construct indices of importer and exporter transparency for the region from a wide range of sources. Our results from a gravity model suggest that improving trade-related transparency in APEC could hold significant benefits by raising intra-APEC trade by proximately \$148 billion or 7.5 percent of baseline trade in the region.

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Transparency, Trade Costs, and Regional Integration in the Asia Pacific

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1 Introduction

In the development context, it is increasingly recognized that tariff liberalization, while necessary, is not on its own sufficient to ensure the integration of an economy into international markets (World Bank IEG, 2006). Barriers other than tariffs, as well as supply side constraints, hinder firms in emerging economies from successfully entering export markets. With falls in applied tariff rates in many countries over recent decades, attention has increasingly shifted to non-tariff barriers (NTBs) and other non-traditional sources of trade costs. Gradually, the boundaries of the trade policy space have moved further behind the border, as analysts and policymakers have come to recognize the very broad range of economic and institutional features that can impact international trade flows. When looking at the factors influencing trade performance, it is therefore important to take a holistic approach that includes all aspects of a country's trading environment.

The key contribution of this paper is to provide a framework within which to analyze an important but under-researched aspect of the trading environment, namely its transparency. Our contention is that exporters' and importers' incentives are impacted not just by *what* governments do, but by *how* they do it. The nominal restrictiveness of trade policy makes up most of the "what", while transparency is an important part of the "how". We provide transparency with precise analytical content by defining it in terms of two fundamental attributes: simplification and predictability. A simpler and more certain trading environment is thus considered to be a more transparent one. Using APEC member economies as a case study, we show in turn that a more transparent trading environment is associated with increased bilateral trade.

While a number of previous studies have examined the broader links between institutions and trade, ours is the first to analyze in detail the issue of transparency—one particularly important aspect of a country's institutional setup. Anderson and Marcouiller (2002) find that weak institutions act as significant barriers to international trade: import/export transactions are inherently risky due to, for example, imperfect contract enforceability,

and such factors are in effect given free rein under weak institutional regimes.³ Those authors use World Economic Forum data to construct an index of the strength of institutions that support trade, focusing on contract enforcement and the existence of impartial and transparent government policies. Thus, while the concept of transparency is crucial to their work, their empirical development of its scope is much broader than ours: whereas they consider the general transparency of a country's governance structure, we focus on the trading environment itself to develop a multi-dimensional measure of transparency that is as closely related as possible to the processes of exporting and importing.

Levchenko (2007) complements the Anderson and Marcouiller (2002) approach by embedding cross-country institutional differences affecting contract enforceability in a general equilibrium model of trade. Using import share data for the USA, he shows empirically that higher institutional quality in the exporting country is associated with stronger trade flows in complex products, which are argued to be institutionally intensive due to the need to contract for intermediate goods. He measures institutional quality using the rule of law component of the World Bank's *World Governance Indicators* dataset.

By contrast, de Groot et al. (2004) take a much broader approach to examining institutions and trade, including all of the *World Governance Indicators* in their measure of institutional quality. In addition to rule of law, they also take account of voice and accountability, political stability, government effectiveness, regulatory quality, and control of corruption. Using a gravity model, they find that both institutional quality and the existence of similar institutions in trading partners are positively associated with bilateral trade.

Finally, Francois and Manchin (2007) measure institutional quality through the lens of economic freedom, focusing on aspects such as the size of government, freedom of trade, protection of property rights, and business regulation. They find that strong institutions in this sense are associated with increased trade at both the intensive and extensive margins.

³ Ranjan and Lee (2007) report similar findings using more detailed data on contract enforcement. They also find evidence that the link between contract enforcement and trade is stronger for differentiated goods than for homogeneous ones.

That is, they result not only in stronger bilateral trade flows, but also an increased probability that countries will trade at all.

We extend this recent work in three ways. First, “unbundling” institutions and focusing on one important aspect—transparency in the trading environment—allows us to bring additional focus and clarity to what is potentially a very wide-ranging area. In this sense, our approach is complementary to the recent work on contract enforcement referred to above: it too concentrates on just one aspect of the broader links between institutions and trade.

Second, we develop a comprehensive set of indicators that measure the transparency of a country’s trading environment from a number of different perspectives. Using APEC member economies for our empirical work, we examine both perceptions-based and “objective” data taken from sources such as the *Global Competitiveness Report*, the *Doing Business* dataset, and a new *Logistics Perception Index* developed by the World Bank. These data cover issues such as the prevalence of trade-related corruption, political favoritism, efficiency of customs and border agencies, the extent of hidden trade barriers, and uncertainty surrounding trade policy settings, logistics performance, and corruption. We then use factor analysis to combine these indicators into two composite measures of transparency: the Importer Transparency Index (ITI) and the Exporter Transparency Index (ETI).

Third, our empirical work using a gravity model of intra-APEC trade attempts to account for the possible endogeneity of transparency using an instrumental variables strategy. In our APEC sample, we find that British colonization prior to the 20th Century is closely associated with higher transparency today. We therefore exploit variation in the pattern of British colonization to identify exogenous changes in transparency. That our core result is robust to instrumental variables estimation is an important finding, since existing work on institutions and trade assumes—but does not test for—exogeneity.

The paper proceeds as follows. In the next section, we discuss in greater detail the links between transparency and trade. Our analysis takes a transaction cost perspective, in which predictability and simplification of the trading environment are associated with lower cost burdens facing exporters and importers. Section 3 introduces our dataset, and

provides an overview of trading environment transparency in the APEC region. After reviewing individual indicators, we synthesize them into two comprehensive measures: the ITI and ETI. Results from a theory-consistent gravity model in section 4 provide evidence in favor of our contention that transparency of the trading environment can impact trade over and above the effects from trade policy measures such as tariffs and NTBs, which we control for explicitly. Section 5 concludes with some preliminary policy implications of our work, as well as suggestions for future research in this area.

2 Transparency, Transaction Costs, and Trade: What are the Links?

The extent of a country's integration into the world trading system depends on the incentives facing its potential importing and exporting firms. High transaction costs due to tariff or non-tariff barriers, excessive transport costs, or unduly burdensome export/import procedures can easily be seen to reduce the attractiveness of trade from a firm's point of view, thus inducing them (at the margin) to look inwards rather than outwards in terms of their development.⁴

To make clear that the variety of sources of trade transaction costs is much broader than the set of measures traditionally subsumed under the heading of trade policy, we refer to these factors as a country's *trading environment*. By analogy with the literature on investment climate (World Bank, 2005), we envisage the concept of trading environment as encompassing the full set of location-specific factors that shape opportunities and incentives for firms to engage in import and export transactions. The trading environment thus includes the full range of transaction costs affecting trade, both "hard"—e.g., infrastructure and geography—and "soft"—e.g., institutional quality. Trade facilitation, in the broad sense in which Wilson et al. (2005) use that term, can be seen as the set of policy instruments aimed at improving a country's trading environment by reducing unnecessarily high transaction costs across all of these fronts.

⁴ This dynamic can be seen clearly in recent models of trade with heterogeneous firms, following Melitz (2003): domestic producers self-select into export markets based on firm productivity and the extent of cost barriers that they face.

Recent empirical work looking at the various aspects of trade transaction costs has tended to focus on what governments do—or could do—to try and directly influence the levels of particular costs. For instance, action to improve trade-related infrastructure, such as roads and ports, can impact “hard” trade transaction costs and thus bilateral trade flows (see Limao and Venables, 2001; and Wilson et al., 2005). Similarly, there is now also empirical evidence that action to improve contract enforceability can reduce “soft” trade transaction costs, with similar flow-on effects to observed bilateral trade (see Anderson and Marcouiller, 2002; and Levchenko, 2007).

In this paper, we seek to broaden the scope of discussions on trade transaction costs and their impacts by recognizing that the trading environment has a procedural aspect in addition to the substantive ones examined in the research mentioned above. In a nutshell, we will argue that it is not just *what* governments do that matters for trade transaction costs, but also *how* they do it. Unpredictability and undue complexity in the design, implementation and administration of trade policy can constitute independent sources of transaction costs, over and above those flowing from the nominal restrictiveness of the trade policy measures themselves. To clarify exactly what we mean by this, it is useful to consider a couple of examples that bring out the importance of the “how”: using tariff bindings to reduce the uncertainty of the trading environment, and simplifying it by reducing the information costs firms must absorb in order to find out exactly what a country’s trade policy actually is.

2.1 Tariff Bindings and Internet Use: Two Examples of Promoting Transparency

Francois (2001) and Francois and Martin (2004) show that while reductions of applied tariffs can have obvious, first-order impacts on exporters’ and importers’ incentives, locking in those cuts—or “binding” them in WTO terms—can have additional economic impacts over and above those of the tariff cut itself. The economic logic behind this is simple, and is an example of an important, more general argument in relation to transparency: increased predictability can reduce the effective trade costs faced by business.

When making plans, firms care about their expected level of profits. This in turn depends on the transaction costs they expect to face when importing or exporting. The process of

binding tariffs acts directly on firms' expectations, by placing an upper limit on the rate that a particular tariff can take in the future. A simple tariff cut without binding can be undone relatively easily, and so does not impact firms' expectations to the same extent. To give an idea of the orders of magnitude involved, Francois and Martin (2004) find that in the case of wheat tariffs pre- and post-Uruguay Round, reductions in tariff uncertainty were responsible for at least half the overall welfare gains in four of the seven economies studied.

In addition to its direct costs, trade policy can also impose indirect costs on firms due to the need to gather information on the set of measures in place and the steps required to comply with them. The complexity of the trading environment is clearly a key variable in assessing the potential magnitude of these information costs. For the hypothetical case in which the only trade cost is a bound, ad valorem tariff published through a government website, the associated information costs for traders are clearly very small. When a nominally equivalent level of cost is achieved using a combination of an ad valorem tariff, licensing requirements, product standards and certification, complex customs procedures, delays at port, and perhaps the occasional bribe to avoid one or all of these hurdles, then the information costs facing potential exporters or importers can be very high indeed.

An important example of this dynamic is the role played by the internet in expanding trade over recent years. Freund and Weinhold (2004) argue that the spread of the internet could be one factor reducing the costs of export market entry, since it makes foreign information easier (and cheaper) to obtain. Those authors conclude that growth in web hosts contributed on average to a 1% rise in annual export growth between 1997 and 1999. Thus, simplification of the trading environment through a reduction in effective information costs can be a useful force in promoting bilateral trade.

2.2 Consolidation: Transparency as Predictability and Simplification

Transparency is a very broad concept. If it is to be of use in empirical research and policy work, it must be given more precise analytical content so that it can plausibly be related to observable data. As the above discussion suggests, viewing transparency in terms of the "how" side of the trading environment assists us in identifying two important aspects

of the concept: predictability and simplification. The first of these is a way of reducing “soft” transaction costs stemming from uncertainty—as in the case of tariff bindings—while the second reduces information costs related to an overly complex cost environment.

There is as yet little quantitative evidence as to country performance in relation to transparency, or economic impacts of reform. However, transparency as a concept is well-entrenched in the architecture of the multilateral system (see Woolfe, 2003, for a review). A few well-known examples suffice to make the point. As already noted, binding tariffs (GATT Article II) is one way of promoting transparency through increased predictability. In addition, Article VIII recognizes the desirability of simplifying import and export formalities and documentation, while Article X requires prior publication of certain trade-related laws and regulations, as well as their impartial administration. The first is an example of transparency through simplification, while the second can be seen as a measure designed to enhance predictability. In a different context, the Agreement on Antidumping sets up a system of obligations designed to ensure a minimum of procedural fairness in the context of antidumping investigations and determinations (Article 6), thereby providing firms with some level of assurance that the rules will be applied in a relatively predictable fashion. Finally, the WTO’s Trade Policy Review Mechanism contributes to transparency by ensuring that basic trade policy information is regularly put into the public domain, and gives Members the opportunity to ensure that the rules of the game are being complied with, thereby enhancing predictability.

As this discussion suggests, even focusing just on two crucial aspects of transparency—predictability and simplification—opens the field to a range of considerations. The remainder of the paper focuses on developing a methodology for measuring country performance along these two dimensions using a wide variety of indicators, and on assessing the quantitative impact that transparency thus defined has on international trade flows.

3 Measuring the Transparency of the Trading Environment: An APEC Case Study

The member economies of APEC provide an ideal case study platform for the approach to transparency developed in this paper. APEC is an extremely diverse regional grouping, including economies at markedly different levels of economic development, and with vastly different institutional environments. Moreover, APEC has been active in promoting a wide-ranging approach to reducing trade transaction costs through its initiatives on trade facilitation. In its 2001 Principles on Trade Facilitation, the role that transparency can play in improving the trading environment is brought out by explicit references to the two dimensions of primary interest here, predictability and simplification:

“Simplification, Practicability and Efficiency: Rules and procedures relating to trade should be simplified to ensure that they are no more burdensome or restrictive than necessary...

Consistency and Predictability: Rules and procedures relating to trade should be applied in a consistent, predictable and uniform manner with integrity so as to minimize uncertainty to the trade and trade related parties. ...”

We now proceed to develop in greater detail our proposed measures of transparency in the trading environment by reference to the situation prevailing among APEC member economies. First, we present data on individual indicators related to predictability and simplification. We then use factor analysis to produce composite indices of transparency from the exporter and importer perspectives.

3.1 *Predictability Measures*

Predictability of the trading environment implies that all agents involved in import and export transaction are informed in a comprehensive and timely manner on existing and upcoming policy measures. Furthermore, in addition to the *what* of government action, predictability is particularly important in *how* government implement their measures. If the rules and laws are applied in a consistent and transparent manner, traders are able to

better anticipate the trade costs (such as time and administrative costs) they face for international transactions.

Since predictability comes in different guises, on the empirical side one needs to have regard to different measures. As mentioned above, an important indicator of predictability in tariff policy is the percentage of bound tariff rates. WTO members are able to bind their tariffs at a certain rate, which cannot easily be exceeded.⁵ Tying the authorities' hands with respect to the level of tariffs translates into a higher predictability for traders, which ultimately reduces costs of doing business. Gauging the percentage of bound tariff rates reveals the degree of tariff certainty that traders face.

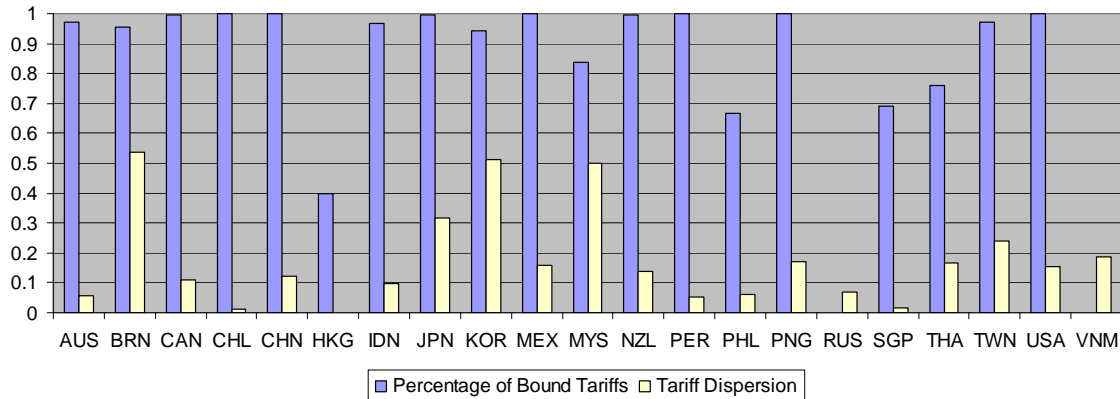
Another empirical measure of the complexity of a tariff schedule is the dispersion of tariff rates across products. A high dispersion would indicate that the tariffs fluctuate substantially and therefore can render the expected applied tariffs less predictable. In the extreme case of a “flat” tariff—i.e., the same ad valorem rate applied to almost all goods, as in Chile or Hong Kong China—there is no scope for dispute between a foreign exporter and the customs administration as to the rate of duty that should be applied to a particular shipment of goods. However, the more complex a national tariff schedule becomes, the more scope exists for classification disputes to arise. We therefore argue that a less dispersed, or “flatter”, tariff schedule is associated with greater policy predictability.

The second column of Figure 1 depicts the standard deviation of effective applied MFN tariffs⁶ in HS 6 digit product groups for all 21 APEC economies. It is interesting to observe that Chile, which applies for almost every product line a flat tariff, Hong Kong China, which allows duty-free trade across all lines, and Singapore, all show relatively low levels of tariff dispersion—as expected given their policy respective policy choices.

⁵ WTO Members are allowed to apply a lower tariff level and freely change it as long as it stays below the bound rate. WTO members therefore often prefer to bind their tariffs at a relatively high level in order to maintain considerable freedom in their tariff policy decisions.

⁶ The effective applied MFN rate takes into account specific tariffs by dividing them by the unit value. For more information see data appendix.

Figure 1: Bound Tariffs and Tariff Dispersion in the case of APEC



Managing the tariff schedule is not the only trade policy instrument where predictability becomes important. Governments can apply a number of trade policy measures others than tariffs. They are often summarized as non-tariff barriers (NTBs) and encompass all measures that have potential trade effects, such as technical standards, trade remedies, or quotas. As multilateral, regional and bilateral trade liberalization efforts have pushed the overall tariff level down, NTBs are gaining more and more significance in the international trading system. Comparative analyses of NTBs are relatively rare, mainly because many NTBs are not easily quantifiable.⁷ However, we are not primarily interested in the presence of NTB, but in the transparency of NTBs. The Global Competitiveness Report (GCR) published by the World Economic Forum (WEF) provides useful information in this respect, based on trade barriers as identified by the business community.⁸ In the 2004 GCR, survey participants were asked to assign a score from 7 (strongly agree) to 1 (strongly disagree) to each of the following questions:

⁷ Ching et al. (2004) provide an insightful analysis of the presence of NTB in the Pacific Rim region using a small firm-level survey. According to their study, NTBs are frequently encountered in this region and they have a significant impact on firms' production costs, revenue, and expansion plans. Recently, the World Bank Development Research Group (see Kee et al., 2006) developed an index of trade restrictiveness that covers a large number of developing and developed economies. Trade restrictiveness is measured taking into account the tariff level, but also NTBs. Among the NTBs considered are price and quantity measures, monopolistic measures as well as technical regulations. The exact data sources and methodologies are described in detail in Kee et al. (2006). As for tariffs, we control for the presence of NTBs in our gravity equation, using the available data from Kee et al. (2006).

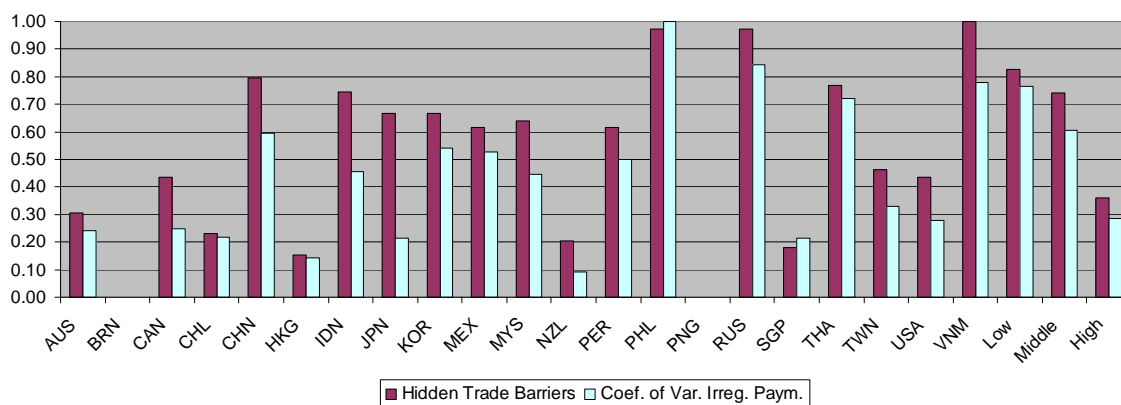
⁸ The WEF conducts each year an international survey assessing the competitiveness of a large number of developed and emerging economies.

- “In your country, hidden import barriers (that is, barriers other than published tariffs and quotas) are an important problem or not an important problem?”
- “In your industry, how commonly would you estimate that firms make undocumented extra payments or bribes connected with the import and export permits?”

The first question aligns well with the subject of interest here and the answer serves as a proxy to gauge the degree of transparency in the application of non-tariff measures. The second question goes in a similar direction, but focuses more on NTBs related to red-tape and corruption.

We have collected the answers to these two questions for 19 available⁹ APEC economies and rescaled the results from 0 (hidden import barriers/extra payments or bribes are not a problem) to 1 (hidden import barriers/extra payments or bribes are a problem). The results are presented in the first and second columns of Figure 2. In order to allow a comparison of APEC economies with other economies we also report the average performance of economies classified by the World Bank as low-income, lower- and upper-middle income, as well as high income.

Figure 2: Hidden Trade Barriers and Irregular Payments (Coef. of Var.) in the case of APEC



According to the GCR data, Hong Kong China, New Zealand, and Singapore take the lead in this comparison. Most of the middle-income economies in APEC do better than

⁹ Brunei Darussalam and Papua New Guinea were not covered in the GCR 2004.

the world income group average. However, in China, the Philippines, Russia, and Thailand the business community perceives hidden trade barriers that are above the world-average for middle income economies. Finally, in the one APEC economy which belongs to the low-income group, namely Vietnam, traders still appear to struggle with hidden trade barriers, also compared to other low-income economies.

The GCR provides not only the average score for each of these questions, but also the standard deviation of the replies. The standard deviation reveals important information about the certainty of traders to be confronted with hidden trade barriers or irregular payments. Even though the standard deviation is not a direct measurement of uncertainty, the dispersion of answers indicates how differently the issue is perceived and therefore helps us gauge the uncertainty among traders. In the second column of Figure 2 depicts the coefficient of variation for the replies given to the question on irregular payments for imports and exports. The two extremes are New Zealand on the one hand and the Philippines on the other. In New Zealand, irregular payments appear not only to be rare, but traders also know what to expect. In the Philippines irregular payments for imports and exports remain present and their size varies substantially.

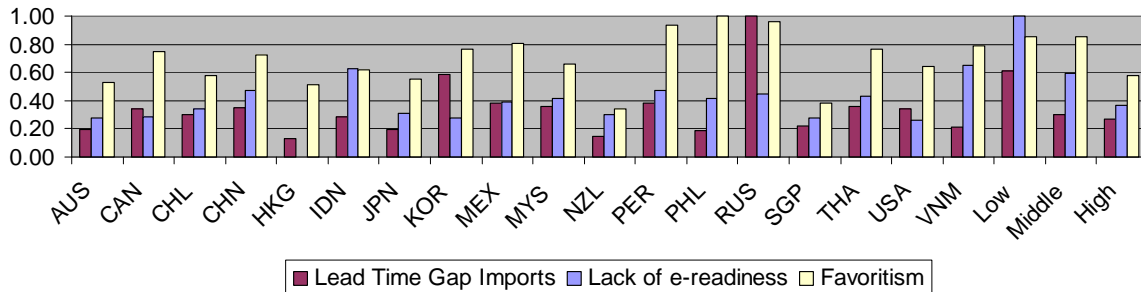
The Logistics Perception Index (LPI) 2006 of the World Bank is another valuable source to measure particular dimensions of transparency in the trading environment (Arvis and Mustra, 2007). The LPI tries to capture the logistics “friendliness” of economies and is based on a survey of global freight forwarders and express carriers. The data covers 100 economies, including all APEC economies except Brunei Darussalam, Papua New Guinea, and Chinese Taipei. The LPI contains variables that can be used to derive measures of predictability.

The LPI records the maximum and minimum lead time for exports and imports. The gap between both reveals interesting information about the predictability of clearance time for traders. If the difference between both variables is small, traders are able to manage the supply-chain with great accuracy. On the other hand, as the gap between the two variables becomes large, it indicates that the clearance time can vary substantially. This implies a high degree of uncertainty for traders, which ultimately translates into

additional business costs due to the need to maintain larger inventories (Arvis, Raballand, and Marteau, 2007).

In the first column of Figure 3, we present the gaps in clearance times for imports for APEC economies as well as the average for low-, middle-, and high-income economies. Figure 3 illustrates that Vietnam, the only low-income economy in APEC covered by LPI, has very small gaps in both dimensions placing it among the best performers, such as Singapore. The middle-income economies in APEC have similar gaps to the world average for middle-income group. Among the high-income economies, Hong Kong China and New Zealand take the lead.

Figure 3: Lead Time Gap (Imports), Lack of E-Readiness, and Favoritism in the Case of APEC



Effective use of information technology is another possible way in which governments can make the trading environment more transparent. We assess this dimension using the UN’s ranking of the e-government readiness of its Member States.¹⁰ It measures the level of telecommunication and human capital infrastructure development in an economy, and reflects to what extent governments make use of this infrastructure for the provision of information, products and services.

In the second column of Figure 3 we summarize the performance of APEC economies with respect to e-government readiness (lower values indicate a higher degree of e-government readiness).¹¹ In this comparison, nearly all middle- and high-income APEC

¹⁰ The ranking is based on a composite index comprising the Web measure index, the Telecommunication Infrastructure index and the Human Capital index.

¹¹ UN Global E-government Readiness Report does not contain data for Hong Kong China and Chinese Taipei.

economies do far better than the world average of the corresponding income group. Australia, Canada, Korea, New Zealand Singapore, and the USA have achieved a particularly high level of e-government readiness. In Papua New Guinea as well as Vietnam much work remains to be done in order to increase the government's use of the internet and to build up a comprehensive information technology infrastructure.

Finally, the GCR asks one question that captures the extent of favoritism in administrative decisions. The question is as follows:

- When deciding upon policies and contracts, government officials (1 = usually favor well-connected firms and individuals, 7 = are neutral among firms and individuals)

We argue that excessive liberty for administrators to favor particular firms signals a lack of transparency. The results of the GCR on favoritism are summarized in the last column of Figure 3. New Zealand and Singapore stand out as economies in which favoritism is perceived as almost absent. Chile shows the strongest performance in their income group. Favoritism seems to severely impact business in other economies, especially several developing member economies.

3.2 Measures of Simplification

Simplification in the trading environment aims at organizing all procedures and actions involved in import and exports in the most efficient way. In many economies, the flow of goods and services remains hindered by overly burdensome customs regulations, insufficient use of modern technology in customs, or by other shortcomings. Inefficiently organized and administrated customs procedure cause additional costs when selling or buying goods and services on international markets and can therefore severely impede the competitiveness of firms.

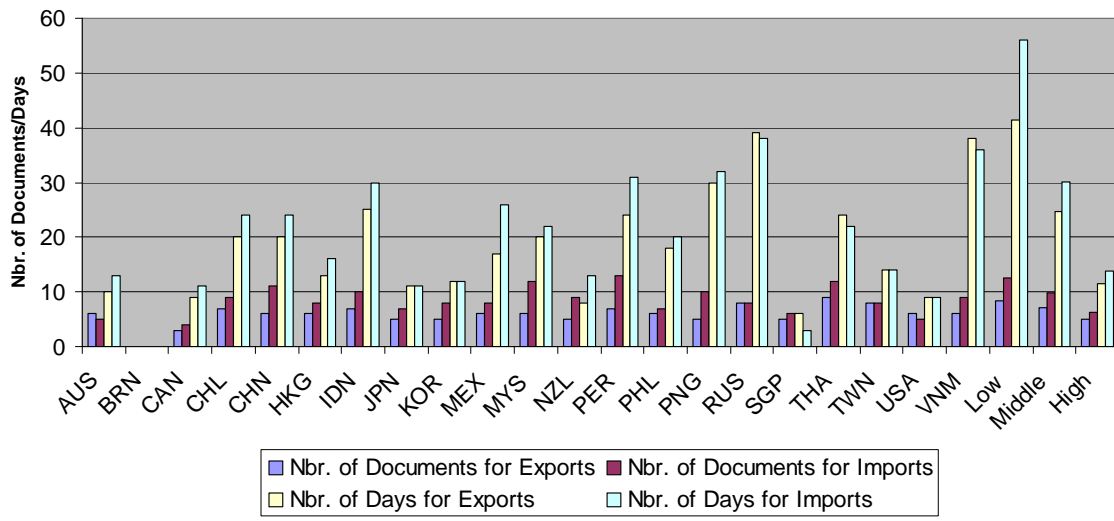
The annual *Doing Business* Report of the World Bank collects, among other data, detailed data on trade facilitation measures that relate to the concept of simplification. For

example, the efficiency of customs is documented in data which record the number of documents as well as the number of days needed for importing or exporting. Fewer documentary requirements, and quicker clearance times, translate into lower administrative costs for exporters and importers. They can also mean lower information costs in terms of understanding the set of steps that must be taken in order to ensure smooth passage through customs and border administrations.

In Figure 4 we present the respective *Doing Business* data for 20 APEC economies (Brunei was not covered by the survey) as well as the average results for the low-, middle-, and high-income groups. The first interesting observation is that the number of documents and days needed for exports are lower in most economies compared to imports. Only in the case of Australia and the USA are more documents required for exports than for imports. Furthermore, only in Russia, Thailand, and Vietnam does the delay for exports exceed the delay for imports. The two low-income economies among the APEC economies, namely Papua New Guinea and Vietnam, require less documentation for exports and imports than the low-income average. Most middle-income APEC economies require a number of export or import documents that is similar to the world average for this income group. The Philippines and Mexico perform particularly well in this comparison. Among the high-income APEC members Canada achieves the best score, asking for only three export and four import documents.

The difference in APEC economies is particularly pronounced concerning the days needed for imports and exports. Several empirical studies have pointed out the importance of timeliness for the trading performance of economies (e.g. Hummels, 2001, Evans and Harrigan, 2005). In a recent World Bank study, Djankov et al. (2006) find that a one day delay before shipping is estimated to reduce trade by 1%. In nearly all APEC high-income economies, the number of days required for imports and exports is lower than the world average for this income group. In particular, Singapore has been very successful in streamlining the customs procedures. The majority of middle-income APEC economies show a similar above-average performance in the category. Furthermore, it is promising to see that Papua New Guinea and Vietnam have clearance times that are similar to the middle-income average and substantially superior to the average of low-income economies.

Figure 4: Number of Days/Documents for Import/Export in the Case of APEC



The LPI also contains two variables which are worthwhile studying in the context of simplification, namely the number of border agencies involved in imports or exports. We expect that fewer agencies will be associated with firms spending less time—and therefore money—on dealing with administrators and ensuring compliance with the separate requirements of each agency. The majority of APEC economies demonstrate a strong performance in this respect (results are not reported). Compared to the three different world averages, they have less border agencies involved in imports than the respective average. Especially Singapore appears to possess a highly efficient structure of customs.

Finally, as mentioned above, the GCR measures the extent to which unofficial payments in imports and exports play a role in an economy. Being obliged to make unofficial payments imposes an extra dimension of costs on exporters and importers. An example is the case when a bribe is required in order to “facilitate” access to the national market, even after payment of official duties and taxes.¹² Looking at the APEC economies (results are not reported), one finds that all high-income economies do better than the

¹² We are aware, however, that the mechanism will not always work in this way. If a bribe is paid in order to avoid official duties, then by assumption it should result in lower nominal trade costs. Nonetheless, the importer or exporter will still need to deal with an added “layer” of costs, in the sense of having to deal with customs agents in order to “negotiate” an acceptable deal.

world average, the only exception being Korea which has a score close to the average of middle-income economies. However, in Indonesia, the Philippines, Russia, as well as Thailand extra payments or bribes connected with import and export permits are apparently widespread.

Table 1 provides an overview of all indicators included in this study, dividing them into predictability and simplification measures. The following section shows how to use these indicators to create an index for exporter and importer transparency.

3.3 Importer and Exporter Transparency Index

In the previous sections we have presented a large number of indicators on the two dimensions of trade policy transparency that we are primarily interested in, namely predictability and simplification. In order to provide a straightforward summary indicator of overall performance against these benchmarks, we will now present results of statistical analysis designed to summarize the above information into just two variables: *importer transparency* and *exporter transparency*. This approach also facilitates the econometric analysis in Section 4, since it makes it possible to avoid technical problems caused by strong correlation among these indicators.

Both importer transparency and exporter transparency are constructed as regional indices on a scale of 0 (lowest) to 1 (highest). Each index is a weighted average of a number of the measures examined above in terms of predictability and simplification. To decide on the weight to be given to each component when taking the average, we use results from a statistical method known as factor analysis.

Factor analysis refers to a set of statistical techniques that can be used to produce an index summarizing performance across a number of correlated indicators. In broad terms, the index is derived by assuming that an unobserved factor (“transparency”) is responsible for the common variation in the original set of indicators. Statistical techniques can be used to identify that unobserved factor in terms of a weighted average of the original indicators (see Table 4 in the appendix for the exact principal factor weights).

This methodology reflects the approach taken by Anderson and Marcouiller (2002) in producing a composite security index, and is close to the principal components

methodology used by Francois and Manchin (2007) to produce summary indices of country performance in the areas of infrastructure and institutions. We prefer the first principal factor to the first principal component because the former allows for variation within the indicator set to be due to both common and individual causes, while the latter assumes that all variation is common.

The above variables are available for all APEC member economies except Brunei Darussalam, Papua New Guinea, and Chinese Taipei. The importer transparency index has more variables than does the exporter transparency index, since there are a number of aspects of transparency (e.g., tariff rate dispersion) that are only relevant from an importing point of view. Final results for the two indices are reported in Figure 5 and Figure 6.

We find that both importer and exporter transparency vary considerably across the region. This is quite in line with expectations, given that APEC as a regional grouping is very diverse. The list of economies with relatively high ITI and ETI scores is unsurprising: Singapore and New Zealand are at the head of both lists. By contrast, Russia and Vietnam arrive at the opposite end of the scale in both cases.

Figure 5 Importer Transparency Index for APEC Economies

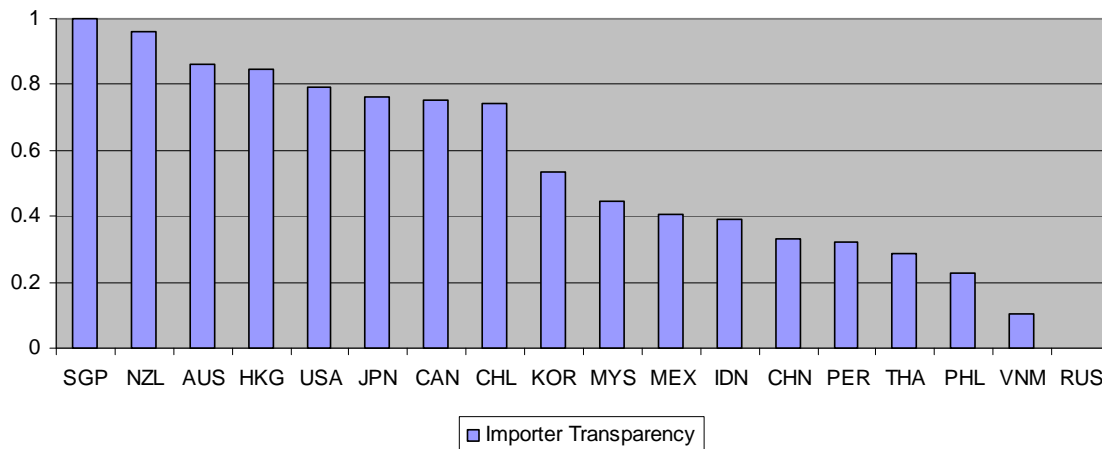


Figure 6 Exporter Transparency Index for APEC Economies

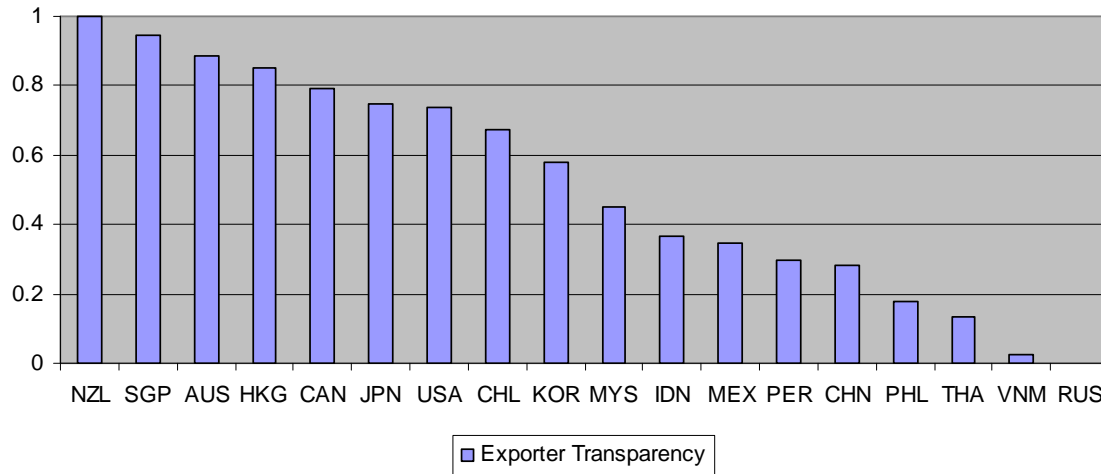


Table 4 shows the ETI and ITI component weights obtained via factor analysis. It is import time, hidden trade barriers, and irregular payments (level and dispersion) that are weighted most strongly in the final ITI. For the ETI, irregular payments (level and dispersion) and export time again stand out as having particularly high weights. Our results therefore suggest that these variables are important determinants of transparency in the trade context. Consequently, if the trade gains from greater transparency are found in the next Section to be significant, then reform efforts might initially be focused in those areas in order to have maximum impact.

4 Transparency and Trade Flows: Estimating the Impacts

In this section, we provide a first assessment of the quantitative impact of transparency on trade flows among APEC economies. To do this, we use the workhorse of empirical international trade work, namely the gravity model. Our approach takes full account of recent developments in the literature in this area, in particular as they relate to four aspects of the model and estimation procedure. First, we derive our empirical specification from the theory-consistent model of Anderson and Van Wincoop (2003, 2004). Second, we use the Poisson estimator to take account of the presence of zeros in the bilateral trade matrix (Santos Silva and Tenreyro, 2006). Another important point relates to our trade policy data: we use highly detailed applied tariff data that take full

account of preferences, as well as ad valorem equivalents of non-tariff. Finally, we use an instrumental variables strategy based on colonial history to deal with the possible endogeneity of transparency with respect to bilateral trade, drawing on the growth and institutions literature (e.g., Acemoglu et al., 2001).

4.1 Empirical Model

Anderson and Van Wincoop (2003, 2004) derive a theoretically consistent gravity model of exports from economy i to economy j in sector k (X_{ij}^k). It takes the following form:

$$\log(X_{ij}^k) = \log(E_j^k) + \log(Y_i^k) - \log(Y^k) + (1 - \sigma_k) \log(t_{ij}^k) - (1 - \sigma_k) \log(P_j^k) - (1 - \sigma_k) \log(\Pi_i^k) + \varepsilon_{ij}^k \quad (1)$$

where: Y_i^k = Output of economy i in sector k ; E_j^k = Expenditure of economy j in sector k ;

Y^k = Aggregate (world) output in sector k ; σ_k = Elasticity of substitution in sector k ; t_{ij}^k

= Trade costs facing exports from economy i to economy j in sector k ; ω_i^k = Economy i 's

output share in sector k ; ω_j^k = Economy j 's expenditure share in sector k ; and ε_{ij}^k =

Random error term, satisfying the usual assumptions. Inward resistance

$(P_j^k)^{1-\sigma_k} = \sum_{i=1}^N \Pi_i^{\sigma_k-1} \omega_i^k (t_{ij}^k)^{1-\sigma_k}$ captures the fact that j 's imports from i depend on trade

costs across all suppliers. Outward resistance $(\Pi_i^k)^{1-\sigma_k} = \sum_{j=1}^N P_j^{\sigma_k-1} \omega_j^k (t_{ij}^k)^{1-\sigma_k}$, by contrast,

captures the dependence of exports from i to j on trade costs across all importers.

Before implementing this model in an empirical setting, we need to specify bilateral trade

costs t_{ij}^k in terms of observable variables. In addition to the ETI and ITI, we include the

importer's applied tariff $(1 + \tau_{ij}^k)$, as well as the ad valorem equivalent of its non-tariff

barriers (ntb_i^k), as calculated by Kee et al. (2006). Additional factors are captured using a

set of bilateral (economy-pair) fixed effects (α_{ij}).

$$\log(t_{ij}^k) = \beta_1 \log(1 + \tau_i^k) + \beta_2 \log(ntb_i^k) + \beta_3 \log(ITI_i) + \beta_4 \log(ETI_j) + \sum_{i \neq j} \alpha_{ij} \quad (2)$$

Substituting (2) into (1) and including sector fixed effects in addition to economy-pair fixed effects gives our baseline estimating equation:¹³

$$\begin{aligned} \log(X_{ij}^k) = & \sum_{i \neq j} \alpha_{ij} + \beta_1 \log(Y_i) + \beta_2 \log(Y_j) + \beta_3 \log(1 + \tau_i^k) + \beta_4 \log(ntb_i^k) + \dots \\ & \dots + \beta_5 \log(ITI_i) + \beta_6 \log(ETI_j) + \sum \gamma_k + \varepsilon_{ij}^k \end{aligned} \quad (3)$$

We estimate (3) using Poisson pseudo-maximum likelihood (Santos Silva and Tenreyro, 2006) in order to take into account the presence of bilateral trade flows that are zero or missing from the dataset. The intuition behind this approach is simple. The first order conditions for Poisson estimation are mathematically equivalent to those for weighted least squares of the non-linear model given by exponentiation of (3). Thus, the potential problem posed by taking the logarithm of zero on the left-hand side is avoided.¹⁴

Our data and sources are set out in full in Table 1. For our baseline results, we use bilateral trade data disaggregated to the HS 2-digit level. Our tariff data come from the MAcMap database (Laborde et al., Forthcoming). MAcMap applied tariffs are bilaterally disaggregated, and take full account of regional agreements and preference schemes. We aggregate the original HS 6-digit data to the HS 2-digit level using a reference group weighting scheme that limits endogeneity problems (Laborde et al., Forthcoming). Essentially, tariffs for economy *i* are weighted by the import patterns of comparable countries, rather than by those of economy *i* itself. We take ad valorem equivalents of non-tariff barriers from Kee et al. (2006)—and aggregate them to the 2-digit level in the same way—while GDP data are sourced from the World Development Indicators. We estimate the model for a cross-section of APEC member economies for the year 2004.

¹³ In fact, this involves a slight simplification. A strict derivation from (1) would imply a large number of additional parameters, including fixed effects in the country-pair-sector dimension and interaction terms between each of the trade cost parameters and the sector fixed effects. See Baldwin and Taglioni (2006) on this and similar points. The expedient we have adopted represents a compromise between theoretical rigor and empirical tractability.

¹⁴ We prefer Poisson to the Heckman sample selection estimator proposed by Helpman et al. (2007) for two largely technical reasons. First, over-identification of the Heckman model is difficult in this context, and the literature does not yet provide a convincing solution to this problem. Second, the first stage probit model on which the Heckman estimator is based can be biased and inconsistent in the presence of standard, unconditional fixed effects (see generally Greene, 2004, on this point). Poisson is one of relatively few non-linear panel data models which do not suffer from this problem, and remain consistent in fixed effects models.

Although it would be desirable to expand our analysis to a panel setting, we are currently constrained by data limitations (in particular the Doing Business, Logistics Perception Index, and MAcMap datasets).

4.2 Estimation Results

Table 5 presents our baseline estimation results. The first column covers all HS Chapters, while the second excludes raw materials (Chapters 1-27) and the third excludes in addition basic manufactures (Chapters 1-83). We find that coefficients generally carry the expected signs and are statistically significant at the 5% level. However, results are noticeably clearer for the trade policy variables in the last two columns when raw materials are excluded. The reason is probably that the markets for agricultural goods and raw materials are often still heavily distorted through different economic policy interventions that are not adequately captured by ad valorem tariffs. For our analysis we therefore focus on the estimation results with this sector excluded.

Moving down column 2, we find that both importer and exporter market size (GDP) are positively associated with bilateral trade, with an income elasticity approaching unity. Similarly, higher bilateral tariffs are associated with reduced trade: it is approximately the case that a 1% cut in applied tariffs is associated with a 2.8% increase in trade. The same applies to non-tariff barriers, although the elasticity is less than half as strong. Finally, the two variables of main interest, namely the ETI and ITI, both have estimated coefficients that are strongly positive and statistically significant. Column 2 suggests elasticities of 6.8 and 8.9 respectively. Indeed, the effects for all dimensions of trade policy, including transparency, would appear to be even stronger on the basis of column 3.

These results suggest that the impact of transparency might be stronger for manufactured goods than for raw materials. To test this hypothesis more extensively, we re-estimate the gravity model separately for differentiated and homogeneous goods. We identify these products using the classification scheme due to Rauch (1999), who divides all products at the 4 SITC digit level into three groups: goods traded on an organized exchange, reference priced goods, and differentiated products. We consider the first two as homogenous products and the later group as bringing together heterogeneous products. Running the same gravity equation on both groups yields the results which are presented

in the last two columns of Table 5. In column (4), where only differentiated products enter the equation, the estimation results appear to support our earlier claim that transparency is of special importance for heterogeneous goods. Column (5) shows that the coefficients decrease considerably when homogeneous goods are considered: the ITI elasticity drops by over two-thirds, while for the ETI the fall is over 50%. Whereas both the ITI and ETI have an economically strong and statistically significant impact on trade flows for differentiated goods, their impact is much weaker and statistically insignificant in the case of homogeneous goods.

In interpreting these results, we have been careful thus far to avoid references to causality. It would not be appropriate to conclude from Table 5, for instance, that improved transparency necessarily “causes” an increase in bilateral trade. This is because simple gravity results like those in Table 5 do not account for possible estimation bias due to the endogeneity of transparency with respect to trade. While Table 5 is consistent with a causal link running from transparency to bilateral trade, it is also consistent with a link running in the opposite direction: i.e., economies may tend to create more transparency trading environments because they have higher trade volumes, which leads to greater pressure for reform. Indeed, it is likely in reality that causation runs in both directions at once, and that improved transparency leads to more intense bilateral trade flows, while more trade also leads to greater transparency.

We adopt a simple instrumental variables technique to try and take account of the probable endogeneity of transparency with respect to bilateral trade. As usual, the principal difficulty lies in identifying an appropriate set of instruments for the ETI and ITI. One possible candidate in this case is colonial history (cf. Acemoglu et al., 2001).¹⁵ Pre-20th Century colonization generally leaves institutional marks on the colonized area, including potentially those institutions most directly affecting the trade policy environment. Indeed, our dataset reveals that in the APEC sample, a dummy variable

¹⁵ Given the relatively small number of countries included in the dataset used here, it proved impossible to effectively implement alternative instrumentation strategies for transparency, such as latitude (Hall and Jones, 1999) or settler mortality (Acemoglu et al., 2001). In future work, we will expand data coverage to include a wider number of countries. We expect this will facilitate the use of alternative instruments, and thereby provide an additional robustness check on the results reported here.

coded so as to capture colonization by Great Britain is strongly positively correlated with our two transparency indices: the simple correlation coefficient is 0.72 for the ITI and 0.74 for the ETI. Since British colonization took place in this region largely in the 18th and 19th centuries, we can be confident that it is exogenous to current (i.e., 2004) bilateral trade flows. We therefore use two dummy variables, one for exporter colonization by Great Britain and another for importer colonization by Great Britain, as instruments for exporter and importer transparency respectively. They are sourced from the CEPII distance database (Mayer and Zignago, 2006).¹⁶

Wooldridge (2002, pp. 663-665) sets out a straightforward methodology for instrumental variables estimation of Poisson models. In the first stage, the endogenous explanatory variables (ETI and ITI) are regressed by OLS on the exogenous explanatory variables (distance, GDP, tariffs, and NTBs) and the instruments (British colonization). The residuals from the first stage regressions are then included as additional regressors in the final Poisson regression.¹⁷ We apply this approach to obtain the results in Table 6, treating ETI and ITI as the only endogenous variables. (For first stage regression results using the full sample, see Table 7.) Tariffs and non-tariff barriers are treated as exogenous in this case, because the reference group aggregation scheme we have used to produce HS 2-digit data means that the endogeneity problem is far more limited than would be the case if, for instance, simple trade weighting had been used.

Moving down column 2, we see that the estimated coefficients on both importer and exporter GDP retain their expected positive signs and are statistically significant at the 1% level, while tariffs and NTBs both impact negatively on bilateral trade. While NTBs are statistically significant at the 5% level, bilateral tariffs are only marginally significant at the 15% level (prob. = 0.151). In both cases, however, the impacts of these variables

¹⁶ It is also necessary for the instruments to be excludable from the gravity regression itself. It is arguable that our colonization dummies satisfy this criterion, since country-pair fixed effects already account for the impact of *common* colonial history, which gravity models often find to be a significant determinant of bilateral trade. However, instrument choice and excludability are important questions for future work in this area to address.

¹⁷ Note that the estimated standard errors have not been adjusted to take account of the use of first stage residuals. Thus, they tend to understate reality.

on trade are economically significant: a 1% tariff cut or reduction on the ad valorem equivalents of NTBs increases bilateral trade flows by around 1%.¹⁸

In terms of our transparency indices, it is primarily the ITI that has a discernable negative impact on trade: a 1% improvement in the economy's index score is associated with a nearly 2% boost to trade. This effect is statistically significant at the 1% level. In the case of the ETI, our results are harder to interpret. Although the coefficient on that variable in column 2 has a negative sign, it does not accord with the logic developed in the rest of this paper to interpret that result literally. Rather, we conclude that the absolute impact of exporter transparency is considerably less than for importer transparency, and thus it is the latter that is likely to be the main variable of economic interest in this context. This interpretation sits well with the general thrust of our regression results in Tables 5-6, where the estimated ETI coefficients more often tend to be positive and/or statistically insignificant. It would also be consistent with the view that it is primarily import market, rather than export market, transparency which matters for bilateral trade. However, this interpretation must be regarded as tentative, and other possible reasons behind the unexpected sign of the ETI coefficient in Table 6 will need to be investigated further in future research on this subject.

Comparing Table 6 with Table 5 suggests that endogeneity of our transparency measures is indeed important, and has the capacity to impact results significantly. For example, the ITI elasticity in column (2) of Table 5 is 8.9, while it is only 1.9 in Table 6. Accounting for reverse causality running from trade flows to transparency can be seen to be important so as to avoid over-estimating the relevant elasticity. This is potentially an important point to be taken up in future research, since standard gravity model formulations tend to treat trade costs as exogenous, rather than potentially endogenous. Use of colonial history as an instrument for institution-related trade costs is just one of many possible

¹⁸ One result on NTBs which is worthy of future research is the unexpected positive sign that its estimated coefficient carries in the final column of Table 6. We suspect that this may be due to the difficulty in measuring NTBs and converting them to ad valorem equivalents in the context of the agriculture and primary products sectors, which represent the bulk of the homogeneous products group used here.

approaches, and we expect that future research will provide greater clarity as to which are the most effective in particular circumstances.

4.3 Simulation of Possible Gains from Improved Trade Policy Transparency

Results from our gravity equation suggest that higher levels of trade policy transparency, particularly in relation to importing, are indeed associated with stronger bilateral trade links. From a policy point of view, it is also important to be able to gauge the strength of that effect relative to other policy options. To provide some first indications in this direction, we now use the gravity model results in column 2 of Table 6 to conduct some simple counterfactual simulations (cf. Wilson et al., 2005). For each simulation, we specify the counterfactual in terms of a given exogenous “shock” to a single policy variable. We then map that shock to trade impacts using the elasticities we have estimated. Comparing impacts from one simulation to another gives an idea of the relative trade gains involved.

Concretely, we consider three simulation scenarios, each of which represents an ambitious but, we believe, feasible medium-term objective within APEC:

- Scenario I: Improve importer transparency within the APEC region such that no economy is below the current regional average (0.54).
- Scenario II: Reduce applied tariffs within the APEC region such that no economy applies a higher level of protection than the regional average for each HS Chapter.
- Scenario III: Reduce the ad valorem equivalents of non-tariff barriers within the APEC region such that no economy applies a higher level of protection than the regional average for each HS Chapter.

In line with our estimations, trade impacts for these scenarios refer to intra-APEC trade only, and exclude raw materials (HS Chapters 1-27). Results show that APEC member economies can indeed boost intra-regional trade significantly by cutting tariffs, reforming NTBs, or promoting transparency. Relative to other ready alternatives, policies aimed at increasing trade policy transparency in the APEC region would appear to have the potential for high impact: improving importer transparency to the regional average is

associated with an increase in intra-regional trade on the order of 7.5%, as compared with only 0.9% for scenario II and 1.8% for scenario III. In monetary terms, these effects equate to approximately US\$148bn, US\$18bn, and US\$35bn respectively.¹⁹

Overall, we conclude that the potential intra-regional trade gains from reform are substantial for all three counterfactual scenarios. This is reinforced by a consideration of the distribution of export and import gains, which shows that certain economies stand to benefit to a level far in excess of the regional average.

Before concluding this Section, it is important to stress that our results, like all simulation results, are subject to a number of caveats. First, we are dealing with trade effects and not economic welfare as such. Second, our results apply only to intra-regional trade in manufactures, and do not take account of possible extra-regional effects. Given that the policy reforms contemplated here—in particular in Scenario I—can be implemented in a non-discriminatory manner, there is considerable scope to produce gains for economies outside APEC as well. Assuming that non-discrimination is adhered to, our results could therefore be interpreted as a lower bound for the likely range of overall (worldwide) effects. Third, our simulations implicitly assume that the elasticities on which they are based remain constant before and after the policy shock. While this may be the case for small policy changes, it is unlikely to hold for major regime shifts. Fourth, our simulations are based on data for the year 2004. As new data become available, we expect that the results for economies having undergone major policy shifts since then—such as WTO accession for Vietnam—may change significantly. Finally, Scenarios II and III do not take account of quantitative restrictions that may represent binding constraints on bilateral trade even once tariffs and other NTBs are lowered.

¹⁹ Region-wide aggregates obscure the fact that these results are subject to considerable heterogeneity across economies. Our results in Table 8 suggest that the import gains from reform tend to be concentrated in a few economies, while the export (market access) gains are spread more widely across the region. Such a distribution is inherent in the design of our counterfactuals: only those economies with transparency, tariff, or NTB scores below the regional average receive a policy “shock”, and therefore only those economies can reap an import gain from reform. However, to the extent that other APEC member economies export to reforming economies, then they can take advantage of a corresponding market access gain.

It is also important to note the issue of cost. Reductions in tariffs and ad valorem equivalents of NTBs impose relatively few direct resource costs on central governments. However, for trade facilitation measures including those aimed at transparency, the cost implications are potentially larger. While we do not have sufficient information available to assess the costs in this case, we would simply highlight that when compared with other trade facilitation measures—such as upgrades of “hard” infrastructure—the cost of improving performance across the set of transparency measures we are dealing with here is likely to involve manageable levels of costs. The government actions required are often legal and administrative in character, along with equipment upgrades in some cases (e.g., e-government readiness), and are therefore unlikely to involve costs on the level of, for instance, a port or road network upgrade. However, the nature of these actions also suggests an ongoing need for technical cooperation and capacity building, since the measures involved are often complex.²⁰

5 Conclusions and Suggestions for Further Research

This paper has drawn on a wide range of objective and perception-based indicators to develop new, quantitative measures of transparency in the trading environment. Our approach is grounded in the view that it is the full range of factors in a country’s trading environment that can influence exporters’ and importers’ incentives—which means that efforts to promote regional and global integration need to address policy reform across a number of areas, not limited to traditional trade policy measures such as tariffs. There is thus an important complementary role to be played by trade facilitation in the broad sense (Wilson et al., 2005).

Taking APEC as a case study, we have used these measures to provide some of the first quantitative evidence suggesting that increasing the transparency of the trading environment through greater predictability and simplification can be an important way of reducing trade costs. We have found that the impact from transparency reforms comes in

²⁰ On the basis of six case studies, including one APEC member economy, McLinden (2006) reports that the costs of implementing improved trade facilitation may be smaller than previously thought. The improvements considered by the author, based on the possible contours of a future WTO agreement, would involve costs ranging from US\$165,000 to US\$1.3m per economy.

addition to the effects stemming from a more liberal stance in respect of “traditional” trade policy measures such as tariffs and quotas. It appears particularly strong for differentiated products. Moreover, our instrumental variables results suggest that our findings are robust to the possible endogeneity of transparency to bilateral trade.

In policy terms, these results are generally supportive of the important place given to transparency both in the multilateral system, and in some regional groupings like APEC. As one means of reducing trade transaction costs, transparency reforms can legitimately be part of the trade facilitation agenda. However, translation of this policy program into concrete reforms would benefit from more detailed research on a number of points.

First, it will be important to identify in greater detail the economic mechanisms at work in particular cases of transparency reform. Here, we have focused on two dimensions—predictability and simplification—that we measure using multiple indicators. By aggregating these indicators via factor analysis, we can produce a summary measure of the overall impact of transparency on bilateral trade. But to inform the details of policy reform, it will be necessary to “unbundle” transparency even further and to examine particular aspects—such as corruption or policy uncertainty—that might be of particular importance in some national contexts. Since transparency reforms are not always politically easy (more on this below), it will be important for this body of research to identify whenever possible the relative economic payoffs from different measures, in order to help policymakers invest their political capital where the economic return is highest.

Second, while this study has focused on the general area of trade in goods, this is not the only domain in which increased transparency could potentially have benefits in terms of regional integration. Issues of regulatory transparency are also crucial in relation to trade in services, and more broadly in terms of regulatory reform affecting services sectors.

However, measuring the extent of barriers to services trade, and quantifying their economic impacts, is an extremely challenging task (see Hoekman, 2006, for a review). This is because such barriers are almost always linked to important issues of “behind-the-border” regulation. Similar comments apply to the issue of international investment flows. Behind-the-border barriers, including transparency-related factors, are important in

understanding the determinants of foreign direct investment. However, just as for services trade, they tend to be extremely difficult in terms of identification and impact assessment. It will therefore be important for future research on transparency to cover all of these dimensions.

Finally, a question as to the mechanics of reform underlies all of the above points. Although increased transparency and regulatory reform might be in the national interest, such moves might be opposed by vested interests and lobby groups. The political economy of reform is thus an important area for future research—including most importantly in relation to corruption and unofficial payments. Corruption does not exist in a vacuum, but is the outcome of a complex set of interactions among traders and officials, taking place against the background of national trade policy choices.²¹ Moving forward on corruption therefore requires detailed analysis of its determinants, as well as on the design of incentive-compatible policy reforms.

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²¹ On this point, see: Fisman and Wei (2004), Gatti (1999, 2004), Javorcik and Narciso (2007), and Fisman and Gatti (2006).

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Tables

Table 1: Summary of Variables Measuring Predictability and Simplification

Predictability	Simplification
<ul style="list-style-type: none"> • Percentage of bound tariff lines (MM) • Standard deviation of applied tariffs (MM) • Absence of “hidden” trade barriers (GCR) • Standard deviation of unofficial payments in imports/exports (GCR) • Spread of import/export delays (LPI) • Favoritism in administrative decisions (GCR) • E-government readiness (UN) 	<ul style="list-style-type: none"> • Number of documents required for import/export (DB) • Number of days required for import/export (DB) • Number of border agencies (LPI) • Unofficial payments in imports and exports (GCR)
Abbreviations: GCR: Global Competitiveness Report, DB: Doing Business, LPI: Logistics Perception Index, MM: MacMap, UN: United Nations E-government Readiness.	

Table 2 Data and Sources

Variable	Description	Year	Source
Bound Lines_i	Measures the percentage of bound lines in the tariff schedule of economy <i>i</i> .	2002-2004	MAcMAP (2007)
Clearance Time_i	Measures the number of days needed for import or export clearance in economy <i>i</i> .	2006	Doing Business (2007)
Colonization UK_i	Dummy variable equal to 1 only if economy <i>i</i> was colonized by Great Britain.	NA	Mayer and Zignago (2006)
E-Readiness_i	Measures the state of e-government readiness of UN Member States in economy <i>i</i> . It is a composite index comprising the Web measure index, the Telecommunication Infrastructure index and the Human Capital index.	2005	United Nations Government E-Readiness (2007)
Favoritism_i	Measures the extent of favoritism in economy <i>i</i> . Based on responses to the question: "When deciding upon policies and contracts, government officials (1=usually favor well-connected firms and individuals, 7=are neutral among firms and individuals)".	2004	Global Competitiveness Report (2005)
GDP Exporter	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates.	2004	World Bank, World Development Indicators (2007)
GDP Importer	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates.	2004	World Bank, World Development Indicators (2007)
Hidden Barriers_i	Measures the extent of favoritism in economy <i>i</i> . Based on responses to the question: "In your country, hidden import barriers (that is, barriers other than published tariffs and quotas) are (1 = an important problem, 7 = not an important problem)".	2004	Global Competitiveness Report (2005)
Imports_{ijk}	Imports of economy <i>i</i> from economy <i>j</i> in sector <i>k</i> . Aggregated at the HS 2 digit level and SITC 4 digit level.	2002-2004	MAcMAP (2007)
Irreg. Paym._i	Measures the extent of irregular payments in economy <i>i</i> . Based on responses to the question: "In your industry, how commonly would you estimate that firms make undocumented extra payments or bribes connected with import and export permits (1=common, 7=never occur)".	2004	Global Competitiveness Report (2005)
No. of Agencies_i	Counts the average number of border agencies involved in imports or exports in economy <i>i</i> .	2006	Logistics Perception Index (2007)
No. Documents_i	Counts the average number of documents needed for imports or exports in economy <i>i</i> .	2006	Doing Business (2007)

Variable	Description	Year	Source
NTB_i (RG Weighted)	Non-tariff barriers in economy <i>i</i> are calculated as the difference between the overall trade restrictiveness index (OTRI) and the trade restrictiveness index (TRI) for each tariff line. It is weighted by reference group weights and converted to logarithm of (1 + NTB).	2001/2004	Kee et al. (2006)
Std. Dev. Irreg. Paym._i	Standard deviation for the answer to the question on irregular payments in economy <i>i</i> .	2004	Global Competitiveness Report (2005)
Tariff_i (RG Weighted)	The tariff rate of economy <i>i</i> is measured as the effective applied MFN rate, which is defined as (specific applied MFN tariff/Unit Value) + ad valorem applied MNF tariff. It is weighted by reference group weights and converted to logarithm of (1 + tariff).	2002-2004	MAcMAP (2007)
Tariff Dispersion_i	Standard deviation of effective applied MFN tariffs in HS 4 digit product groups in economy <i>i</i> .	2002-2004	MAcMAP (2007)
Time Spread_i	Difference between the maximum and minimum number of days for clearance needed for imports or exports in economy <i>i</i> .	2006	Logistics Perception Index (2007)

Table 3 Economies included in the dataset.

Group	Members
Importers	Australia*, Brunei, Canada*, Chile*, China*, Hong Kong China*, Indonesia*, Japan*, Korea*, Malaysia*, Mexico*, New Zealand*, Papua New Guinea, Peru*, Philippines*, Russia*, Singapore*, Chinese Taipei, Thailand*, USA*, Vietnam*.
Exporters	Australia*, Brunei, Canada*, Chile*, China*, Hong Kong China*, Indonesia*, Japan*, Korea*, Malaysia*, Mexico*, New Zealand*, Papua New Guinea, Peru*, Philippines*, Russia*, Singapore*, Chinese Taipei, Thailand*, USA*, Vietnam*.

*Note: * indicates economies included in the effective sample for the regression.*

Table 4: ITI and ETI principal factor weights.

	ITI	ETI
Percent unbound	0.05413	NA
Std. dev. tariffs	0.01701	NA
Std. dev. irreg. pay.	0.18255	0.26815
Std. dev. time	0.0498	0.05531
Lack e-readiness	0.10241	0.14315
Time	0.22514	0.25988
Documents	0.04792	0.03612
Agencies	0.06361	0.14932
Favoritism	0.11891	0.09455
Irreg. payments	0.15849	0.1532
Hidden barriers	0.19511	NA

Note: Time, documents, and agencies refer to import time, number of import documents, and number of import agencies for the ITI, and the corresponding export variable for the ETI.

Table 5 Gravity equation estimation results (baseline). Dependent variable is bilateral trade in levels.

	All goods	HS > 27	HS > 83	Diff. Goods	Homog. Goods
GDP Importer	0.771*** [0.050]	0.844*** [0.060]	0.860*** [0.074]	0.792*** [0.078]	0.691*** [0.053]
GDP Exporter	0.788*** [0.061]	0.933*** [0.068]	0.977*** [0.078]	0.934*** [0.093]	0.596*** [0.063]
Tariff (RG Weighted)	-0.784 [0.488]	-2.807*** [0.921]	-3.132** [1.597]	-0.936 [1.015]	-0.923 [0.691]
NTB (RG Weighted)	0.305 [0.462]	-1.045** [0.434]	-2.034*** [0.663]	-0.069 [0.220]	1.046*** [0.365]
Imp. Transparency	6.886*** [2.028]	8.901*** [2.401]	9.622*** [2.817]	8.371*** [3.324]	2.379 [2.052]
Exp. Transparency	4.842*** [1.655]	6.826*** [2.069]	7.258*** [2.463]	5.170** [2.677]	2.046 [1.745]
Observations	29,376	21,114	4,284	76,500	50,694

Robust standard errors adjusted for clustering by country-pair in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%.

Estimation method is Poisson QML with fixed effects by country pair and HS 2-digit sector.

Table 6 Gravity equation estimation results (instrumental variables). Dependent variable is bilateral trade in levels.

	All goods	HS > 27	HS > 83	Diff. Goods	Homog. Goods
GDP Importer	0.605*** [0.023]	0.596*** [0.016]	0.599*** [0.018]	0.577*** [0.021]	0.641*** [0.028]
GDP Exporter	0.660*** [0.020]	0.745*** [0.017]	0.789*** [0.016]	0.770*** [0.770]	0.557*** [0.026]
Tariff (RG Weighted)	-0.701 [0.588]	-1.421 [0.988]	-2.121 [1.603]	0.138 [1.194]	-0.875 [0.702]
NTB (RG Weighted)	0.414 [0.469]	-0.951** [0.439]	-1.881** [0.805]	0.076 [0.023]	1.057*** [0.367]
Imp. Transparency	1.828*** [0.302]	1.864*** [0.373]	2.583*** [0.401]	3.889* [2.533]	1.987 [2.049]
Exp. Transparency	-0.406 [0.260]	-0.856*** [0.239]	-0.681*** [0.199]	3.071* [2.113]	1.939 [1.749]
Observations	29376	21114	4284	76500	50694

Robust standard errors adjusted for clustering by country-pair in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%.

Estimation method is Poisson QML with fixed effects by country pair and HS 2-digit sector. Importer and exporter transparency are instrumented by British colonization of the importer and exporter.

Table 7 First stage instrumental variable regressions using all observations.

	Imp. Transparency	Exp. Transparency
Col. UK Importer	0.087***	0.407***
	[0.011]	[0.012]
Col. UK Exporter	0.358***	0.105***
	[0.011]	[0.011]
Tariff (RG Weighted)	-0.127***	0.151***
	[0.024]	[0.026]
NTB (RG Weighted)	-0.023	0.031
	[0.021]	[0.022]
GDP Importer	0.040***	0.021***
	[0.004]	[0.004]
GDP Exporter	0.019***	0.046***
	[0.004]	[0.004]
Observations	29,376	29,376
R2	0.75	0.76
Instrument F-Test	4691.78***	5156.51***

Robust standard errors adjusted for clustering by country-pair in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%.

Estimation method is OLS with fixed effects by country pair and HS 2-digit sector.

Table 8 Simulated import and export gains by economy (% of baseline).

	Scenario I		Scenario II		Scenario III	
	Imports	Exports	Imports	Exports	Imports	Exports
AUS	0.00	11.42	0.40	1.11	0.55	2.50
CAN	0.00	1.22	0.08	0.09	0.10	0.50
CHL	0.00	10.69	0.59	0.23	0.36	9.01
CHN	28.99	3.81	2.83	0.83	2.00	1.89
HKG	0.00	16.90	0.00	2.41	0.10	4.60
IDN	20.25	7.71	1.59	1.21	0.06	4.88
JPN	0.00	10.94	0.07	1.83	1.46	1.56
KOR	0.40	14.13	0.92	1.86	0.00	1.38
MEX	17.73	0.48	1.72	0.08	4.04	1.10
MYS	12.13	7.78	3.75	0.63	7.52	1.40
NZL	0.00	5.01	0.10	0.44	2.55	2.55
PER	31.00	2.04	3.88	0.17	0.71	2.53
PHL	47.59	8.21	0.20	0.44	11.15	1.38
RUS	100.66	13.93	5.44	1.50	5.90	1.95
SGP	0.00	12.90	0.00	0.63	7.59	1.32
THA	36.65	8.49	7.62	0.75	0.19	2.87
USA	0.00	8.46	0.03	0.45	1.22	2.12
VNM	73.55	5.41	8.16	1.19	0.00	7.24