



**Asia-Pacific
Economic Cooperation**

Aggregate Measurement of Trade Transaction Costs in APEC 2007-2010

APEC Policy Support Unit
August 2011

Advancing Free Trade for Asia-Pacific **Prosperity**

Prepared by:

ITS Global
Level 1, 34 Queen Street; Melbourne Victoria 3000
Australia

Policy Support Unit
Asia-Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Tel: (65) 6891-9500 Fax: (65) 6891-9690
Email: psugroup@apec.org Website: www.apec.org

Produced for:
Committee on Trade and Investment
Asia-Pacific Economic Cooperation

APEC#211-SE-01.09



This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Singapore License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/sg/>.

The views expressed in this paper are those of the authors and do not necessarily represent those of APEC Member Economies.

TABLE OF CONTENTS

Table of Contents	i
List of Tables	iii
Executive Summary	v
1. INTRODUCTION	1
A. APEC Trade Facilitation Action Plans.....	1
B. Results of Interim Assessment	2
C. Terms of reference for this assignment	2
2. ECONOMIC CONTEXT FOR THE ESTIMATION OF TRADE TRANSACTION COSTS	5
A. Merchandise trade by APEC economies	5
i. Value of merchandise trade	5
ii. Volume of merchandise trade	7
B. Indicators of the transaction costs in merchandise trade.....	8
i. Time taken in merchandise trade	9
ii. Fees & charges incurred in merchandise trade	11
3. ESTIMATES OF TRADE TRANSACTION COSTS	13
A. APEC trade transaction costs	13
i. APEC trade transaction costs by type of cost.....	15
ii. APEC trade transaction costs by logistical stage.....	16
B. Trade transaction costs in APEC economies.....	18
i. Trade transaction costs by type of cost.....	19
ii. Trade transaction costs by logistical stage	19
4. SENSITIVITY TESTS OF CRITICAL ASSUMPTIONS	21
A. Time taken in document preparation.....	22
B. Valuation of transit time in merchandise trade	23
C. Choice of year for trade volume & value weights	25
D. Summary of sensitivity test results.....	26
5. CONCLUSIONS & RECOMMENDATIONS	27
A. Conclusions	27
i. The key results	27
ii. The limitations of the data	28
iii. The uncertainties of the valuation of time	29
iv. Contribution of policy changes.....	29
v. Importance of further early cuts in trade transaction costs.....	30
B. Recommendations	30

LIST OF ANNEXES

ANNEX A: METHODOLOGY & APPROACH USED TO ESTIMATE TRADE TRANSACTION COSTS.....	33
A. Data Sources	34
i. Data on trade transaction costs	34
ii. Other data used in the estimation	36
B. Estimation Procedure	38
i. Overview of approach	38
ii. Exclusion of international freight costs	39
iii. Estimation of monetary costs	39
iv. Estimation of time costs	40
v. Presentation of the results	42
vi. Sensitivity testing	42
ANNEX B: TRADING ACROSS BORDERS INDICATORS.....	43
ANNEX C: ESTIMATES OF TRADE TRANSACTION COSTS	47
ANNEX D: RESULTS OF SENSITIVITY TESTS.....	70
REFERENCES.....	76

LIST OF TABLES

Table 2.1: Value of merchandise trade, by APEC economy, 2006 to 2010, US dollars, 2011 prices	6
Table 2.2: Shipping container movements at major ports by APEC economy, twenty-foot equivalent units (TEU), 2006 to 2010.....	7
Table 2.3: Time taken in APEC merchandise trade by logistical stage, days per TEU movement, 2006 to 2010.....	10
Table 2.4: Fees & charges incurred in APEC merchandise trade by logistical stage, USD per TEU movement, 2006 to 2010, 2011 prices	11
Table 3.1: Trade transaction costs in APEC economies by direction of trade & type of cost, 2006 to 2010, 2006 trade volumes & values, 2011 prices	14
Table 3.2: Share of APEC trade transaction costs by type of cost, 2006 to 2010, 2006 trade volumes & values.....	15
Table 3.3: Share of APEC trade transaction costs by logistical stage, 2006 to 2010, 2006 trade volumes & values.....	17
Table 3.4: Trade transaction costs by APEC economy, 2006 to 2010, 2006 trade volumes & values, 2011 prices.....	18
Table 4.1: Sensitivity tests of preferred estimates of APEC trade transaction costs, 2006 to 2010, 2006 trade volumes & values, 2011 prices	21
Table A.2: Ad valorem tax equivalent of a transit day for all merchandise trade, per cent	37
Table A.2: Implicit GDP Deflator, United States, 2006 to 2011	37
Table B.1: Time taken to complete an import transaction, APEC economies 2006 to 2010 ..	43
Table B.2: Time taken to completed an export transaction, APEC economies, 2006 to 2010	44
Table B.3: Fees & charges incurred on an import transaction, 2006 to 2010, APEC economies, 2011 prices.....	45
Table B.4: Fees & charges incurred on an export transaction, APEC economies, 2006 to 2010, 2011 prices	46
Table C.1. APEC: Transaction costs on merchandise trade, 2006-2010, USD billion, 2011 prices	48
Table C. 2. Australia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	49
Table C.3. Brunei Darussalam: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	50
Table C.4. Canada: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	51
Table C.5. Chile: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	52
Table C.6. People’s Republic of China: Transaction costs on merchandise trade, 2006-2010, USD billion, 2011 prices.....	53
Table C.7. Hong Kong, China: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	54
Table C.8. Indonesia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	55

Table C.9. Japan: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	56
Table C. 10. Republic of Korea: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	57
Table C. 11. Malaysia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	58
Table C. 12. Mexico: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	59
Table C. 13. New Zealand: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	60
Table C. 14. Papua New Guinea: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	61
Table C. 15. Peru: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	62
Table C. 16. The Philippines: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	63
Table C.17. Russia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	64
Table C.18. Singapore: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	65
Table C. 19. Chinese Taipei: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	66
Table C. 20. Thailand: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	67
Table C.21. United States: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	68
Table C. 22. Viet Nam: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices	69
Table D.1. Sensitivity Test 1: Time taken in document preparation, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices	71
Table D.2. Sensitivity Test 2: Hummels alternative valuation of time, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices	72
Table D.3. Sensitivity Test 3: Lower value of transit time, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices	73
Table D.4. Sensitivity Test 4: Higher value of transit time, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices	74
Table D.5. Sensitivity Test 5: Trade volume & value weights, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices	75

EXECUTIVE SUMMARY

The PSU has commissioned ITS Global to prepare estimates of trade transaction costs in APEC for each year from 2006 to 2010. The estimates are to form part of the Final Assessment of TFAP II and are to be based on the methodology and approach that ITS Global had developed for the Interim Assessment of that Plan.

Over this period merchandise trade by APEC economies grew strongly. Their trade rose by a total of 21% in real value and 24% in volume — the latter measured by shipping container movements at major ports. On each measure, the change in exports slightly outstripped that for imports. Given the significant economic differences across the region, individual APEC economies have had vastly different experiences in terms of the evolution of their trade.

Transaction costs are the resource costs incurred in the trading process and should be distinguished from the production costs of what is exchanged — the latter are often referred to as ‘transformation costs’ to underline this distinction. The World Bank publishes global indicators of trade transaction costs, which cover the time and expenses consumed in the trading process.

According to the World Bank indicators, it took 17 days and USD 842 to complete an APEC export transaction in 2006, and 17 days and USD 941 for imports.¹ Over the Assessment period, times have declined by two days for imports (11%) and two days for exports (10%), while fees and charges have risen by 7% for exports and 3% for imports.

Our estimation process uses this information to calculate the economic cost incurred over all merchandise trade in a year. To allow an assessment of how policy change has affected such costs, the impact of any other parameters have to be removed. Hence all estimates are calculated based on constant trade volumes and trade values in real terms over the Assessment period.

Our estimates indicate APEC transaction costs dropped by 5% over this period, implying that APEC has realised the 5% target set by its Leaders at the start of TFAP II. The progress by individual economies was, however, highly uneven. Many did not reach the 5% benchmark and some saw their transaction costs rise in real terms by a substantial margin.

Substantial savings in the costs of time were achieved across the APEC region and there were only a few instances of regression — their importance underlined by the dominance of time costs in the total. Fees and charges, on the other hand, rose strongly in real terms, particularly in ports and terminal handling. Net savings were achieved at most stages in the logistical chain but real transaction costs in Ports and terminal handling rose across the region.

While achievement of the APEC Leaders’ 5% goal looks very much like ‘a close run thing’, the extensive sensitivity testing undertaken by ITS Global indicates that, on balance, the conclusion should be a relatively robust one.

¹ For this purpose, a transaction involves the inwards or outwards movement of a 20-foot shipping container of widely traded merchandise. Except where otherwise indicated, all values in this report are expressed in the prices that prevailed in mid-2011.

The most significant uncertainties relate to the data and the assumptions used to value transit time. The *Trading across Borders* data have limitations and some APEC economies have expressed concerns about them. While ITS Global shares many of these concerns, these data represent the most comprehensive and comparable indicators of trade transaction costs that are publically available. A practical replacement is simply not in sight at this stage.

The other significant uncertainty is the valuation of time. It is most pronounced for the time taken to prepare the documents for customs clearances and other regulatory approvals. It is clear that exporters and importers spend valuable employee time in preparing such documentation but it is unclear how much of this adds to delays in the delivery of the merchandise in question.

For the Final Assessment one half of the time in document preparation is assumed to flow through as a transit delay. This contrasts with the Interim Assessment, which made no such allowance. After reviewing the evidence and consulting with experts, ITS Global considers the assumption used for the Final Assessment to be the more appropriate one and, in the circumstances, a relatively conservative approach to the estimation of trade transaction costs.

While the Leaders' 5% goal has been achieved, this report does not address the issue as to how much TFAP II has contributed to this outcome. This can only be established by a detailed examination of the policy changes made by each APEC economy, the contribution of TFAP II to those policy changes, and the impact of those policy changes on APEC trade transaction costs. Such analyses were outside the scope of this report but are being pursued in parallel work that is being conducted by the PSU.

Trade transaction costs are comparable to trade policy measures in terms of their impact in restricting trade. ITS Global estimates their combined effect is equivalent to a tax of 18.9% on all APEC imports, and one of 18.7% on all APEC exports. As such imposts are serious impediments to economic performance, the case for further cuts in trade transaction costs, and for them to be implemented earlier rather than later, is both clear and compelling for all APEC economies.

In the light of these conclusions, ITS Global makes the following recommendations to APEC:

- Continued monitoring of the evolution of trade transaction costs in APEC economies;
- Regular reviews of the Supply Chain Connectivity Framework Action Plan to ensure appropriate prioritisation of its actions and measures;
- Continued use of the *Trading across Borders* data to estimate trade transaction costs; and
- Implementation of ways and means to improve the quality and transparency of the *Trading across Borders* database.

In addition, ITS Global proposes that complimentary research be undertaken by APEC into:

- The contribution of policy changes to the reduction in trade transaction costs; and
- The economic valuation of the time taken as part of the international trading process.

1. INTRODUCTION

Since its creation in 1989, APEC has been at the forefront of international efforts to facilitate international trade in goods and services.

The leading international organizations, such as the World Bank Group, the World Trade Organization, and the OECD, have concluded that trade facilitation reforms generate significant economic benefits. This reflects the results of published research, which have estimated that the direct costs associated with the international trading process represent up to 15% of the value of trade. Moreover, some researchers have assessed the indirect costs as being as much again.

A. APEC TRADE FACILITATION ACTION PLANS

At their meeting in Shanghai in 2001 APEC Leaders called for a reduction of 5% in APEC trade transaction costs over the four years to 2006. This was to contribute towards the achievement of the Bogor Goals of free and open trade and investment in the region.

Subsequently the Committee for Trade and Investment (CTI) developed APEC's original Trade Facilitation Action Plan (TFAP) to fulfil the Leaders' 2006 goal.

TFAP consisted of a menu of Actions and Measures that were to be taken by APEC members over the following four years. The Actions and Measures addressed four priority areas for trade facilitation reform that had been identified by a survey of APEC business executives:

- Customs Procedures;
- Standards and Conformance;
- Business Mobility; and
- Electronic Commerce.

At Hanoi in 2006, APEC Leaders welcomed the achievement of the 2006 target. Earlier, at their meeting in Busan in 2005, APEC Leaders had called for a further 5% reduction in trade transaction costs over the four years following the original Plan (APEC 2007).

For the Second Plan (TFAP II), the CTI revised the menu of Actions and Measures that had been developed in each of the four priority areas for the original Plan. The Second Plan covered the period from 2007 to 2010 inclusive.

In mid-2009 the Policy Support Unit (PSU) commissioned ITS Global (ITS) to assist it to undertake an Interim Assessment of TFAP II. This involved:

- an examination of the implementation of TFAP II over its first two years of the Plan (2007 and 2008);
- advice on appropriate methodologies and approaches to quantify its impact on trade transaction costs;

- a review of the progress that had been made over the two years towards the Leaders' goal of a 5% reduction in trade transaction costs by the end of 2010; and
- recommendations on the methodology and approach to be adopted for the Final Assessment of TFAP II following its conclusion at the end of 2010.

The PSU presented its final report on the Interim Assessment of TFAP II to the CTI in the middle of 2010.

B. RESULTS OF INTERIM ASSESSMENT

For the Interim Assessment, ITS Global estimated trade transaction costs over the first half of the Plan (2007-08). Its estimates were based on the information The World Bank and International Finance Corporation collect for the *Trading across Borders* component of their annual *Doing Business Report*.

The estimates indicated that APEC had made good progress in reducing total trade transaction costs over the period.

The estimates used the definition of trade transaction costs agreed by the CTI for the Interim Assessment. This is comprehensive and covers transaction costs along the entire logistics chain, including those incurred at, near, or behind the border. At the time of the Interim Assessment TFAP II was mostly focused on reducing transaction costs incurred at or near the border. Although the CTI had yet to implement Actions and Measures along the entire logistics chain, it was at an advanced stage in doing so through the development of APEC's Supply Chain Connectivity Initiative.

To supplement and complement the direct estimates, ITS Global conducted a gravity modelling analysis of APEC merchandise trade flows over the period from 2005 to 2008. This analysis indicated that the principal transaction cost variables had each declined by more than 7% over this period. It also found that these reductions in transaction costs would have led to an increase of around 28% in merchandise trade by APEC economies, had the other determinants of trade not changed.

There were significant uncertainties with both sets of results. The direct estimates are more sharply focussed but relied on the *Trading across Borders* data. While this maximised comparability of the results across APEC economies, there is a question about how accurately they capture transaction costs. On the other hand, the gravity modelling was more expansive but more susceptible to estimation errors.

On balance, ITS Global considered that the direct estimates were the more reliable indicator of the progress that had been made in reducing trade transaction costs in APEC.

C. TERMS OF REFERENCE FOR THIS ASSIGNMENT

At meetings in early 2011, CTI SOM1 endorsed the proposals by the PSU for the conduct of the Final Assessment of TFAP II in the wake of its formal conclusion at the end of 2010. Specifically, the PSU was tasked to prepare the Final Assessment of the Plan so as to

determine whether the Leaders' goal of a 5% reduction in APEC trade transaction costs had been achieved over the four years of the Plan.

For the Final Assessment, CTI SOM1 endorsed the use of the direct estimation methodology, an approach that had been developed for the Interim Assessment of TFAP II and described in the August 2010 report by the PSU to the CTI on that Assessment. As was the case previously, the new estimates are to be based on the time and cost indicators in the *Trading across Borders* database that is maintained by the World Bank Group as part of its *Doing Business* project.

The estimates are to use the definition of trade transaction costs that had been agreed by the CTI in July 2009. This definition explicitly includes the cost of time and other resources that are incurred along the entire logistics chain but excludes those due to tariffs and non-tariff barriers (NTBs), and wholesale and distribution costs.

To assist it in this task, the PSU has commissioned ITS Global to update and extend the estimates of trade transaction costs in APEC economies that ITS Global had prepared previously for the PSU as part of the Interim Assessment. (In parallel the PSU also initiated work on the contribution that the TFAP II actions and measures had made to the change in APEC trade transaction costs over the assessment period.)

This assignment requires ITS Global to:

- estimate the annual transaction costs for each APEC economy and for the APEC region in each trade direction (i.e. in export and in import);
- calculate the trade transaction costs for 21 APEC economies for each of the years in the Final Assessment period from 2006 to 2010 inclusive;
- break down the annual estimates of trade transaction costs by both types of transaction cost (time and monetary cost) and by the four logistical stages in the *Trading across Borders* database;
- conduct sensitivity tests of critical assumptions in deriving the estimates of trade transaction costs; and
- assess whether a 5% reduction in trade transaction costs has been achieved by APEC for the period from 2006 to 2010.

After preparing estimates of APEC trade transaction costs on this basis, ITS Global submitted a draft report to the PSU and the APEC Secretariat for their comments and suggestions. In the light of their comments and suggestions, ITS Global has finalized its report for presentation to the PSU, along with the Excel workbooks that it had used to prepare the estimates.

2. ECONOMIC CONTEXT FOR THE ESTIMATION OF TRADE TRANSACTION COSTS

The economic context in which ITS Global has sought to estimate the trade transaction costs is crucial to the estimates that have been prepared. These, in turn, will shape the results of the Final Assessment of TFAP II and the decisions that CTI will make on the basis of that Assessment.

The economic context for the assignment is dominated by two broad considerations. The first is how the value and volume of merchandise trade by APEC economies has evolved over the Assessment period. The second is the prevalence of transaction costs in both trade directions and how they have changed over the same period. The most comprehensive source of information on this subject is collected for the *Trading across Borders* database that is maintained by the World Bank Group.

Both sets of indicators are critical inputs into the estimation process that ITS Global has used for this assignment.

A. MERCHANDISE TRADE BY APEC ECONOMIES

i. Value of merchandise trade

For each APEC economy, the value of its trade is the principal determinant of the opportunity cost of having merchandise tied up in the international logistics chain. In the case of exports, the process delays receipt of the payment for the goods and in the case of imports, it delays their use or enjoyment. Both parties to a transaction therefore bear a cost if the time taken is longer than necessary.

Table 2.1 summarises the value of merchandise trade — imports plus exports — by APEC economies in each year from 2006 to 2010.² The values in question were sourced from the IMF *Direction of Trade* database (IMF 2011a), which records them in US dollars at current prices. ITS Global has converted these values to real terms — in mid-2011 prices — to provide a more appropriate basis for comparison over time. This was done using the US implicit GDP deflator published by the IMF (2011b) as part of its biannual *World Economic Outlook*.

Over the five years of the Assessment period the total value of merchandise trade by APEC economies grew strongly. In real terms the overall increase was a little over 21%, with a slightly larger rise for APEC exports (23.9%) over its imports (19.1%).

The overall change in the value of APEC merchandise trade represented an average annual growth rate of 5% a year in real terms. The annual changes over the period, however, were not particularly smooth. This is due, in large part, to the sharp contraction in trade that occurred in 2009. This contraction was largely the product of the economic recession that followed in the wake of the Global Financial Crisis of late 2008, particularly in the US, the EU and other developed economies. Despite the apparent severity of this macroeconomic

² This covers *all* merchandise trade, not just the trade *between* the APEC economies.

shock, the recovery, at least as far as APEC trade was concerned, was remarkably rapid, with the total value of APEC merchandise trade for 2010 exceeding its pre-crisis level, at least in nominal terms.

Table 2.1: Value of merchandise trade, by APEC economy, 2006 to 2010, US dollars, 2011 prices

APEC economy	2006 USD billion	2007 USD billion	2008 USD billion	2009 USD billion	2010 USD billion	Change 2006-10 %
Australia	291	332	409	337	431	48
Brunei Darussalam	10	12	13	9	11	13.5
Canada	838	883	933	683	826	-1.4
Chile	101	117	132	98	126	24.7
China, People's Republic of	1,908	2,289	2,638	2,253	3,007	57.6
Hong Kong, China	706	750	774	680	833	18
Indonesia	175	198	274	218	297	69.1
Japan	1,328	1,407	1,592	1,157	1,482	11.6
Korea, Republic of	689	769	888	711	867	25.8
Malaysia	315	340	367	287	421	33.4
Mexico	576	613	650	498	580	0.7
New Zealand	53	61	67	52	63	18.6
Papua New Guinea	10	11	13	12	14	46.4
Peru	43	52	65	51	58	34.5
Philippines, The	107	112	113	87	133	24.3
Russia	460	581	749	455	643	39.9
Singapore	554	593	679	528	672	21.3
Taipei, Chinese	462	490	511	386	526	13.9
Thailand	283	309	362	293	384	35.8
United States	3,203	3,347	3,570	2,715	3,281	2.4
Viet Nam	92	117	148	130	166	80.4
APEC	12,205	13,384	14,946	11,639	14,821	21.4

Source: IMF 2011a & ITS Global estimates

Given the significant economic differences that were evident across the region, individual APEC economies had vastly different experiences over the period in question in terms of the evolution of the value of their merchandise trade.

The APEC economies that enjoyed higher rates of economic growth over this period saw the value of their merchandise trade rise substantially between 2006 and 2010. They include the People's Republic of China (58%), Indonesia (69%), Malaysia (33%), Peru (35%), Thailand (36%), and Viet Nam (80%). The economies that supply their raw materials also benefited. They include Australia (48%) and the Russian Federation (40%).

At the other end of the spectrum, there were APEC economies that experienced much more modest increases in the value of their merchandise trade — or in some cases decreases — over the period in question. This group included Canada (-1.4%), Mexico (0.7%), and the United States (2.4%).

ii. Volume of merchandise trade

Transaction costs in international trade are generally a function of how the transaction is conducted and what is being exchanged. Both interact to determine how the merchandise is moved from the premises of the exporter to those of the importer at the other end of the logistics chain.

The merchandise trade described in the previous section was moved by a variety of transport modes, including sea, road, pipeline, and air. Of these, shipping dominated in terms of both weight and value, although the share by value was substantially less than that by weight.

Table 2.2: Shipping container movements at major ports by APEC economy, twenty-foot equivalent units (TEU), 2006 to 2010

APEC economy	2006 million TEU	2007 million TEU	2008 million TEU	2009 million TEU	2010 million TEU	Change 2006-10 %
Australia	5.10	5.53	5.01	5.61	5.84	14.6
Brunei Darussalam	0.08	0.08	0.09	0.08	0.09	10.4
Canada	4.03	4.16	4.35	3.74	4.28	6.3
Chile	1.96	2.44	2.66	2.33	2.61	33.2
China, PR of	74.73	90.81	99.98	93.14	110.43	47.8
Hong Kong, China	12.95	13.20	13.34	11.57	13.03	0.7
Indonesia	5.68	6.31	6.79	6.65	8.48	49.3
Japan	14.56	15.23	15.25	12.40	14.57	0
Korea, Republic of	9.35	10.28	10.49	9.49	11.22	20
Malaysia	4.45	4.92	5.28	4.96	5.79	30.1
Mexico	2.39	2.67	2.67	2.15	2.76	15.3
New Zealand	1.72	1.94	1.37	1.97	2.02	17.5
Papua New Guinea	0.07	0.09	0.09	0.07	0.09	17.7
Peru	1.04	1.13	1.34	0.96	0.87	-16.4
Philippines, The	3.46	3.67	3.77	3.45	4.05	17
Russia	2.27	2.89	3.25	2.15	2.65	16.8
Singapore	4.71	5.31	5.68	4.91	5.40	14.7
Taipei, Chinese	6.92	7.24	6.80	5.63	6.14	-11.2
Thailand	5.57	6.20	6.59	5.76	6.52	17
United States	30.88	31.45	29.70	25.95	30.41	-1.5
Viet Nam	2.79	3.78	4.21	4.38	4.74	69.8
APEC	194.71	219.36	228.69	207.37	241.98	24.3

Source: Informa 2011 & ITS Global estimates

For most merchandise trade, the basic transactional unit is the shipping container or box that is used to move the merchandise from the premises of the consignor to those of the consignee. By convention, shipping container volumes are measured in terms of the standard twenty-foot equivalent unit (TEU). Non-containerised trade is moved in specialised ships as bulk or break bulk cargoes.

Table 2.2 has total TEU movements — inwards plus outwards movements — at the major sea ports of APEC economies. Wherever possible, transshipments at the ports in question have been excluded from the figures. This trade is generally the subject of minimal regulation by government customs and border agencies in APEC economies and is not particularly relevant to the estimation of trade transaction costs.

Until the recent economic downturn, an increasing share of the value of global trade was shifting from sea to air carriage, although the share of trade by weight that is being carried by air is insignificant. The leading edge of this structural shift has been in the United States where around one half of merchandise trade was being carried by air. Due to a lack of consistent and reliable information on the movement of merchandise by air, however, container movements by air are not included in Table 2.2.

The figures in Table 2.2 indicate that total container movements increased by about 24% on average. This was somewhat more than the increase in the real value of merchandise trade over the period but this relativity is broadly consistent with that in the equivalent trends at the global level. As was the case with the value of APEC trade, the increase in the outwards container movements (26%) exceeded that for inwards movements (22%).

The pattern observed in the value of trade by APEC economies was also largely reproduced with that in container movements. The most substantial changes in the number of movements over the period were evident in the People's Republic of China (48%), Chile (33%), Indonesia (49%), Malaysia (30%), and Viet Nam (70%), while some economies experienced a reduction in movement numbers.

B. INDICATORS OF THE TRANSACTION COSTS IN MERCHANDISE TRADE

Transaction costs are the resource costs – that is the land, labour, capital, and time – that are incurred in searching out, negotiating, and completing an economic exchange. They should be distinguished from the costs of producing what is exchanged, which are sometimes referred to as ‘transformation costs’ to underline the distinction.

In international trade, transaction costs are incurred at every stage along the supply chain. They include the cost of activities such as:

- negotiation of the sales contract;
- preparation the relevant documentation to customs and other government agencies;
- presentation of the documentation to the agencies in question;
- payment of any taxes, fees and charges imposed on the transaction;
- transporting the merchandise to the port, usually in stages;
- shipping the merchandise internationally; then
- repeating the processes of document preparation and presentation, internal transport and handling at the importing end of the chain.

Only after these costs have been incurred can the merchandise in question be delivered to the purchaser.

Many transaction costs are attributable either to processes that are undertaken by government agencies or by the private sector to comply with government regulation. The World Bank Group (2011) collects indicators of business regulation and its impact on business for its *Doing Business Index* that is published each year as part of their suite of *Doing Business Reports*.

For the *Trading across Borders* component of this Index, the World Bank Group collects data for a series of indicators of the regulatory impediments to international trade. This is done by an annual survey of business people and government officials involved in international logistics. For the *Doing Business 2011 Report*, the *Trading across Borders* survey collected raw data from 1,279 respondents in 183 economies (World Bank Group 2010). Annex A has details of the survey approach and how representative it is.

To ensure the comparability of the results across economies and over time, the *Trading across Borders* surveys are based on a standardized, hypothetical cargo of widely-traded and non-perishable merchandise moving between the largest business city and its nearest container port.³ The standardized cargo used is the same for both export and import.

The survey responses identify every official procedure, along with the time taken to complete each stage in the logistics chain and the fees and charges that are incurred by the exporter or importer in the process. For this purpose the logistics chain is broken into four stages:

- Document preparation;
- Customs clearance and technical control;
- Ports and terminal handling; and
- Inland transport and handling.

The World Bank explicitly excludes the cost of international shipping as well as any tariffs or duties that might be levied on the cargo.

The World Bank has provided fully disaggregated information on all the indicators in its *Trading across Borders* database to the PSU for the Final Assessment. This information relates to each of the APEC economies for the period from 2006 to 2010. The data in question have been extensively revised by the Bank from what the Bank had originally collected and published as part of its suite of *Doing Business* publications. The key indicators for the APEC economies from 2006 to 2010 are presented in Annex B. An overview of this information is presented below.

i. Time taken in merchandise trade

Table 2.3 summarises the time taken in APEC to complete the procedural requirements for all the logistical stages outlined above over the period from 2006 to 2010. The time taken is broken down by logistical stage for inwards container movements (which carry imports) and

³ For some APEC economies, notably Canada, the Russian Federation and the United States, this port is not on their Pacific coast.

for outwards movements (which carry exports). Each indicator is a simple average of the relevant values for all APEC economies.

Out of the time taken to complete the procedural requirements in APEC in 2010, Document preparation accounted for 57% of inwards and 55% of outwards container movements. The balance was distributed more or less evenly over the other three logistical stages in each direction, at around 14% of the total in each case.

Table 2.3: Time taken in APEC merchandise trade by logistical stage, days per TEU movement, 2006 to 2010

Logistical stage	2006	2007	2008	2009	2010	Change 2006- 10 %
Imports	17.2	16.5	16.1	15.7	15.2	-11.2
Document preparation	9.9	9.4	9.2	9	8.7	-12.5
Customs clearance & technical control	2.7	2.4	2.3	2.2	2.1	-22.8
Ports & terminal handling	2.6	2.6	2.6	2.6	2.6	-0.9
Inland transport & handling	2	2.1	2	1.9	1.9	-2.4
Exports	16.7	16.1	15.8	15.7	15	-10.3
Document preparation	8.9	8.7	8.6	8.6	8.3	-6.5
Customs clearance & technical control	2.1	2.1	2.2	2.1	1.8	-17.8
Ports & terminal handling	2.3	2.3	2.3	2.3	2.4	2
Inland transport & handling	3.4	3	2.7	2.6	2.6	-23.9

Source: World Bank Group 2011 & ITS Global estimates

The figures in Table 2.3 indicate that the average time taken to complete the procedural requirements in the logistics chain has declined by two days (-11.2%) for inwards movements and by two days (-10.3%) for outwards movements across APEC. These are the simple averages for the 21 economies rather than the weighted averages.

The time taken declined at all logistical stages except for Ports & terminal handling (for outwards movements only) where the time taken increased by 2%. There were significant declines in the time taken in Customs clearance and technical control for both inwards (-23%) and outwards movements (-18%), in Inland transport and handling for outwards movements (-24%), as well as in Document preparation for inwards movements (-13%).

The APEC economies which experienced substantial decreases in the time taken for inwards movements included the Republic of Korea by 5 days (-42%), Mexico by 5 days (-29%), Peru by 12 days (-41%), the Philippines by 4.5 days (-24%), and Thailand by 9 days (-41%). Those with substantial decreases in the other direction included Indonesia by 5 days (-20%), Korea by 4 days (-33%), Peru by 10 days (-46%) and Thailand by 10 days (-42%).

Brunei Darussalam is the only economy which recorded an increase in time taken of over 5% for inwards movements.

On the other hand thirteen APEC economies did not experience any change in time taken for either inwards or outwards movements. They were: Australia; Canada; Chile; China; Hong Kong, China; Japan; Malaysia; New Zealand; Papua New Guinea; the Russian Federation; Singapore; Chinese Taipei; and the United States.

ii. Fees & charges incurred in merchandise trade

Tables 2.4 summarises the fees and charges incurred in APEC economies in completing the procedural requirements for all four logistical stages. The fees and charges are denominated in US dollars and are broken down by inwards and outwards movements. To facilitate appropriate comparisons over time they have all been converted to 2011 prices using the US implicit GDP deflator published by the IMF (2011).

In 2010 fees and charges in Inland transport and handling accounted for the largest share of total fees and charges on inwards movement (39%) and on outwards movements (40%) in APEC. Fees and charges in Ports and terminal handling accounted for 28% in both directions, while those in Document preparation accounted for 20% in both directions. Total fees and charges for inwards movements were higher than for outwards over all logistical stages.

Over the period in question, the fees and charges incurred in inwards movements decreased by 2%, while those incurred in outwards movements rose by 2% in real terms. Again these are the simple averages of the 21 individual results.

Table 2.4: Fees & charges incurred in APEC merchandise trade by logistical stage, USD per TEU movement, 2006 to 2010, 2011 prices

Logistical stage	2006	2007	2008	2009	2010	Change 2006- 10 %
Imports	941	884	964	944	923	-2
Document preparation	193	160	198	190	181	-6.1
Customs clearance & technical control	113	109	126	122	118	4.5
Ports & terminal handling	254	249	267	265	259	2
Inland transport & handling	381	366	373	367	364	-4.5
Exports	842	810	889	874	856	1.7
Document preparation	163	142	184	185	175	7.5
Customs clearance & technical control	87	93	98	98	96	9.5
Ports & terminal handling	222	230	244	245	240	8.3
Inland transport & handling	370	345	363	347	345	-6.7

Source: World Bank Group 2011 & ITS Global estimates

The picture for fees and charges over the logistical stages, however, was quite varied. Those incurred at Customs clearance and technical control experienced the greatest real increase (9.5%), which was for outwards container movements. The fees and charges in Document preparation decreased for inward movements (-6%), but increased for the outwards movements (8%) over the period — with even sharper increases, of 23% and 29% respectively, in 2008.

Fees and charges in Ports and terminal handling increased for both imports (2%) and exports (8%), but decreased for both inwards movements (-5%) and outwards movements (-7%) in Inland transport and handling.

The economies that experienced the greatest real declines in fees and charges on inwards container movements included the Republic of Korea (-29%), the Philippines (-15%) and Thailand (-29%). For the outwards movements, they included the Philippines (-21%), Chinese Taipei (-19%) and Thailand (-31%).

Peru recorded the largest real rise in its fees and charges over the period in question, both for imports (23%) and exports (40%). Other APEC economies that had substantial increases in their fees and charges for imports included Brunei Darussalam (12%), the People's Republic of China (18%) and Singapore (12%). Those with significant increases in fees and charges on exports included Brunei Darussalam (14%), the People's Republic of China (20%) and Indonesia (20%).

Only six APEC economies — Japan, Republic of Korea, the Philippines, the Russian Federation, Chinese Taipei and Thailand— experienced a decrease in real fees and charges for both inwards and outwards movements.

3. ESTIMATES OF TRADE TRANSACTION COSTS

Conceptually direct estimation involves multiplying the unit value of each transaction cost component in each APEC economy by the volume of transactions to which the component relates. Their product gives the cost of that component for the economy in question. Summing the components gives the total for the economy and summing the economy-level estimates gives the total for the APEC region.

As we have seen there are two basic types of transaction costs consumed in completing any trade transaction — material resources and time. Both are incurred in meeting the various requirements that APEC economies impose on the trading process. They include the preparation and presentation of documentation to the relevant government agencies, such as the customs service, as well as the presentation of the merchandise in question for its physical inspection by those agencies.

Direct estimation seeks to measure the economic value of the material resources and time that were consumed at every stage in the process of getting the goods from the exporter's premises to the wharf-side or from the wharf-side to the importers premises, as the case may be. The methodology and approach that were used are described in detail in Annex A and the key data were discussed in Chapter 2.

A. APEC TRADE TRANSACTION COSTS

Table 3.1 reports the estimates of transaction costs incurred on merchandise trade by all APEC economies for the base year (2006) of the Assessment, as well as for each year of TFAP II programme (2007 to 2010 inclusive). The Table breaks the annual totals down by the direction of trade and the type of transaction cost. The breakdown of the totals by logistical stage is discussed later in the Chapter. The more detailed estimates are in Annex C. It includes a breakdown of the totals for both APEC and each APEC member by direction of trade, logistical stage, and type of cost.

Between 2006 and 2010, trade transaction costs in APEC declined by 5.0% in real terms, which represents a fall in costs of USD 58.7 billion in 2011 prices. The overall decline in APEC costs was made up of broadly similar reductions for imports (-5.3%) and APEC exports (-4.6%). Taken at face value, these results indicate that the APEC Leaders' goal of a 5% reduction in trade transaction costs has been achieved.

It is important to note that all the transaction cost estimates were prepared on the basis of constant trade volumes, trade values, and prices. This is necessary to prevent variations in any of those parameters distorting the Final Assessment.

The Assessment is concerned with whether the *rate* at which transaction costs were imposed in APEC economies over the period in question have been reduced by 5%. It is not concerned about the observed changes in total transaction costs that are due to changes in trade volumes, trade values, or the value of the monetary unit used to measure transaction costs. For this reason, the impact of such changes has to be explicitly removed from the estimates.

Table 3.1: Trade transaction costs in APEC economies by direction of trade & type of cost, 2006 to 2010, 2006 trade volumes & values, 2011 prices

Type or transaction cost	2006 USD billion	2007 USD billion	2008 USD billion	2009 USD billion	2010 USD billion	Change 2006-10 %
Imports						
Fees & charges	70	65	73	73	72	3
Time taken	532	517	510	501	498	-6.3
Exports						
Fees & charges	61	59	65	67	66	6.9
Time taken	524	513	501	500	492	-6
All trade	1,187	1,154	1,149	1,141	1,128	-5.0
Fees & charges	131	125	138	139	138	4.8
Time taken	1,055	1,029	1,011	1,001	990	-6.2

Source: World Bank Group 2011 & ITS Global estimates

For these reasons the estimates prepared for this report do not align with estimates calculated on the basis of current or outturn values — that is, the outcomes observed each year in terms of trade volumes, trade values, and the general level of prices. Estimated on this basis, APEC trade transaction costs were USD 0.9 trillion in 2006 and USD 1.3 trillion in 2010. While this implies that transaction costs increased by 34.5% over the period, such a conclusion would be misleading. This is due to the fact that, in parallel, the price level increased by 8.3%, trade volumes by 24%, and trade values by 21%. Strictly speaking these two estimates are not comparable to each other or to the estimates presented in Table 3.1.

In 2010 the *ad valorem* tax equivalents of the estimates in Table 3.1 — the transaction costs expressed as a percentage of the value of the underlying merchandise trade — were broadly comparable at 9.0% for imports and 9.5% for exports. In part the lower *ad valorem* rate for imports reflects the fact that, by convention, the landed value of imports includes the cost of international freight and insurance, whereas exports are valued on a ‘free on board’ (f.o.b.) basis.

In the case of intra-APEC trade, these results imply that the overall burden on the average trade transaction would be of the order of 18.5% of its value.⁴ In specific rate terms these transaction costs were the equivalent of around USD 11,600 per TEU movement.

There was, however, some variation in the components that made up the APEC result, although the pattern was broadly similar across them. Over the period, the real cost of the time taken declined (-6.2%), although by somewhat more for imports (-6.3%) compared to exports (-6.0%). In contrast fees and charges generally rose in real terms (4.8%) but there were significant divergences between the outcomes for exports (6.9%) and imports (3%).

⁴ This is only approximate as the export costs are expressed as a percentage of the ‘free on board’ value of the merchandise in question and the import costs as a percentage of that plus the cost of insurance and international freight. In other words, 9.5% of f.o.b. price + 9.0% of c.i.f. price \approx 18.5% of c.i.f. price.

While the APEC Leaders' 5% goal looks to have been realized, the estimates highlight both the sheer magnitude of trade transaction costs in APEC and their opacity. In 2010 aggregate trade transaction costs cost the APEC economies around USD 1.1 trillion a year.

The fact that transaction costs on intra-APEC trade constitute 18.5% of the cost of goods at the point of importation does not take into account the impact of any tariffs or non-tariff measures that might be imposed by the government of the importing economy. Nevertheless, such implicit tax rates are likely to have considerable significance for international trade and investment flows and, by implication, for the economic performance of APEC economies.

i. APEC trade transaction costs by type of cost

As the figures in Table 3.2 show, the composition of APEC trade transaction costs was heavily dominated by the time that was taken to complete merchandise trade transactions. In 2010 fees and charges accounted for only 12.2% of all APEC trade transaction costs.

The dominance of the cost of time was distributed over exports and imports more or less evenly — in 2010 time taken accounted for 88% of the costs of export transactions and 87% of those for import transactions. In each case, however, the relative importance of time taken is declining, albeit slowly. This is largely due to distinctly contrary trends in each of the cost components.

Table 3.2: Share of APEC trade transaction costs by type of cost, 2006 to 2010, 2006 trade volumes & values

Component	2006 %	2007 %	2008 %	2009 %	2010 %	Change 2006- 10 % point
Imports						
Fees & charges	5.9	5.7	6.3	6.4	6.4	0.5
Time taken	44.8	44.8	44.4	44.0	44.1	-0.7
Exports						
Fees & charges	5.2	5.1	5.6	5.8	5.8	0.6
Time taken	44.1	44.4	43.6	43.8	43.7	-0.5
All trade	100.0	100.0	100.0	100.0	100.0	
Fees & charges	11.1	10.8	12.0	12.2	12.2	1.1
Time taken	88.9	89.2	88.0	87.8	87.8	-1.1

Source: World Bank Group 2011 & ITS Global estimates

The increase in fees and charges over the period for 2006-10 added USD 6.3 billion to annual transaction costs in APEC, whereas the fall in time taken represented a saving of USD 65.0 billion. The latter was solely responsible for the cut in APEC transaction costs over the period.

This pattern was repeated for each trade direction at the APEC level, although the size of the changes varied, particularly across the four logistical stages.

Declines in time costs were evident on three of the four logistical stages — Documentation preparation (-8.7%), Customs clearance and technical control (-8.1%) and Inland transport and handling (-8.4%). Their combined impact on total transaction costs was partially offset by an increase in the cost of time taken in Ports and terminal handling (4.3%).

A similar pattern was observed in fees and charges but it was exactly opposite in nature. The increases in fees and charges occurred in Documentation preparation (15.8%) and Customs clearance and technical control (6.3%) and Ports and terminal handling (3.8%). Again their collective impact on total transaction costs was partially offset by declines in fees and charges in Inland Transport and handling (-2.1%).

The most encouraging feature of these results is that, for APEC as a whole, the reduction in the real cost of time was more than enough to counteract the impact of the strong rise in fees and charges. Other things being equal, the reduction in the time costs would have cut APEC trade transaction costs by 5.5 percentage points over the Assessment period.

Of the gross savings in time costs of USD 73 billion over the period, USD 55.5 billion (or 75%) of the savings occurred in Document preparation and Customs clearance and technical control. On the other hand, these two logistical stages also accounted for most of the gross increase of USD 6.1 billion in aggregate fees and charges over the period.

This sharply contrasting experience raises the possibility that some or all APEC governments may have funded any public expenditure that was associated with their accelerating official processing times for trade transactions through higher fees and charges.

Given the importance of the time taken in the estimates, the assumptions that were used to value it are critical to the estimated reduction in trade transaction costs at the APEC level over the Assessment period. Consequently ITS Global has subjected each of these assumptions to extensive sensitivity testing. The nature of the tests and the results that were obtained with them are discussed later in this report.

ii. APEC trade transaction costs by logistical stage

Table 3.3 sets out the share of APEC trade transaction costs in each logistical stage for each year of the Assessment period. The stages used here are taken from the World Bank's *Trading across Borders* database.

Document preparation clearly dominates the distribution of trade transaction costs over the logistical stages at the APEC level, accounting for (42%) of the costs in both directions of trade in 2010. In that year it was followed, in rank order, by Inland transport and handling (22%), Ports and terminal handling (21%), and Customs clearance and technical control (16%). The distribution of transaction costs over the logistical stages in export was virtually identical to that over the same stages in import.

The evolution of cost shares by logistical stage over the Assessment period has exhibited a somewhat similar pattern across trade in aggregate as well as both directions. At the aggregate level, loss of share occurred in Document preparation (-0.97 percentage points) and Customs clearance and technical control (-0.34 percentage points), while gains were evident

in Ports and terminal handling (1.82 percentage points) and Inland transport and handling (0.51 percentage points).

TFAP II — and its predecessor — have tended to concentrate on reducing transaction costs in just two of the four logistical stages covered by the estimates. The stages in question are: Document preparation; and Customs clearance and technical control. Together they accounted for just over half of all the APEC trade transaction costs that ITS Global estimated for 2010.

The estimates indicate that the dollar value of transaction costs at these two stages across the region declined by 7.1% in real terms between 2006 and 2010. The cuts were significantly sharper for imports (-9.0%) compared to exports (-4.8%). For both trade directions, however, the reduction in the real cost of time (-8.5%) and its dominance of total costs were responsible for the aggregate saving, as fees and charges rose strongly in real terms (12.7%).

As was the case by type of transaction cost, the overall distribution of the changes at the aggregate level was similar to that in each of the trade directions.

Table 3.3: Share of APEC trade transaction costs by logistical stage, 2006 to 2010, 2006 trade volumes & values

Logistical stage	2006 %	2007 %	2008 %	2009 %	2010 %	Change 2006- 10 % point
Imports	50.7	50.4	50.7	50.3	50.5	-0.17
Document preparation	22.2	21.6	21.8	21.2	21.2	-0.97
Customs clearance & technical control	9.1	8.7	8.7	8.7	8.7	-0.37
Ports & terminal handling	9.1	9.3	9.3	10.0	10.1	0.96
Inland transport & handling	10.3	10.9	10.9	10.4	10.5	0.21
Exports	49.3	49.6	49.3	49.7	49.5	0.17
Document preparation	20.5	20.8	20.4	20.7	20.5	0.00
Customs clearance & technical control	7.2	7.4	7.5	7.4	7.3	0.03
Ports & terminal handling	9.7	10.2	10.3	10.5	10.6	0.86
Inland transport & handling	11.8	11.2	11.0	11.1	11.1	-0.73
All trade	100	100	100	100	100	
Document preparation	42.7	42.4	42.2	41.9	41.8	-0.97
Customs clearance & technical control	16.3	16.0	16.2	16.2	16.0	-0.34
Ports & terminal handling	18.8	19.5	19.7	20.5	20.6	1.82
Inland transport & handling	22.1	22.1	21.9	21.4	21.6	-0.51

Source: World Bank Group 2011 & ITS Global estimates

B. TRADE TRANSACTION COSTS IN APEC ECONOMIES

Table 3.4 has a summary of the estimates of transaction costs incurred in *all* merchandise trade by each of the 21 APEC economies for each year of the Assessment period. Annex C has the complete results for each APEC economy. In each case the Annex breaks down the transaction cost estimate by the four logistical stages, the two trading directions — exports and imports, and the two types of transaction cost — fees and charges, on the one hand, and the value of the time taken, on the other. This reflects the disaggregation that has been used previously.

Exactly two-thirds of the APEC membership — 14 economies — experienced a real decline in their trade transaction costs over the Assessment period. Nevertheless, the outcomes that individual APEC economies registered in this regard over the period in question covered an extremely broad range.

Table 3.4: Trade transaction costs by APEC economy, 2006 to 2010, 2006 trade volumes & values, 2011 prices

APEC economy	2006 USD billion	2007 USD billion	2008 USD billion	2009 USD billion	2010 USD billion	Change 2006-10 %
Australia	36	36	37	36	36	-0.1
Brunei Darussalam	2	2	2	2	2	-6.8
Canada	68	69	70	70	70	2.8
Chile	16	16	16	19	18	16.1
China, PR of	288	287	294	295	294	2.2
Hong Kong, China	45	42	43	43	43	-5.6
Indonesia	30	27	27	27	27	-12.7
Japan	140	139	139	139	139	-0.6
Korea, Republic of	73	64	52	52	50	-31.5
Malaysia	30	31	31	31	31	1.2
Mexico	62	61	61	53	52	-16.5
New Zealand	6	6	6	6	6	0.7
Papua New Guinea	9	8	8	8	8	-7.9
Peru	21	21	22	21	15	-31.1
Philippines, The	13	13	12	12	10	-21.3
Russia	77	76	77	77	76	-0.2
Singapore	21	21	21	21	21	0.7
Taipei, Chinese	41	41	41	41	41	-0.3
Thailand	45	32	28	28	28	-39.1
United States	148	148	148	148	148	0.2
Viet Nam	15	15	15	14	14	-7.3
All APEC economies	1,187	1,154	1,149	1,141	1,128	-5.0

Source: World Bank Group 2011 & ITS Global estimates

The extent of the variations in the estimated changes at the level of individual economies strongly suggest that policy change did help to shape both the estimated decreases in transaction costs over the period as well as the estimated increases.

A total of 10 APEC economies posted reductions in their transaction costs that were in excess of the 5% benchmark set by APEC Leaders at the start of TFAP II. The group consists of: Brunei Darussalam; Hong Kong, China; Indonesia; the Republic of Korea; Mexico; Papua New Guinea; Peru; the Philippines; Thailand; and Viet Nam.

Between them these 10 economies realized net savings of USD 69 billion from reductions in their transaction costs over this period. In 2010 they accounted for 22% of the value of all APEC merchandise trade.

Four APEC economies realised real cuts in trade transaction costs that were less than the 5% benchmark set by the APEC leadership — Australia, Japan, the Russian Federation, and Chinese Taipei — and seven had real increases — Canada, Chile, the People's Republic of China, Malaysia, New Zealand, Singapore, and the United States. The majority of the economies in these two categories, however, have only seen relatively small changes in their transaction costs in real terms, with the changes ranging between -0.6% and 0.7%.

i. Trade transaction costs by type of cost

In ten of the 14 APEC economies that experienced a real decline in their total trade transaction costs, the change was largely, if not solely, due to a reduction in their real time costs. Brunei Darussalam; Canada; Chile; China; Hong Kong, China; Indonesia; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; Singapore; the United States; and Viet Nam saw their fees and charges increase in real terms. In most cases, however, the dominance of time costs in total transaction costs was such that even a modest rate of decline in the time taken was more than enough to outweigh the impact of the increase in real fees and charges.

Only the Republic of Korea, the Philippines, and Thailand experienced real cuts in both time and material resource costs. Between them they made overall savings in transaction costs of USD 43.5 billion a year but the biggest savings were in time taken (USD 39.4 billion).

A total of nine APEC economies saw no change in their time costs — Australia, Chile, China, Japan, New Zealand, the Russian Federation, Singapore, Chinese Taipei, and the United States — and only two APEC economies had real increases in time costs — Canada, and Malaysia.

ii. Trade transaction costs by logistical stage

In most APEC economies the direction of the change in their transaction costs varied across the four logistical stages, as well as in each direction of trade.

Only three APEC economies experienced reductions in transaction costs at every logistical stage for all merchandise trade. The economies were the Philippines, Chinese Taipei and Thailand. But not all of them saw reductions in both trade directions for any given logistical stage. For the rest of the APEC membership, the pattern of changes in real transaction costs across the stages was broadly the same for each trade direction.

Fourteen APEC members achieved real reductions in their transaction costs in Document preparation and Customs clearance and technical control for all merchandise trade — Australia, Brunei Darussalam, Canada, Indonesia, Japan, the Republic of Korea, Malaysia, Mexico, Peru, Philippines, the Russian Federation, Chinese Taipei, Thailand and Viet Nam. The relative extent of the combined cuts realized by the member economies, however, ranged from the negligible — Japan (-0.3%) and the Russian Federation (-0.5%) — to the extraordinary in the case of Korea (-55.8%).

In absolute terms, the net savings in APEC transaction costs at these two stages over the 2006-10 period were very substantial — USD 36 billion in Document preparation and USD 13.4 billion in Customs clearance and technical control — and they dominated the overall savings picture. The savings were generally greater for imports than for exports.

Nine economies experienced cuts in aggregate transaction costs for these two logistical stages of more than 5% in real terms. They were: Australia (-6.24%); Brunei Darussalam (-15.7%); Canada (-8.4%); Indonesia (-20.4%); the Republic of Korea (-55.8%); Mexico (-31.3%); Peru (-43.6%); the Philippines (-17.9%); Thailand (-42.7%); and Viet Nam (-7.6%).

Only ten economies beat their Leaders' 5% benchmark for either or both of Ports and terminal handling and Inland transport and handling. In Inland transport and handling they were the People's Republic of China (-13.1%); Hong Kong, China (-52.0%); the Republic of Korea (-16.4%); Papua New Guinea (-33.7%); Peru (-40.1%); the Philippines (-42.8%); Thailand (-39.5%); and Viet Nam (-7.5%). In Ports and terminal handling, the only economies to do so were Indonesia (-14.5%), Papua New Guinea (-13.2%), the Philippines (-8.5%), Thailand (-26.5%), and Viet Nam (-6.6%).

Given that the most of the policy reforms that have been implemented under TFAP II and its predecessor were targeted at activities that came under Document preparation and Customs clearance and technical control, the above results suggest that TFAP II may have contributed to the reductions in transaction costs in some or all of the APEC economies in question.

4. SENSITIVITY TESTS OF CRITICAL ASSUMPTIONS

ITS Global conducted a series of sensitivity tests of the critical assumptions that it had used to estimate the trade transaction costs for APEC over the Assessment period. This Chapter briefly describes the sensitivity tests that ITS Global conducted and the results that were obtained with them.

The results of the sensitivity tests are summarised in Table 4.1. For purposes of comparison, the Table also includes the estimates that were obtained with the assumptions preferred by ITS Global for the Final Assessment. The full results of each of the sensitivity tests are set out at Annex D.

Table 4.1: Sensitivity tests of preferred estimates of APEC trade transaction costs, 2006 to 2010, 2006 trade volumes & values, 2011 prices

Sensitivity Test	2006 USD billion	2007 USD billion	2008 USD billion	2009 USD billion	2010 USD billion	Change 2006- 10 %
Preferred estimate						
Fees & charges	131	125	138	139	138	4.8
Time taken	1,055	1,029	1,011	1,001	990	-6.2
Total	1,187	1,154	1,149	1,141	1,128	-5.0
Test 1: Time taken in document preparation						
Fees & charges	133	126	139	139	138	3.7
Time taken	692	681	671	660	660	-4.6
Total	825	807	810	800	798	-3.3
Test 2: Hummels alternative valuation of time						
Fees & charges	131	125	138	139	138	4.8
Time taken	1,053	1,029	1,011	1,001	990	-6
Total	1,185	1,154	1,148	1,140	1,131	-4.5
Test 3: Lower value of transit time						
Fees & charges	131	125	138	139	138	4.8
Time taken	528	515	506	501	495	-6.2
Total	659	639	643	640	633	-4
Test 4: Higher value of transit time						
Fees & charges	131	125	138	139	138	4.8
Time taken	1,583	1,544	1,517	1,502	1,485	-6.2
Total	1,714	1,668	1,655	1,641	1,623	-5.3
Test 5: Trade volume & value weights						
Fees & charges	160	153	169	169	167	4
Time taken	1,430	1,394	1,371	1,360	1,347	-5.8
Total	1,590	1,546	1,541	1,529	1,513	-4.8

Source: World Bank Group & ITS Global estimates

A. TIME TAKEN IN DOCUMENT PREPARATION

The estimation of trade transaction costs in APEC proved to be very sensitive to the assumptions that were used to value the time taken in Document preparation. These assumptions proved to be the most sensitive of all those used for this assessment.

For the preferred estimates, the valuation of the time taken in document preparation consisted of two quite separate components.

The first component of the valuation was the internal resources used by the importing or exporting business to prepare the documents in question. This in turn assumes that all the third party resources used by the business were fully funded by the fees and charges that it paid at this logistical stage. Such an assumption is perfectly reasonable in these circumstances and the fees and charges in question ought to be captured by the World Bank's *Trading across Borders* surveys.

The internal resources consumed in document preparation were assumed to involve one employee for the duration of the time taken by document preparation. The labour time in question was valued at its opportunity cost of the output that was forgone by the employing businesses. On average, the opportunity cost of labour time in an economy is gross domestic production (GDP) per day worked by its labour force. This was the basis on which ITS Global prepared its preferred estimates.

The second component of the valuation sought to assess the implications of the document preparation process for physical production and delivery of the merchandise covered by the documentation in question. The key issues are whether a change in the time taken in document preparation delays delivery of the merchandise to the wharf-side (exports) or to the consignee's premises (imports) and, if it does to what degree.

Although they turned out to be crucial for this assessment, the answers are not generally straight-forward. Rather they depend on a detailed understanding as to the situation of the business in question finds itself at the time of the trade transaction, as well as the particulars of that transaction.

At one extreme, document preparation may not add any time to the time taken in delivering the merchandise to the wharf-side or the premises of the consignee as the case may be. At the other extreme, it may add an equivalent amount of time to the process as transit delay. (For the preferred estimates, transit delay in the logistics chain is valued in terms of the opportunity cost of the merchandise or the payment to be made in exchange for it, from the perspective of the affected business or the consumers of its product.)

For this assessment, the preferred estimates are based on an assumption that one-half of the time taken in document preparation was added to the time taken to deliver the merchandise to the consignee (for imports) or the wharf (for exports).

Sensitivity Test 1 is based on the alternative assumption that there is no transit delay as a consequence of the time taken in document preparation. This was the assumption that was used for the Interim Assessment.

In his analysis of the cost of transit delay in merchandise trade, Hummels excluded the time taken in document preparation from his estimates. He did so on the assumption that ‘... importers and exporters *may* begin work on documentation while production is underway [emphasis added]’ (Hummels 2007, p.5). As he offered no evidence either way but admitted the possibility that at least some of the time taken in document preparation could add to transit time, the exclusion of this data seems to be an unduly conservative approach to the issue.

For the Final Assessment ITS Global has changed this assumption for the preferred estimates. This was done after discussing the document preparation process in more detail with a number of logistics and customs experts in the wake of the PSU’s final report on the Interim Assessment. ITS Global now considers that transit delay is an unavoidable part of the document preparation process as it understands that process in most APEC economies.

Nevertheless the extent of the transit delay caused by a day in document preparation is clearly uncertain and Test 1 seeks to establish just how sensitive the preferred estimates are to the assumed value for the rate of any ‘pass through’.

Test 1 had the effect of lowering the estimated change in APEC trade transaction costs over the Assessment period from 5.0% to 3.3%.

Given that nearly half of the reduction in time taken across APEC economies over this period was in the Document preparation stage, the much lower unit values that were assumed as part of Test 1 were the major determinant of the substantial change in the overall result from the preferred estimate. The view that is embodied in this Test implies that the APEC Leader’s 5% goal was therefore not achieved.

As expected Test 1 substantially reduced the estimate of the annual cost of Document preparation for APEC as a whole but did not affect the transaction costs for any of the other three logistical stages, or the cost of the fees and charges that were incurred for any logistical stage. In 2010 the transaction costs in Document preparation declined from USD 471 billion to USD 141 billion a year, a cut of 70% in real terms.

B. VALUATION OF TRANSIT TIME IN MERCHANDISE TRADE

For the preferred estimates, the valuation of transit time in merchandise trade was based on the results of the empirical research conducted by Hummels (2007), which has been referred to previously.

Hummels estimated the opportunity cost of a marginal day’s delay for each of the economies covered by the *Trading across Borders* database. For each economy he calculated the premium for air shipment that domestic businesses were prepared to pay for a product to avoid an additional day of ocean transport. To arrive at an economy-wide estimate in each direction of trade, he had to aggregate the results for individual products by using one of two sets of trade weights:

- the current composition of an economy’s imports and exports; and
- the composition of the imports and exports of the region to which the economy belongs .

The second set of trade weights sought to capture the changes in composition that reductions in transit delays would generate. Hummels thought that the regional composition of trade was a proxy for the end result of the structural changes that an individual economy would experience, as a consequence of changes in the generalised cost of time to its businesses.

For the preferred estimates ITS Global used the unit time values based on an economy's own trade weights. In the absence of any further analysis of the possible extent of the changes that could be expected to occur in each case this seemed to make the most sense.

To test the implications of this assumption, ITS Global has substituted the unit time values based on the regional trade weights. This was the basis for Sensitivity Test 2 in Table 4.1.

As a general rule Test 2 imposed significantly lower unit values for time but not consistently so, either in terms of the direction or the extent of the relative change that was involved. For example, of the 42 individual unit values for time that were used in the preferred estimates, 15 of them fell, 16 did not change, and 11 rose as a consequence of this substitution.⁵

Test 2 reduced the estimated change in APEC trade transaction costs over the Assessment period to 4.5%. As the level of fees and charges were, of course, not changed in any direction, all the change was seen in the costs of time.

In addition, ITS Global tested the general level of the time valuation assumption with respect to that for fees and charges. This involved a series of very large across-the-board changes in the level. Test 3 reduced all unit time values by 50% across-the-board, while Test 4 increased those values by an equivalent amount. The range of values should more than comprehend the likely range of any errors in the specific assumptions used for the preferred estimates.

The impact of each these Tests on the estimated reduction in APEC transaction costs over the Assessment period was indeed substantial but, perhaps, not as much as might have been expected. Test 3 cut the change to -4.0%, while Test 4 raised it to -5.3%. The apparent attenuation of the impacts is due to the fact that some logistical stages had experienced significant increases in the time taken over the Assessment period. These act to partially offset the impact that any given variation in the unit value of time has on the overall decline in total transaction costs.

Of course the absolute level of each of the time cost components were increased by 50% over the level of the preferred estimates, or decreased by that amount, depending on the Test. The estimated change in aggregate time costs over the period was therefore also unchanged.

The impact of these two Tests on the total level of transaction costs was purely one of changing the share of time costs in total transaction costs. As the monetary component of APEC trade transaction costs was unchanged in absolute terms under each of these Tests, the percentage change in the APEC total varied in line with the Test but not, of course, proportionately with the change in the value of time that was assumed in each case.

⁵ 21 economies x 2 trade directions = 42 unit values

The overall impacts of the changes in assumption are best captured by the changes in the respective *ad valorem* tax equivalents that were estimated for 2010. Under Test 3 the *ad valorem* tax equivalent of APEC transaction costs averaged 5.2% over both directions of trade in 2010. Under Test 4 the *ad valorem* tax equivalent averaged 13.3% for that year. In comparison, the preferred estimates put this measure at 9.3% in that year.

C. CHOICE OF YEAR FOR TRADE VOLUME & VALUE WEIGHTS

Test 5 substituted the transaction volumes and values in 2010 for the 2006 volumes and values, which were used to calculate the preferred estimates.

For the preferred estimates the transaction costs estimates were based on constant volumes and values of trade transactions for each year of the Assessment period. The trade volumes — in this case TEU movements — were used to estimate the transaction costs due to fees and charges, while the value of merchandise trade was used to value the time taken by the merchandise in transit — in the latter case, by drawing on the Hummels estimates of the *ad valorem* values of transit time.

As a change in unit transaction costs in one year could be expected to affect the volume of trade transactions in subsequent years — which, in turn, would affect the value of merchandise that is traded, the trade volumes and values that were observed in each year cannot be used to estimate the transaction costs associated with the trade in question. Doing so would bias the estimate of the percentage change in trade transaction costs over the Assessment period.

This is known as the price index problem. It is most readily solved by using a fixed set of volumes to weight the individual prices that make up the price index or average that is being constructed. Generally, either the volumes in the first or the last year of the period under analysis are used to weight the individual components that make up the index.

Paasche indexes use the volumes in the first year for their weights, while Laspeyres indexes use those in the last year. The Laspeyres index, however, tends to overstate price rises compared to the Paasche index and to understate price declines. Unfortunately there is no *a priori* basis for generally preferring one of these approaches over the other.

ITS Global chose the 2006 weights for its preferred estimates because they were consistent with a forward-looking perspective and that such a perspective was appropriate in a public policy setting, such as the Final Assessment of TFAP II. In contrast, the 2010 weights imply a backward-looking perspective, which ITS Global feels is not appropriate when developing and implementing public policy.

The substitution of the 2010 trade volume and value weights for the 2006 ones substantially increased the absolute level of APEC transaction costs in each year of the Assessment period. For example, the 2010 weights increased the total transaction costs in APEC by just over 30% in real terms — as compared to the preferred estimate using the 2006 weights. Consequently the average *ad valorem* tax equivalent of the costs estimated with the 2010 weights rose to 12.4% for that year.

These impacts are largely the effect of the very strong underlying growth in merchandise trade values and volumes that occurred over the Assessment period – for example, container movements in TEUs rose by 24% and the real value of merchandise trade increased by 21%.

The substitution of the 2010 weights had little appreciable impact on the size of the relative change in APEC transaction costs over the Assessment period. For Test 5 the estimated reduction was 4.8%.

The higher level of container movements had the effect of raising the weight of the monetary component in total APEC transaction costs. This component was responsible for an increase in total transaction costs, other things being equal. The higher weight acts to reduce the estimated decrease in the total.

The increase in the real value of merchandise trade was not evenly spread over the individual economies of the APEC region. The compositional changes reduced the weighted average value of time at the APEC level. This also has the effect of lowering the measured decline in the time cost component, and thereby in the total.

D. SUMMARY OF SENSITIVITY TEST RESULTS

All in all, the sensitivity tests indicated that the estimated changes in APEC trade transaction costs between 2006 and 2010 were generally quite robust to even very large changes in the key assumptions that underlie the preferred estimates.

Although the changes in assumptions often had a marked effect on the absolute level of APEC trade transaction costs, their impact on the percentage change in those costs over the Assessment period was much more muted. The tests clearly indicate that the most critical assumptions are those that relate to the valuation of the time taken, particularly in Document preparation.

5. CONCLUSIONS & RECOMMENDATIONS

A. CONCLUSIONS

i. The key results

Based on its estimates of the transaction costs in APEC merchandise trade over the Assessment period, ITS Global concludes that APEC has realised the goal set by its leadership at the beginning of TFAP II — namely to reduce those costs by 5% by the end of the Plan.

The progress made by individual APEC economies towards the 5% goal, however, has been highly uneven. Many did not achieve the benchmark and others saw their transaction costs increase in real terms.

The good news is that substantial time savings were achieved across the region and there were only a few instances of regression. The importance of this is underlined by the fact that time costs heavily dominate total transaction costs.

The bad news is the fees and charges rose strongly in real terms in most APEC economies. This suggests that APEC governments may have funded the changes in public administration that were necessary to realize these time savings by outsourcing some of their under-recovering services or increasing their own fees and charges

While savings in transaction costs were achieved in most of the land-side stages of the international logistical chain, real costs rose strongly in Ports and terminal handling. This was the case pretty much consistently across the APEC region.

Our preferred estimate puts the cut in transaction costs over the Assessment period at 5.0%. At face value then, APEC's success in achieving their Leaders' goal looks very much like 'a close run thing'. Nevertheless, the extensive sensitivity testing that ITS Global has undertaken indicates that the conclusion should, on balance, be a relatively robust one.

One needs to recall, however, that these transaction cost estimates were prepared to determine how they have been affected by policy changes generally and particularly by the changes introduced under TFAP II. It was therefore necessary to neutralize the impact of the significant changes that have occurred in APEC trade over this period so as not to distort the Assessment. The estimates were therefore based on constant trade volumes and values in real terms over the Assessment period.

For this reason, the transaction cost estimates for any year do not correspond to the outcomes that can be calculated from that year's trade volumes, trade values, and general level of prices.

ii. The limitations of the data

A significant uncertainty relates to the quality of the *Trading across Borders* data panel provided by the World Bank Group to the PSU for the Assessment.

The World Bank collects the *Trading across Borders* data through an annual survey of selected experts from each country. Their responses are based on the official procedures that would be involved in a hypothetical trade transaction. The transaction is the same for both import and export.

The survey methodology used by the Bank has a number of limitations that have been acknowledged:

- The hypothetical trade transaction is based on a container of dry cargo of widely traded, non-perishable merchandise that does not involve special phytosanitary or environmental safety standards. It may therefore not be representative of an economy's merchandise trade.
- It is based on a business that is located in the economy's largest city. This may not be representative of the experience in other locations, particularly in extensive economies, such as Australia Canada, the Peoples' Republic of China, the Russian Federation, and the United States.
- It is based on the experience of a limited liability company — or its legal equivalent — of a specified size. This may not be representative of the experience of other types of business, for example, sole proprietorships or partnerships.
- The issues the survey addresses may not represent the full set of issues that a business will encounter in importing or exporting merchandise.
- The measures of time taken in completing each of the four logistical stages involve an element of judgment by the expert respondents.
- It assumes that an importer or exporter has full information on what is required and does not waste time when completing the relevant procedures. In practice, they may take longer if the business lacks information or is unable to follow up promptly.

A number of APEC economies have expressed concerns about the reliability and representativeness of the *Trading across Borders* database, as well as the opacity of the process by which the Group annually revises the historical data in the light of the latest information.

ITS Global shares these concerns, particularly about the transparency of the data revision process. Nevertheless, it also considers that the *Trading across Borders* database provides what is easily the most comprehensive and most comparable set of indicators on the transaction costs in international trade. A practical replacement is simply not in sight at this stage.

iii. The uncertainties of the valuation of time

The other area of significant uncertainty is concerned with the assumptions about the economic valuation of time in the process of getting merchandise from the exporter's premises to the wharf-side or from the wharf-side to the importer's premises.

This uncertainty is most pronounced in the preparation of the appropriate documentation by importers and exporters for presentation to government agencies. These documents are required for them to obtain the customs clearances and other regulatory approvals that are required to import or to export the merchandise in question.

It is clear that some of the work time of their employees is consumed in preparing such documents. However, it is not clear how much a day spent in document preparation adds to the timing of the delivery of the merchandise in question, either to the consignee's premises in the case of imports or to the wharf side in the case of exports.

For the Final Assessment one half of the time taken in document preparation is assumed to flow through as a transit delay in delivering the merchandise to consignee or wharf. In contrast the Interim Assessment had assumed that there would be no transit delay from the time spent in document preparation.

After reviewing the evidence, such as it is, and consulting with experts in the field, ITS Global now considers that the assumption that has been used for the Final Assessment is the more appropriate one and represents a relatively conservative approach to the estimation of trade transaction costs. Nevertheless, the sensitivity tests conducted on the estimates of trade transaction costs demonstrates that the results are highly sensitive to assumed value of time taken in document preparation.

iv. Contribution of policy changes

In and of themselves the estimates of APEC trade transaction costs do not provide any conclusive evidence of the contribution of TFAP II — or its predecessor Plan for that matter — to the reduction in those costs that was achieved over the four years of the Plan.

Such evidence could only be obtained by a detailed examination of the policy changes that were implemented by each APEC economy in the lead-up to, as well as over the period in question, the contribution of TFAP II — and its predecessor Plan — to those policy changes, and the impact of those policy changes on APEC trade transaction costs.

In other words, while the Leaders' 5% goal has been achieved, we do not know how much TFAP II contributed to the outcome.

Trade facilitation reform covers a broad and varied policy agenda and, of necessity, should be based on a sound appreciation of the effectiveness and efficiency of the full range of policy options that are available to APEC governments.

v. Importance of further early cuts in trade transaction costs

The estimated results mean the impact of trade transaction costs on the trade by APEC economies is broadly comparable to that of trade policy measures. The latter include all tariffs, tariff quotas, and non-tariff measures.

The World Bank (2011c) has developed a suite of Trade Restrictiveness Indexes (TRI) to provide comprehensive measures of the collective barrier that trade policy measures at home and abroad impose on a particular economy's imports and exports respectively.

Based on the Bank's TRI estimates in each direction of trade for each of the APEC economies, ITS Global has estimated that APEC trade policy measures are collectively the equivalent to an *ad valorem* tax of 9.0% on the value of APEC imports, and one of 9.5% on the value of APEC exports.⁶

On this basis the combined effect of trade transaction costs and trade policy measures would be the equivalent of an *ad valorem* tax of 18.9% on all APEC imports and one of 18.7% on all APEC exports. As the published research has shown consistently, such imposts represent serious impediments to international trade and, as a consequence, to domestic economic performance.

Theoretically at least, this situation should make further cuts in trade transaction costs relatively easy to achieve, other things being equal. Of course the 'other things' are rarely ever 'equal'. This is particularly the case when comparing a large industrialised economy with a small less developed one, or when comparing an economy that is relatively close to its trading partners with one that is more distant, even when they are of approximately the same size in terms of population, land area, and GDP per capita.

Nonetheless the economic case for further cuts in trade transaction costs at every logistical stage, and for them to be implemented earlier rather than later, is both clear and compelling for each and every APEC member.

B. RECOMMENDATIONS

In the light of the above conclusions, ITS Global makes the following recommendations for the consideration of the CTI.

1. APEC should continue to monitor the evolution of trade transaction costs in member economies and to use this measure to assess the progress made with APEC programmes that seek to reduce transaction costs anywhere in the logistics chain. These programmes include the Supply Chain Connectivity Initiative and any actions or measures that may be spun off from it.
2. APEC should regularly review the coverage of the actions and measures selected for the Supply Chain Connectivity Framework to ensure that the Framework is prioritising the actions and measures to be included in it in terms of their potential to reduce overall trade transaction costs. This assessment needs to take account of both types of

⁶ For this purpose each of the individual TRI values is weighted by that economy's share of APEC merchandise trade.

transaction cost as well the costs at each logistical stage, particularly in ports and terminal handling.

3. APEC should continue to use the *Trading across Borders* database to estimate trade transaction costs in member economies and at the regional level. The database represents the most comprehensive and most comparable set of indicators on the transaction costs in merchandise trade.
4. With this in mind, APEC should discuss with the World Bank Group and agree the ways and means for improving the quality and transparency of the coverage of APEC members in the *Trading across Borders* database. In this regard, a high priority should be to extend its coverage of different business locations and ports, particularly in the more internally diverse economies, such as Australia, Canada, China, Indonesia, Japan, the Philippines, and the United States.

In addition, ITS Global proposes that APEC should undertake complimentary research into:

1. The contribution of policy changes in APEC economies to the reduction in trade transaction costs, as a matter of some priority. The analysis should not be confined to the reforms that were introduced as a direct consequence of TFAP II but should address any policy change that may have had an impact on transaction costs incurred at any logistical stage, including those that were implemented before the commencement of TFAP II.
2. The economic valuation of the time taken as part of the international trading process. A first step in this regard would be to update the 2007 estimates prepared by Professor Hummels that were used for the Interim and Final Assessments. A second one would be to analyse the economic implications of time savings in document preparation to exporters and importers.

ANNEX A: METHODOLOGY & APPROACH USED TO ESTIMATE TRADE TRANSACTION COSTS

Trade transaction costs in economic terms are the resource costs – both material costs and time-related costs – involved in searching out, negotiating, monitoring and enforcing the terms of a voluntary economic exchange between a buyer and a seller. They should be distinguished from the costs of producing the good or service in question, which are sometimes referred to as ‘transformation costs’ to underline this point.

International trade incurs transaction costs at all stages of the supply chain, from negotiating a sales contract, to transporting goods locally and internationally across customs borders and through wholesale and retail logistics chains. Transaction costs are attributable either to processes undertaken by government bodies or under government jurisdiction and regulation, or they are a consequence of private sector parties operating in a regulated market. Government sector trade facilitation can reduce costs in both instances.

For the direct estimation component of the Interim Assessment, the Committee on Trade and Investment (CTI) agreed that the definition of trade transaction costs should focus on those costs that are imposed by APEC governments on international trade or at least significantly influenced by them.

This definition includes all time and monetary transaction costs. It also includes the costs incurred at every logistical stage, including the Port and terminal handling and Inland transportation and handling stages.

The definition explicitly excludes, however, the cost of all trade policy measures — such as tariffs and non-tariff barriers (NTBs) — as well as wholesale and distribution costs. There are long-established institutions for addressing the former costs, while the latter generally do not differentiate between traded and non-traded goods or those that are imported and produced domestically.

Based on this definition the Consultants have estimated the annual trade transaction costs incurred in *all* merchandise trade by each APEC economy over the Assessment period, and not just that destined for other APEC economies. The estimates were prepared in accordance with the methodology and approach that was used for the Interim Assessment of TFAP II, which was presented to the CTI in the middle of 2010. That Assessment also proposed that the same methodology and approach should be used for the Final Assessment of the Plan.

Conceptually, the process of direct estimation seeks to measure each and every transaction cost that is incurred in getting a good from the premises of the manufacturer or supplier in one economy to that of the final user in another. For APEC as a whole, this involves measuring the costs incurred in each of its economies across all of their merchandise trade transactions, both those with other APEC members and those with the rest of the world.

Reduced to its fundamentals, direct measurement of the transaction costs in any economy requires information on the resources that are necessary to conclude each transaction and the volume of such transactions. Their product gives the transaction costs for that economy.

The cost per transaction is the economic value of the expenses, effort and time that are involved in bringing the trade transaction in question to a successful conclusion. Their economic value is measured by the opportunity cost of the resources in question to their owners, rather than what they might have paid to acquire those resources in the first place, including what they might have exchanged for them in monetary terms.

A. DATA SOURCES

The keys to robust direct estimates are comprehensive and good quality data. For the direct estimation, data on unit transaction costs in international trade were provided to the PSU by the World Bank Group from its *Doing Business* databases. The rest of the data that was used was taken from public sources.

i. Data on trade transaction costs

The World Bank and the International Finance Corporation (2010) publish the *Doing Business Index* and its associated suite of annual and *ad hoc* reports. The *Doing Business Index* seeks to measure business regulation and its impact on business. It documents the degree of regulation, gauges the regulatory outcomes, and measures the burden on businesses.

For its *Doing Business Index*, the World Bank Group collects information on the regulatory impediments to trade through its *Trading across Borders* surveys.

The survey is based on a standardized, but hypothetical, transaction for both export and import. This helps to ensure the comparability of its indicators across economies and over time. The surveys are administered through local experts who administer or advise on legal and regulatory requirements. Local freight forwarders, shipping lines, customs brokers, port officials and banks provide information on the documents, cost and time required to complete each procedure.

Through its *Trading across Borders* surveys, the World Bank Group compiles the procedural requirements based on the hypothetical trade transaction. They assume that the business in question is based in the largest city of the economy in question. It does not operate within an export processing zone or an industrial estate with special export or import privileges. It is domestically owned with no foreign ownership.

The data collection is based on the business exporting a Twenty-foot Equivalent Unit (TEU) container of standardized cargo by sea transport.⁷ Every official procedure that is necessary to export the container is identified, along with the time taken in calendar days and the fees and charges in US dollars. The same is done to collect the data relating to the importation of an equivalent cargo. The costs exclude the cost of tariffs, duties and ocean transportation. The time taken and the costs excludes those incurred in the sea transport stage but they include those in the land transport one

⁷ The Trading across Borders survey does not address merchandise that is moved internationally by air cargo. While many of the official procedures that apply to such merchandise are more streamlined than those for sea cargo, for most APEC economies the proportion of their merchandise trade that is moved by air cargo is relatively small in terms of value and numbers of transactions.

The cargo to be traded is a dry-cargo. It is not hazardous, does not include any military equipment, does not require refrigeration or any other special environment, and does not involve any special phyto-sanitary or environmental safety standards, other than accepted international standards.

For the *Doing Business 2010* Report, raw data for the *Trading across Borders* component was collected from 1,455 respondents drawn from 183 economies around the world (World Bank & IFC 2009a).

In each case the World Bank Group reports the number of documents, the time taken, and the cost per container to export and to import a standardised cargo of widely traded merchandise. Each of these indicators for each direction of trade is broken down by the following logistical stages:

- Preparation of documents;
- Customs clearance and technical control;
- Ports and terminal handling; and
- Inland transportation and handling.

The hypothetical nature of the export and import transactions and the relatively small survey samples used for the collection of the raw data mean that there are question marks over the representativeness of the *Trading across Borders* data panel. In this regard, the Bank has acknowledged that:

- The raw data relate to businesses in the largest city and may not be representative of regulation in other geographical areas;
- The data relate to a limited liability company of a specified size and may not be representative of the regulation on other businesses, for example, sole proprietorships;
- The transactions that constitute the standardized scenario refer to a specific set of issues and may not represent the full set of issues a business encounters;
- The measures of time taken involve an element of judgement by the expert respondents. When sources indicate different estimates, the estimates of the time taken are the median values of the responses received; and
- The methodology assumes the business has full information on what is required and does not waste time completing the procedures in question (World Bank & IFC 2009b).

The latest version of the *Trading across Borders* data panel, which the World Bank Group provided to the PSU, covers all APEC economies for the period from 2006 to 2010 inclusive. Some of the panel data is available online from the *Doing Business* website but the disaggregation of the time series for each economy by logistical stage is only available on an unrestricted basis for the latest year of publication.

To overcome this limitation for the purpose of the Final Assessment, the Bank provided ITS Global with a fully disaggregated data panel for each of the APEC economies for the period from 2006 to 2010 inclusive. These were the data used to calculate the estimates for the Assessment.

ii. Other data used in the estimation

Transaction volumes are a function of international freight traffic, either expressed in terms of container movements or trade values, as appropriate to the method that is to be used to estimate the transaction cost component in question.

The data on the number of inwards and outwards TEU movements at container ports around the APEC region were sourced from the latest *Containerisation International Year Book* and its online database (Informa Ltd 2010). Where the coverage of the Informa database was incomplete, the gaps were filled from a range of public sources, such as individual port authorities and government agencies responsible for ports and maritime transport.

The data on the value of the merchandise exports and imports by each APEC economy were sourced from the online *Direction of Trade Statistics* database, which is maintained by the International Monetary Fund (IMF 2009a). All of these data are in US dollars.

The unit values for the time taken in international trade were taken from the results of the research by Hummels (2007). This research was based on the *Trading across Borders* database.

Hummels has estimated the unit value of time by calculating the premium that firms are willing to pay to avoid an additional day of ocean transport by using air for the international leg. The benefit from such a modal switch is the value the firm or its consumer attaches to saving a day in transit, while the costs are the higher freight charge that is involved in the use of air. Consumers, however, demand less of a good when its price is higher. The decrease in the quantity demanded when the price increases by one percent is called the price elasticity of demand.

Hummels estimated the *ad valorem* tax equivalent of a day's time saving equivalent for each traded good by combining its price elasticity of demand with the time saving in days. He aggregated the individual estimates across the traded goods sector to get an estimate for the economy as a whole, by averaging the values of time for the products in each country's trade basket. For each country he made two estimates using two sets of trade weights:

- its current (at the time) imports and exports;
- the imports and exports of the region to which the country belongs.

Hummels estimates cover each of the 175 economies that were covered by the *Doing Business* database at the time of his research. The Hummels estimates for the APEC economies are set out in Table A1.

Table A.2: Ad valorem tax equivalent of a transit day for all merchandise trade, per cent

APEC economy	Imports		Exports	
	Country weights (a)	Regional weights (b)	Country weights (a)	Regional weights (b)
Australia	1.2	0.8	1.3	1.0
Brunei Darussalam	0.8	0.8	0.9	0.9
Canada	1.0	0.8	0.9	1.0
Chile	0.9	0.9	0.6	0.8
China, PR of	0.8	0.8	0.7	0.7
Hong Kong, China	0.8	0.8	1.0	0.7
Indonesia	0.8	0.8	0.7	0.7
Japan	0.6	0.8	1.1	1.0
Korea, Republic of	0.8	0.8	1.1	1.0
Malaysia	0.8	0.8	0.6	0.7
Mexico	0.9	0.9	0.8	0.8
New Zealand	1.0	0.8	0.6	1.0
Papua New Guinea	1.0	0.9	3.0	0.8
Peru	0.6	0.8	0.5	0.7
Philippines, The	1.1	0.8	2.7	0.7
Russia	0.9	0.9	0.4	0.7
Singapore	0.8	0.8	0.8	0.7
Taipei, Chinese	0.7	0.8	0.8	0.7
Thailand	0.9	0.8	0.7	0.7
United States	0.8	0.8	0.9	1.0
Viet Nam	1.0	0.8	0.4	0.7

Notes: (a) based on the economy's imports and exports (b) based on the region's imports and exports
Source: Hummels 2007

The *World Economic Outlook* (WEO) and the database compiled for it are published biannually by the IMF. The April 2011 edition of the WEO database was the source of all the macroeconomic and demographic data on each APEC economy that were as used for the estimates (IMF 2011). This included the implicit GDP deflator index series that was used to estimate real prices — Table A.2 has the details.

Table A.2: Implicit GDP Deflator, United States, 2006 to 2011

APEC economy	2006	2007	2008	2009	2010	2011 (a)
Original series	103.257	106.296	108.619	109.615	110.662	111.874
Rebased series	0.923	0.950	0.971	0.980	0.989	1.000

Notes: (a) Estimate (b) Year 2005 = 100.0 (c) Year 2011 = 1.000
Source: IMF 2011

B. ESTIMATION PROCEDURE

The proposed method is based on the independent estimation of the monetary transaction costs and the time transaction costs of merchandise trade transactions for each APEC economy. Each of these components must be estimated separately, as they involve the application of quite different methods. The two estimates are then summed to arrive at an estimate of the total trade transaction costs for the economy in question. The individual economy results are summed, in turn, to give the result for APEC as a whole.

i. Overview of approach

Conceptually, the direct estimation process involves multiplying the unit transaction cost by the volume of trade transactions in 2006 to estimate the baseline level of transaction costs. The process is then repeated to give an estimate for each year of the Assessment period.

Formally the estimation may be expressed as follows:

$$TTC_t = \sum_{ij} [EXP_{tij} * TEU_{tij} + TIME_{tij} * VALUE_TIME_{tij} * VALUE_TRADE_{tij}]$$

where:

TTC_t is the trade transaction costs that are incurred in the economies of the APEC region in year t;

EAP_{tij} is the monetary expense per shipping container movement in year t for the i^{th} APEC member in the j^{th} direction of trade [$j = 1$ for outwards trade, and $j = 2$ for inwards trade];

TEU_{tij} is the number of shipping container movements in year t for the i^{th} APEC member in the j^{th} direction of trade;

$TIME_{tij}$ is the time taken by a shipping container between seaport and origin or destination in year t within the i^{th} APEC member in the j^{th} direction of trade;

$VALUE_TIME_{tij}$ is the opportunity cost of a day in transit for merchandise trade by the i^{th} APEC member in the j^{th} direction of trade; and

$VALUE_TRADE_{tij}$ is the value of merchandise trade in year t for the i^{th} APEC member in the j^{th} direction of trade.

Any change in unit transaction costs in one year, however, can be expected to have an inverse effect on the transaction volume in subsequent years. For this reason, using the transaction volumes that are observed in the subsequent years to estimate the change in aggregate transaction costs over the period will bias the size of the estimated change. Depending on the degree of sensitivity that exists between the volume of the type of transaction in question and a given change in its unit transaction costs, the aggregate cost can, in fact, rise or fall.

This phenomenon is known as the price index number problem. In that context the problem is solved by using either the volumes in the base year — as in a Laspeyres price index — or those in the last year — Paasche price index — as the weights when estimating the weighted average change.

This solution was used for the Assessment. The TEU movement in 2006 were used as the volume weights for the preferred estimates — the Laspeyres approach — with the 2010 volumes — the Paasche approach — as a sensitivity test. A similar approach was adopted in relation to the unit values of trade that were used to value time savings — or additional time costs — in transit.

ii. Exclusion of international freight costs

The direct estimation excluded the monetary and time costs of international sea and air freight. Its exclusion reflects two considerations — one is practical and other conceptual.

The practical consideration is the paucity of quality information on international freight costs. While shipping and airline companies are the best source, the data have to be collected on an *ad hoc* basis.

In theory, international freight costs can be estimated indirectly from official trade data. This involves comparing export (f.o.b.) and import (c.i.f.) prices for matched export and import transactions — dividing the c.i.f. value by the f.o.b. value one yields an *ad valorem* estimate of the freight cost for the transaction. While the IMF (2009a) uses UN COMTRADE data to estimate aggregate c.i.f.–f.o.b. ratios for each pair of trading partners, there are serious doubts about the robustness of their results (Anderson & van Wincoop 2004).

The conceptual issue is that the inclusion of international freight costs would distort the assessment of the contribution of APEC trade facilitation reform to the achievement of the 2010 goal. International freight rates are large compared to the other trade transaction costs (Anderson & van Wincoop 2004), are largely outside the direct influence of government, and their movement over time is dominated by changes in world oil prices.

iii. Estimation of monetary costs

To estimate the monetary transaction costs associated with an economy's exports, ITS Global multiplied its unit transaction cost for export from the *Trading across Borders* data panel by its number of outward-bound TEUs in the year in question. The exercise was then repeated for the cost of its imports, and the two summed to give the total material transaction cost for the economy in question. The individual economy results were aggregated to arrive at the APEC total.

As indicated previously, the direct estimation involved multiplying the unit transaction cost for 2006 by the volume and value of international trade transactions in that year to estimate the baseline level of transaction costs. The process was then repeated for 2007 and 2008 to give the transaction costs for each year of the Assessment period. In doing so, all prices in the direct estimation were converted to 2009 values and were multiplied by the relevant 2006 transaction volumes and values.

This approach allows the percentage change over the whole of the Interim Assessment period to be estimated and compared to the 5% goal for 2010. The estimated change over the period is equivalent to the change in a Laspeyres index of the unit transaction costs

To estimate time transaction costs, the appropriate measure of transaction volume is the real value of the trade in the relevant direction. As with the case of the monetary transaction costs, the time transaction cost estimates for the years from 2006 to 2010 inclusive were each based on the value of trade in 2006.

As far as possible the data on annual TEU movement numbers by economy were separated into outwards movements, inwards movements, and transshipments. For a small number of ports, such as Singapore, the number of transshipments over the Assessment period was a substantial proportion of the total number of TEU movements. As transshipments are not subject to the full administrative procedures that are imposed on imports, the number of transshipments was ignored in estimating the transaction volumes for the direct estimation. Where only total TEU movements were available they were divided equally between the two directions of trade.

It should be noted that we included all containers that are shipped between individual APEC economies and the rest of the world. This reflects the fact that the focus of TFAP II is to reduce trade transaction costs across the board and not just with selected trading partners. Where only total TEU movements are publicly available, the total number was split between imported and exported containers in the ratio of the value of total merchandise imports to the value of total merchandise exports for that economy for that year.

These and all other monetary values denominated in US dollars were discounted for the effects of inflation and converted to a common price basis so that they are comparable over time. This involved the use of the implicit GDP deflator for the United States published by the IMF (2011) — see Table A2. All monetary values were expressed in the price level estimated for the middle of 2011.

This method underestimates the material transaction costs in APEC as it ignores the transaction costs that are associated with both air freight and non-container sea freight. We are not aware, however, of any publicly available data on the rates of transaction costs in the relevant trades that could be used to make such adjustments to the estimates.

To estimate an economy's time transaction costs for its exports, ITS Global multiplied the value of time in international trade by its volume of exports to all destinations for the year in question. The exercise was then repeated for its imports, and the two summed to give the total time transaction costs for the economy in question. The individual economy results were then aggregated to arrive at the APEC total for the year.

iv. Estimation of time costs

For this part of the estimation process, ITS Global used the Hummels' (2007) empirical estimates of daily values for time that were based on national trade weights — Table A1 has the values that were used. (It also undertook a sensitivity test with his estimates that were based on the regional trade weights in the Table.) The Hummels' results were used to calculate the *ad valorem* tax equivalents of the total time taken by each economy's in each

trade direction in 2006 as the unit value of time for each year of the Assessment. (Again a sensitivity test was conducted subsequently on the choice of year.)

The total time taken for a country's imports was the sum of its weighted average import time and the weighted average of its export time. The import and export times were taken from the *Trading across Borders* data panel that was provided by the World Bank Group to the PSU for the Final Assessment.

A somewhat different approach is necessary to estimate the time costs in the Document preparation stage. This logistical stage involves the preparation of the documentation that an exporter or importer has to present to the relevant government agencies, such as the customs service, to obtain a customs clearance and any other regulatory approvals that might be required for the transaction to proceed to its conclusion. The time taken raises issues that do not arise in any other logistical stage.

The businesses that are responsible for presenting the documentation in question to the relevant agencies may engage a third-party to prepare the documentation on their behalf for a consideration. To the extent that this is so, the fees and charges that the business pays for such a service should be picked up in the relevant *Trading across Borders* data.

Such expenses are, however, not the only costs that the businesses in question would incur. It has to assemble and check the data that is required, then check and execute the documents itself. All of this involves labour time and such time has an opportunity cost to the business, as it is not available for producing other business outputs, such as the goods or services the business sells to earn a profit.

For this component of the time costs, ITS Global assumes that each day taken in Document preparation involves one person-day dedicated to the preparation of the paperwork required for import or export. This labour time has been valued on the basis of its opportunity cost, which is taken to be the average level of output produced (GDP) per day worked in the economy in question.

In addition, at least some part of the time taken in document preparation can be expected to delay the delivery of the merchandise in question to the premises of the consignee — in the case of imports — or to the wharf side — in the case of exports. It is not clear, however, how much of the time taken in document preparation flows through in this way to add to the overall transit time for the merchandise.

At one extreme, document preparation may not add any time to delivery. At the other extreme, it may add an equivalent amount of time to the process as transit delay — which, as we have already seen, is valued in terms of the opportunity cost of the loss of the use of the merchandise or the payment for it to the economy in question. The Terms of Reference for this report did not, however, permit the extensive research that would be required to reduce this uncertainty to any appreciable degree.

In the light of this uncertainty, ITS Global has assumed that half of the time taken in document preparation is added to the time taken to deliver the merchandise to the consignee (for imports) or the wharf (for exports). This value was selected following a reconsideration of the interaction of the document preparation and production processes within businesses

and consultation with the Centre for Customs and Excise Studies at the University of Canberra.

This represents a change to the approach adopted for the Interim Assessment. At that time ITS Global had assumed that no flow through occurred. Following a reconsideration of the issues involved, it now considers that transit delay is an unavoidable part of the document preparation process in most APEC economies. It will, however subject this change in assumption to sensitivity testing. This will include the preparation of an estimate that is based on the original assumption of no flow thorough.

v. Presentation of the results

For the Final Assessment, ITS Global estimated the total transaction costs for 2006 using the approach outlined above. This formed the base year for the Assessment of the change over the four years of the Plan. ITS Global then calculated the equivalent estimates for each year of the Plan.

Estimates were made for APEC as a whole and for each APEC economy. Each set of annual results are presented from a number of perspectives:

- the total transaction cost in US dollars;
- the *ad valorem* tax equivalent—the total transaction cost expressed as a percentage of the value of the relevant trade;
- the specific rate tax equivalent—the total transaction cost expressed in terms of US dollars per TEU movement.

The absolute result for 2010 was compared with that for 2006 to determine the size and sign of the percentage change over the Assessment period. When comparing its result for 2006 with those for later years, this estimation method has the advantage that it will ignore changes in transaction costs that are due to changes in trade volumes.

ITS Global decomposed the total transaction costs for APEC as a whole for each year of the Assessment. The breakdown is by the four logistical stages and the two types of transaction costs, which are recognized in the *Trading across Borders* database. It also disaggregated the total for each APEC economy on the same basis.

vi. Sensitivity testing

ITS Global has conducted an extensive series of sensitivity tests of each of the critical assumptions that it had used to estimate the change in trade transaction costs for APEC over the Assessment period.

Sensitivity tests were conducted on:

- the basis for the trade weights used to value a day of transit time for each economy;
- the level of the unit values used to cost transit time;
- the valuation of time taken in document preparation;
- the choice of the year for the trade volume and value weights.

ANNEX B: TRADING ACROSS BORDERS INDICATORS

Table B.1: Time taken to complete an import transaction, APEC economies 2006 to 2010

APEC economy	2006 days per TEU	2007 days per TEU	2008 days per TEU	2009 days per TEU	2010 days per TEU	Change 2006-10 %
Australia	8	8	8	8	8	0
Brunei Darussalam	19	19	19	20	20	5.3
Canada	11	11	11	11	11	0
Chile	21	21	21	21	21	0
China, PR of	24	24	24	24	24	0
Hong Kong, China	6	5	5	5	5	-16.7
Indonesia	30	27	27	27	27	-10
Japan	11	11	11	11	11	0
Korea, Republic of	12	10	8	8	7	-41.7
Malaysia	14	14	14	14	14	0
Mexico	17	17	17	12	12	-29.4
New Zealand	9	9	9	9	9	0
Papua New Guinea	29	29	29	29	29	0
Peru	29	29	25	24	17	-41.4
Philippines, The	19	19	17	17	14	-24.3
Russia	36	36	36	36	36	0
Singapore	4	4	4	4	4	0
Taipei, Chinese	12	12	12	12	12	0
Thailand	22	14	13	13	13	-40.9
United States	5	5	5	5	5	0
Viet Nam	23	23	23	21	21	-8.7
APEC average	17	17	16	16	15	-11.2

Source: World Bank Group 2011

Table B.2: Time taken to completed an export transaction, APEC economies, 2006 to 2010

APEC economy	2006 days per TEU	2007 days per TEU	2008 days per TEU	2009 days per TEU	2010 days per TEU	Change 2006-10 %
Australia	9	9	9	9	9	0
Brunei Darussalam	27	27	27	27	25	-7.4
Canada	7	7	7	7	7	0
Chile	21	21	21	21	21	0
China, PR of	21	21	21	21	21	0
Hong Kong, China	6	6	6	6	6	0
Indonesia	25	21	21	21	20	-20
Japan	10	10	10	10	10	0
Korea, Republic of	12	11	8	8	8	-33.3
Malaysia	18	18	18	18	18	0
Mexico	13	13	13	13	12	-7.7
New Zealand	10	10	10	10	10	0
Papua New Guinea	26	26	26	26	26	0
Peru	22	22	22	21	12	-45.5
Philippines, The	17	17	16	16	15	-11.8
Russia	36	36	36	36	36	0
Singapore	5	5	5	5	5	0
Taipei, Chinese	12	12	12	12	12	0
Thailand	24	17	14	14	14	-41.7
United States	6	6	6	6	6	0
Viet Nam	24	24	24	22	22	-8.3
APEC average	17	16	16	16	15	-10.3

Source: World Bank Group 2011

Table B.3: Fees & charges incurred on an import transaction, 2006 to 2010, APEC economies, 2011 prices

APEC economy	2006 USD per TEU	2007 USD per TEU	2008 USD per TEU	2009 USD per TEU	2010 USD per TEU	Change 2006-10 %
Australia	1,213	1,179	1,276	1,142	1,131	-6.8
Brunei Darussalam	639	621	729	723	716	12
Canada	1,544	1,500	1,838	1,694	1,678	8.7
Chile	742	721	819	811	804	8.3
China, PR of	466	453	561	556	551	18.3
Hong Kong, China	569	553	652	595	607	6.6
Indonesia	731	656	680	674	667	-8.8
Japan	1,135	1,102	1,078	1,069	1,072	-5.6
Korea, Republic of	1,127	784	769	757	799	-29.1
Malaysia	417	405	463	459	455	9.1
Mexico	1,908	1,853	2,111	2,092	1,901	-0.4
New Zealand	867	842	875	868	834	-3.8
Papua New Guinea	696	676	744	737	730	4.9
Peru	726	705	922	913	890	22.6
Philippines, The	867	842	844	836	738	-14.9
Russia	1,896	1,842	1,905	1,888	1,870	-1.4
Singapore	398	386	452	448	444	11.6
Taipei, Chinese	809	786	792	747	708	-12.6
Thailand	1,129	827	819	811	804	-28.8
United States	1,257	1,221	1,282	1,342	1,329	5.8
Viet Nam	635	617	624	658	652	2.7
APEC average	941.4	884.3	963.7	943.9	922.8	-2

Source: World Bank Group 2011

Table B.4: Fees & charges incurred on an export transaction, APEC economies, 2006 to 2010, 2011 prices

APEC economy	2006 USD per TEU	2007 USD per TEU	2008 USD per TEU	2009 USD per TEU	2010 USD per TEU	Change 2006-10 %
Australia	1,008	979	1,236	1,082	1,072	6.4
Brunei Darussalam	558	542	649	643	637	14.1
Canada	1,501	1,458	1,710	1,643	1,628	8.5
Chile	699	679	767	760	753	7.8
China, PR of	423	410	474	510	505	19.6
Hong Kong, China	569	553	644	638	632	11.1
Indonesia	592	702	725	719	712	20.3
Japan	1,072	1,041	1,019	1,009	1,021	-4.7
Korea, Republic of	845	784	789	757	799	-5.5
Malaysia	468	455	463	459	455	-2.8
Mexico	1,411	1,370	1,516	1,502	1,436	1.8
New Zealand	786	763	894	886	864	10
Papua New Guinea	633	615	684	678	671	6.1
Peru	623	605	886	878	869	39.6
Philippines, The	867	842	840	833	682	-21.3
Russia	1,896	1,842	1,905	1,888	1,870	-1.4
Singapore	451	438	470	465	461	2.3
Taipei, Chinese	809	786	780	735	652	-19.4
Thailand	919	647	644	638	632	-31.2
United States	1,040	1,010	1,020	1,072	1,061	2.1
Viet Nam	507	493	549	566	561	10.7
APEC average	841.6	810.2	888.7	874.4	855.9	1.7

Source: World Bank Group 201

ANNEX C: ESTIMATES OF TRADE TRANSACTION COSTS

Table C.1. APEC: Transaction costs on merchandise trade, 2006-2010, USD billion, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	17	246	263	15	234	249	20	230	251	20	222	242	19	220	239	13.2	-10.6	-9.1
Customs clearance and technical control	9	99	108	8	91	100	9	91	100	9	90	99	9	90	99	0.1	-9.6	-8.8
Ports and terminal handling cost	17	91	108	17	90	107	18	90	107	18	96	114	18	96	114	1.2	5.8	5.1
Inland transportation and handling	27	95	122	25	101	126	26	99	125	26	92	118	26	92	118	-1.5	-3.4	-3
Sub-Total	70	532	601	65	517	582	73	510	583	73	501	574	72	498	570	3	-6.3	-5.3
Exports																		
Document preparation	15	229	244	14	226	240	18	217	235	19	217	236	18	214	232	18.9	-6.5	-5
Customs clearance and technical control	7	79	86	7	78	85	8	78	86	8	77	85	8	74	82	14	-6.2	-4.5
Ports and terminal handling cost	16	100	115	16	102	118	16	102	119	17	102	119	17	103	119	6.8	2.9	3.5
Inland transportation and handling	24	117	141	22	107	129	23	103	126	23	103	126	23	102	125	-2.7	-12.4	-10.8
Sub-Total	61	524	585	59	513	572	65	501	566	67	500	567	66	492	558	6.9	-6	-4.6
All Trade																		
Document preparation	32	475	507	29	460	489	38	448	485	38	440	478	37	434	471	15.8	-8.7	-7.1
Customs clearance and technical control	16	178	194	16	169	185	17	169	186	17	168	184	17	164	181	6.3	-8.1	-6.9
Ports and terminal handling cost	33	190	223	33	192	225	34	192	226	35	199	234	34	199	233	3.8	4.3	4.2
Inland transportation and handling	50	212	262	47	208	255	49	203	252	49	195	244	49	194	244	-2.1	-8.4	-7.2
Total	131	1,055	1,187	125	1,029	1,154	138	1,011	1,149	139	1,001	1,141	138	990	1,128	4.8	-6.2	-5.0

Source: ITS Global estimates

Table C. 2. Australia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	587	5,424	6,011	570	5,424	5,994	874	5,424	6,298	708	5,424	6,132	702	5,424	6,126	19.5	0	1.9
Customs clearance and technical control	419	3,812	4,231	407	1,906	2,313	399	1,906	2,305	316	1,906	2,222	313	1,906	2,219	-25.4	-50	-47.6
Ports and terminal handling cost	978	3,812	4,790	950	3,812	4,762	930	3,812	4,742	922	3,812	4,734	913	3,812	4,725	-6.7	0	-1.4
Inland transportation and handling	1,146	1,906	3,052	1,113	3,812	4,925	1,089	3,812	4,901	1,001	3,812	4,813	991	3,812	4,803	-13.5	100	57.4
Sub-Total	3,131	14,954	18,085	3,041	14,954	17,995	3,292	14,954	18,246	2,946	14,954	17,901	2,918	14,954	17,873	-6.8	0	-1.2
Exports																		
Document preparation	82	8,467	8,549	80	8,467	8,547	778	8,467	9,246	733	8,467	9,200	726	8,467	9,193	786.4	0	7.5
Customs clearance and technical control	150	1,717	1,868	146	1,717	1,863	143	1,717	1,860	116	1,717	1,833	115	1,717	1,832	-23.7	0	-1.9
Ports and terminal handling cost	955	1,717	2,673	928	1,717	2,645	908	1,717	2,625	900	1,717	2,617	891	1,717	2,609	-6.7	0	-2.4
Inland transportation and handling	1,351	3,435	4,786	1,312	3,435	4,747	1,284	3,435	4,719	977	3,435	4,412	968	3,435	4,402	-28.4	0	-8
Sub-Total	2,538	15,337	17,875	2,465	15,337	17,802	3,113	15,337	18,450	2,725	15,337	18,062	2,699	15,337	18,036	6.4	0	0.9
All Trade																		
Document preparation	669	13,891	14,560	650	13,891	14,541	1,652	13,891	15,544	1,441	13,891	15,332	1,427	13,891	15,319	113.4	0	5.2
Customs clearance and technical control	569	5,529	6,099	553	3,623	4,177	541	3,623	4,165	432	3,623	4,055	428	3,623	4,051	-24.9	-34.5	-33.6
Ports and terminal handling cost	1,933	5,529	7,463	1,878	5,529	7,408	1,838	5,529	7,367	1,821	5,529	7,351	1,804	5,529	7,333	-6.7	0	-1.7
Inland transportation and handling	2,497	5,341	7,838	2,425	7,247	9,672	2,374	7,247	9,620	1,977	7,247	9,224	1,959	7,247	9,206	-21.6	35.7	17.5
Total	5,668	30,291	35,960	5,506	30,291	35,797	6,405	30,291	36,696	5,671	30,291	35,962	5,618	30,291	35,909	-0.9	0	-0.1

Source: ITS Global estimates

Table C.3. Brunei Darussalam: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	3	223	226	3	223	226	6	223	228	6	223	228	6	223	228	76.7	0	1.1
Customs clearance and technical control	2	17	19	2	17	19	3	17	20	3	17	20	3	17	20	49.3	0	5.4
Ports and terminal handling cost	13	17	30	13	17	30	12	17	29	12	17	29	12	34	46	-6.7	100	53.5
Inland transportation and handling	6	17	23	6	17	23	7	17	24	7	17	24	7	17	24	6.4	0	1.7
Sub-Total	25	274	298	24	274	298	28	274	302	28	274	302	28	291	318	12	6.2	6.7
Exports																		
Document preparation	3	681	684	3	681	684	8	681	688	7	681	688	7	681	688	136.4	0	0.6
Customs clearance and technical control	2	346	348	2	346	348	2	346	348	2	346	348	2	138	140	-6.7	-60	-59.7
Ports and terminal handling cost	10	138	148	10	138	148	10	138	148	9	138	148	9	208	217	-6.7	50	46.2
Inland transportation and handling	6	208	214	6	208	214	6	208	214	6	208	214	6	208	214	-6.7	0	-0.2
Sub-Total	21	1,373	1,394	21	1,373	1,394	25	1,373	1,398	25	1,373	1,398	25	1,235	1,259	14.1	-10.1	-9.7
All Trade																		
Document preparation	6	904	910	6	904	910	13	904	917	13	904	917	13	904	916	106.5	0	0.7
Customs clearance and technical control	4	363	367	4	363	367	5	363	368	5	363	368	5	155	161	21.3	-57.2	-56.3
Ports and terminal handling cost	23	155	179	22	155	178	22	155	177	22	155	177	22	242	263	-6.7	55.5	47.4
Inland transportation and handling	13	225	237	12	225	237	13	225	237	13	225	237	12	225	237	-0.2	0	0
Total	46	1,647	1,693	45	1,647	1,692	53	1,647	1,700	53	1,647	1,699	52	1,525	1,577	13	-7.4	-6.8

Source: ITS Global estimates

Table C.4. Canada: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	234	14,080	14,314	228	11,264	11,492	412	11,264	11,676	408	11,264	11,672	405	11,264	11,668	72.6	-20	-18.5
Customs clearance and technical control	176	4,171	4,347	171	4,171	4,342	167	4,171	4,338	166	4,171	4,337	164	4,171	4,335	-6.7	0	-0.3
Ports and terminal handling cost	1,172	8,343	9,514	1,138	8,343	9,481	1,448	8,343	9,791	1,435	8,343	9,778	1,421	8,343	9,764	21.3	0	2.6
Inland transportation and handling	1,758	12,514	14,272	1,707	16,685	18,393	1,949	16,685	18,635	1,656	16,685	18,341	1,640	16,685	18,325	-6.7	33.3	28.4
Sub-Total	3,339	39,108	42,448	3,244	40,463	43,707	3,977	40,463	44,440	3,665	40,463	44,128	3,630	40,463	44,093	8.7	3.5	3.9
Exports																		
Document preparation	303	7,568	7,871	196	7,568	7,764	288	7,568	7,856	428	7,568	7,996	424	7,568	7,992	40	0	1.5
Customs clearance and technical control	71	3,786	3,857	69	3,786	3,855	67	3,786	3,853	67	3,786	3,853	66	3,786	3,852	-6.7	0	-0.1
Ports and terminal handling cost	505	3,786	4,291	981	3,786	4,767	1,152	3,786	4,938	1,142	3,786	4,928	1,131	3,786	4,917	123.9	0	14.6
Inland transportation and handling	1,919	7,573	9,491	1,472	7,573	9,044	1,680	7,573	9,253	1,427	7,573	9,000	1,414	7,573	8,986	-26.3	0	-5.3
Sub-Total	2,798	22,713	25,511	2,718	22,713	25,431	3,188	22,713	25,901	3,063	22,713	25,776	3,035	22,713	25,747	8.5	0	0.9
All Trade																		
Document preparation	537	21,648	22,185	424	18,832	19,256	700	18,832	19,532	837	18,832	19,668	829	18,832	19,660	54.2	-13	-11.4
Customs clearance and technical control	246	7,958	8,204	239	7,958	8,197	234	7,958	8,192	232	7,958	8,190	230	7,958	8,188	-6.7	0	-0.2
Ports and terminal handling cost	1,677	12,129	13,806	2,119	12,129	14,248	2,600	12,129	14,729	2,577	12,129	14,706	2,552	12,129	14,681	52.2	0	6.3
Inland transportation and handling	3,677	20,087	23,763	3,179	24,258	27,437	3,630	24,258	27,888	3,083	24,258	27,341	3,054	24,258	27,312	-16.9	20.8	14.9
Total	6,137	61,821	67,958	5,962	63,176	69,138	7,164	63,176	70,341	6,728	63,176	69,904	6,664	63,176	69,841	8.6	2.2	2.8

Source: ITS Global estimates

Table C.5. Chile: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	133	3,933	4,067	130	3,933	4,063	188	3,933	4,121	487	3,933	4,420	483	3,933	4,416	261.4	0	8.6
Customs clearance and technical control	53	1,400	1,453	52	1,050	1,102	51	1,050	1,101	132	1,050	1,182	130	1,050	1,180	144.2	-25	-18.8
Ports and terminal handling cost	171	1,050	1,221	166	1,400	1,566	213	1,400	1,613	553	1,400	1,953	548	1,400	1,948	220.5	33.3	59.5
Inland transportation and handling	374	700	1,074	363	700	1,063	355	700	1,055	922	700	1,622	913	700	1,613	144.2	0	50.2
Sub-Total	732	7,083	7,814	711	7,083	7,794	807	7,083	7,890	2,093	7,083	9,176	2,073	7,083	9,156	183.4	0	17.2
Exports																		
Document preparation	90	3,709	3,799	87	3,709	3,797	135	3,709	3,845	347	3,709	4,056	344	3,709	4,053	283.2	0	6.7
Customs clearance and technical control	53	745	798	51	745	796	50	745	795	129	745	873	127	745	872	141.3	0	9.3
Ports and terminal handling cost	169	1,490	1,659	164	1,490	1,654	211	1,490	1,701	540	1,490	2,030	535	1,490	2,025	216.7	0	22.1
Inland transportation and handling	369	1,490	1,859	359	1,490	1,849	351	1,490	1,841	900	1,490	2,390	891	1,490	2,381	141.3	0	28.1
Sub-Total	681	7,434	8,115	661	7,434	8,095	747	7,434	8,182	1,915	7,434	9,349	1,897	7,434	9,331	178.7	0	15
All Trade																		
Document preparation	223	7,643	7,866	217	7,643	7,859	323	7,643	7,966	834	7,643	8,477	826	7,643	8,469	270.2	0	7.7
Customs clearance and technical control	106	2,145	2,251	103	1,795	1,898	101	1,795	1,896	260	1,795	2,055	258	1,795	2,053	142.8	-16.3	-8.8
Ports and terminal handling cost	340	2,540	2,880	330	2,890	3,220	424	2,890	3,314	1,093	2,890	3,983	1,082	2,890	3,972	218.6	13.8	37.9
Inland transportation and handling	743	2,190	2,933	722	2,190	2,912	706	2,190	2,896	1,821	2,190	4,011	1,804	2,190	3,994	142.8	0	36.2
Total	1,412	14,517	15,929	1,372	14,517	15,889	1,555	14,517	16,072	4,008	14,517	18,525	3,970	14,517	18,488	181.1	0	16.1

Source: ITS Global estimates

Table C.6. People's Republic of China: Transaction costs on merchandise trade, 2006-2010, USD billion, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	6	72	78	6	72	78	10	72	82	10	72	81	10	72	81	51.6	0	4.3
Customs clearance and technical control	3	27	30	3	27	30	3	27	30	3	27	30	3	27	30	0.5	0	0
Ports and terminal handling cost	3	14	17	3	14	17	3	14	17	3	21	24	3	21	24	-6.7	50	39.2
Inland transportation and handling	5	21	26	5	21	26	5	21	26	5	14	19	5	14	19	0.8	-33.3	-26.6
Sub-Total	17	133	151	17	133	150	21	133	154	21	133	154	21	133	154	18.3	0	2.1
Exports																		
Document preparation	6	70	77	6	70	76	8	70	78	10	70	80	9	70	80	45.8	0	3.9
Customs clearance and technical control	3	15	17	3	15	17	3	15	17	3	15	17	3	15	17	0.5	0	0.1
Ports and terminal handling cost	3	15	18	3	15	18	3	15	18	3	15	18	3	15	18	-0.9	0	-0.2
Inland transportation and handling	3	22	26	3	22	25	4	22	26	4	22	26	4	22	26	4.3	0	0.6
Sub-Total	16	122	137	15	122	137	18	122	139	19	122	141	19	122	141	19.6	0	2.3
All Trade																		
Document preparation	13	142	155	13	142	154	18	142	160	19	142	161	19	142	161	48.7	0	4.1
Customs clearance and technical control	5	42	47	5	42	47	5	42	48	5	42	47	5	42	47	0.5	0	0.1
Ports and terminal handling cost	6	28	35	6	28	35	6	28	35	6	35	42	6	35	42	-3.8	24.1	19
Inland transportation and handling	9	43	51	8	43	51	9	43	52	9	36	45	9	36	44	2.2	-16.1	-13.1
Total	33	255	288	32	255	287	39	255	294	40	255	295	39	255	294	18.9	0	2.2

Source: ITS Global estimates

Table C.7. Hong Kong, China: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	144	5,952	6,095	140	5,952	6,091	875	5,952	6,826	528	5,952	6,480	637	5,952	6,589	343.2	0	8.1
Customs clearance and technical control	288	2,901	3,189	279	2,901	3,181	273	2,901	3,175	271	2,901	3,172	268	2,901	3,170	-6.7	0	-0.6
Ports and terminal handling cost	1,905	2,901	4,806	1,851	2,901	4,752	1,811	2,901	4,712	1,795	2,901	4,696	1,778	2,901	4,679	-6.7	0	-2.7
Inland transportation and handling	1,438	5,803	7,240	1,397	2,901	4,298	1,367	2,901	4,268	1,354	2,901	4,256	1,342	2,901	4,243	-6.7	-50	-41.4
Sub-Total	3,774	17,557	21,331	3,666	14,656	18,322	4,326	14,656	18,982	3,948	14,656	18,604	4,025	14,656	18,680	6.6	-16.5	-12.4
Exports																		
Document preparation	137	3,167	3,304	133	6,335	6,468	780	6,335	7,115	451	6,335	6,786	574	6,335	6,909	319.9	100	109.1
Customs clearance and technical control	274	3,434	3,707	266	3,434	3,699	260	3,434	3,694	258	3,434	3,691	319	3,434	3,753	16.6	0	1.2
Ports and terminal handling cost	1,812	3,434	5,246	1,760	6,867	8,628	1,723	6,867	8,590	2,029	6,867	8,896	1,691	6,867	8,558	-6.7	100	63.1
Inland transportation and handling	1,368	10,301	11,669	1,328	3,434	4,762	1,300	3,434	4,734	1,288	3,434	4,722	1,404	3,434	4,837	2.6	-66.7	-58.5
Sub-Total	3,590	20,336	23,926	3,487	20,070	23,557	4,063	20,070	24,132	4,026	20,070	24,096	3,988	20,070	24,057	11.1	-1.3	0.5
All Trade																		
Document preparation	281	9,119	9,400	273	12,287	12,559	1,655	12,287	13,941	979	12,287	13,266	1,211	12,287	13,498	331.8	34.7	43.6
Customs clearance and technical control	561	6,335	6,896	545	6,335	6,880	533	6,335	6,868	529	6,335	6,864	587	6,335	6,922	4.7	0	0.4
Ports and terminal handling cost	3,717	6,335	10,052	3,611	9,769	13,380	3,534	9,769	13,302	3,824	9,769	13,592	3,468	9,769	13,237	-6.7	54.2	31.7
Inland transportation and handling	2,805	16,104	18,909	2,725	6,335	9,060	2,667	6,335	9,002	2,643	6,335	8,978	2,745	6,335	9,080	-2.1	-60.7	-52
Total	7,364	37,893	45,257	7,153	34,726	41,879	8,389	34,726	43,114	7,974	34,726	42,699	8,012	34,726	42,738	8.8	-8.4	-5.6

Source: ITS Global estimates

Table C.8. Indonesia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	646	5,523	6,169	628	5,178	5,806	614	5,178	5,792	609	5,178	5,787	603	5,178	5,781	-6.7	-6.3	-6.3
Customs clearance and technical control	431	3,705	4,136	374	2,117	2,491	366	2,117	2,483	362	2,117	2,480	359	2,117	2,476	-16.7	-42.9	-40.1
Ports and terminal handling cost	569	3,176	3,745	493	3,176	3,669	483	3,176	3,659	478	3,176	3,654	474	3,176	3,650	-16.8	0	-2.5
Inland transportation and handling	431	529	960	368	1,059	1,426	468	1,059	1,527	464	1,059	1,522	459	1,059	1,518	6.6	100	58.1
Sub-Total	2,077	12,934	15,011	1,862	11,530	13,392	1,930	11,530	13,461	1,913	11,530	13,443	1,895	11,530	13,425	-8.8	-10.9	-10.6
Exports																		
Document preparation	646	8,333	8,979	628	6,481	7,109	614	6,481	7,095	609	6,481	7,090	603	6,481	7,084	-6.7	-22.2	-21.1
Customs clearance and technical control	34	1,530	1,563	505	1,530	2,035	494	1,530	2,024	490	1,530	2,019	485	765	1,250	1333.6	-50	-20.1
Ports and terminal handling cost	569	2,294	2,864	493	1,530	2,023	483	1,530	2,012	478	1,530	2,008	474	1,530	2,003	-16.8	-33.3	-30
Inland transportation and handling	431	1,530	1,960	368	2,294	2,662	468	2,294	2,762	464	2,294	2,758	459	2,294	2,754	6.6	50	40.5
Sub-Total	1,680	13,686	15,366	1,993	11,835	13,828	2,059	11,835	13,894	2,040	11,835	13,875	2,021	11,070	13,091	20.3	-19.1	-14.8
All Trade																		
Document preparation	1,292	13,856	15,148	1,255	11,659	12,914	1,228	11,659	12,887	1,217	11,659	12,876	1,206	11,659	12,865	-6.7	-15.9	-15.1
Customs clearance and technical control	465	5,235	5,700	879	3,647	4,526	860	3,647	4,507	852	3,647	4,499	844	2,882	3,726	81.7	-44.9	-34.6
Ports and terminal handling cost	1,138	5,471	6,609	986	4,706	5,692	965	4,706	5,671	956	4,706	5,662	947	4,706	5,653	-16.8	-14	-14.5
Inland transportation and handling	861	2,059	2,920	735	3,353	4,088	936	3,353	4,289	927	3,353	4,281	919	3,353	4,272	6.6	62.9	46.3
Total	3,757	26,620	30,377	3,855	23,365	27,220	3,989	23,365	27,354	3,953	23,365	27,318	3,916	22,600	26,516	4.2	-15.1	-12.7

Source: ITS Global estimates

Table C.9. Japan: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	1,600	23,475	25,075	1,554	23,475	25,029	1,521	23,475	24,996	1,507	23,475	24,982	1,493	23,475	24,968	-6.7	0	-0.4
Customs clearance and technical control	930	10,032	10,963	901	10,032	10,934	882	10,032	10,914	874	10,032	10,906	858	10,032	10,891	-7.7	0	-0.7
Ports and terminal handling cost	1,907	10,032	11,939	1,849	10,032	11,882	1,810	10,032	11,842	1,793	10,032	11,826	1,866	10,032	11,898	-2.2	0	-0.3
Inland transportation and handling	3,941	10,032	13,973	3,831	10,032	13,863	3,749	10,032	13,781	3,715	10,032	13,747	3,694	10,032	13,727	-6.3	0	-1.8
Sub-Total	8,378	53,572	61,950	8,135	53,572	61,707	7,961	53,572	61,533	7,889	53,572	61,461	7,911	53,572	61,483	-5.6	0	-0.8
Exports																		
Document preparation	1,556	23,936	25,493	1,512	23,936	25,448	1,479	23,936	25,416	1,466	23,936	25,402	799	23,936	24,735	-48.7	0	-3
Customs clearance and technical control	452	15,426	15,878	438	15,426	15,865	429	15,426	15,855	425	15,426	15,851	1,162	15,426	16,588	157	0	4.5
Ports and terminal handling cost	1,856	15,426	17,282	1,799	15,426	17,225	1,761	15,426	17,187	1,745	15,426	17,171	1,815	15,426	17,241	-2.2	0	-0.2
Inland transportation and handling	3,834	15,426	19,260	3,727	15,426	19,153	3,647	15,426	19,073	3,614	15,426	19,040	3,558	15,426	18,984	-7.2	0	-1.4
Sub-Total	7,698	70,215	77,913	7,476	70,215	77,691	7,316	70,215	77,531	7,250	70,215	77,465	7,333	70,215	77,548	-4.7	0	-0.5
All Trade																		
Document preparation	3,156	47,411	50,567	3,066	47,411	50,477	3,000	47,411	50,412	2,973	47,411	50,384	2,291	47,411	49,703	-27.4	0	-1.7
Customs clearance and technical control	1,382	25,459	26,841	1,340	25,459	26,798	1,311	25,459	26,770	1,299	25,459	26,758	2,020	25,459	27,479	46.1	0	2.4
Ports and terminal handling cost	3,763	25,459	29,221	3,648	25,459	29,107	3,570	25,459	29,029	3,538	25,459	28,996	3,681	25,459	29,140	-2.2	0	-0.3
Inland transportation and handling	7,775	25,459	33,233	7,557	25,459	33,016	7,396	25,459	32,854	7,328	25,459	32,787	7,252	25,459	32,711	-6.7	0	-1.6
Total	16,076	123,787	139,863	15,611	123,787	139,398	15,277	123,787	139,064	15,139	123,787	138,925	15,245	123,787	139,032	-5.2	0	-0.6

Source: ITS Global estimates

Table C. 10. Republic of Korea: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	1,276	14,758	16,034	322	9,224	9,546	420	5,534	5,954	298	5,534	5,832	286	3,690	3,975	-77.6	-75	-75.2
Customs clearance and technical control	204	2,011	2,215	149	2,011	2,160	49	2,011	2,060	144	2,011	2,155	143	2,011	2,154	-30	0	-2.8
Ports and terminal handling cost	765	4,022	4,788	991	4,022	5,014	970	4,022	4,993	961	4,022	4,984	952	4,022	4,975	24.4	0	3.9
Inland transportation and handling	3,062	2,011	5,073	2,231	4,022	6,253	2,183	4,022	6,205	2,163	4,022	6,186	2,381	4,022	6,403	-22.2	100	26.2
Sub-Total	5,307	22,803	28,110	3,693	19,280	22,973	3,621	15,590	19,212	3,567	15,590	19,157	3,762	13,746	17,507	-29.1	-39.7	-37.7
Exports																		
Document preparation	n/a	13,855	13,855	317	13,855	14,172	413	5,542	5,955	293	5,542	5,835	281	5,542	5,823	n/a	-60	-58
Customs clearance and technical control	151	3,889	4,040	146	3,889	4,036	143	3,889	4,032	142	3,889	4,031	141	3,889	4,030	-6.7	0	-0.2
Ports and terminal handling cost	754	11,668	12,421	976	11,668	12,644	955	11,668	12,623	947	11,668	12,614	938	11,668	12,605	24.4	0	1.5
Inland transportation and handling	3,015	11,668	14,683	2,197	7,778	9,975	2,150	7,778	9,928	2,130	7,778	9,908	2,344	7,778	10,123	-22.2	-33.3	-31.1
Sub-Total	3,919	41,079	44,998	3,637	37,190	40,826	3,662	28,877	32,538	3,512	28,877	32,389	3,704	28,877	32,581	-5.5	-29.7	-27.6
All Trade																		
Document preparation	1,276	28,613	29,889	640	23,079	23,718	833	11,076	11,909	592	11,076	11,668	567	9,231	9,798	-55.6	-67.7	-67.2
Customs clearance and technical control	355	5,900	6,255	295	5,900	6,196	192	5,900	6,092	286	5,900	6,187	284	5,900	6,184	-20.1	0	-1.1
Ports and terminal handling cost	1,519	15,690	17,209	1,968	15,690	17,658	1,926	15,690	17,616	1,908	15,690	17,598	1,890	15,690	17,580	24.4	0	2.2
Inland transportation and handling	6,077	13,679	19,756	4,427	11,801	16,228	4,333	11,801	16,133	4,293	11,801	16,094	4,725	11,801	16,526	-22.2	-13.7	-16.3
Total	9,227	63,882	73,109	7,330	56,470	63,799	7,283	44,467	51,750	7,079	44,467	51,546	7,466	42,623	50,088	-19.1	-33.3	-31.5

Source: ITS Global estimates

Table C. 11. Malaysia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	173	7,115	7,288	168	7,115	7,283	194	7,115	7,309	192	7,115	7,307	191	7,115	7,305	10.2	0	0.2
Customs clearance and technical control	99	1,131	1,230	96	1,131	1,227	148	1,131	1,279	147	1,131	1,278	146	1,131	1,277	47.9	0	3.8
Ports and terminal handling cost	257	2,262	2,519	250	2,262	2,512	308	2,262	2,570	306	2,262	2,568	303	2,262	2,565	17.7	0	1.8
Inland transportation and handling	396	2,262	2,658	385	2,262	2,647	377	2,262	2,639	373	2,262	2,635	370	2,262	2,632	-6.7	0	-1
Sub-Total	925	12,770	13,695	899	12,770	13,668	1,028	12,770	13,798	1,019	12,770	13,788	1,009	12,770	13,779	9.1	0	0.6
Exports																		
Document preparation	290	8,238	8,528	282	7,489	7,771	196	7,489	7,684	194	7,489	7,682	192	7,489	7,681	-33.9	-9.1	-9.9
Customs clearance and technical control	97	2,089	2,186	94	3,133	3,227	150	3,133	3,283	148	2,089	2,237	147	2,089	2,236	51.2	0	2.3
Ports and terminal handling cost	259	2,089	2,348	252	2,089	2,340	311	2,089	2,399	308	3,133	3,441	305	3,133	3,438	17.7	50	46.4
Inland transportation and handling	399	3,133	3,533	388	3,133	3,521	380	3,133	3,513	376	3,133	3,509	373	3,133	3,506	-6.7	0	-0.8
Sub-Total	1,046	15,548	16,594	1,016	15,844	16,860	1,035	15,844	16,879	1,026	15,844	16,870	1,016	15,844	16,860	-2.8	1.9	1.6
All Trade																		
Document preparation	463	15,352	15,816	450	14,603	15,054	390	14,603	14,993	386	14,603	14,990	383	14,603	14,986	-17.5	-4.9	-5.2
Customs clearance and technical control	196	3,220	3,415	190	4,264	4,454	298	4,264	4,562	295	3,220	3,515	293	3,220	3,512	49.6	0	2.8
Ports and terminal handling cost	516	4,351	4,867	501	4,351	4,852	619	4,351	4,970	613	5,395	6,009	608	5,395	6,003	17.7	24	23.3
Inland transportation and handling	796	5,395	6,191	773	5,395	6,168	757	5,395	6,152	750	5,395	6,145	743	5,395	6,138	-6.7	0	-0.9
Total	1,971	28,318	30,289	1,914	28,614	30,528	2,063	28,614	30,677	2,045	28,614	30,658	2,025	28,614	30,639	2.8	1	1.2

Source: ITS Global estimates

Table C. 12. Mexico: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	276	14,035	14,310	268	15,594	15,862	366	15,594	15,959	362	7,797	8,159	275	7,797	8,072	-0.2	-44.4	-43.6
Customs clearance and technical control	299	8,240	8,538	290	5,493	5,783	609	5,493	6,102	604	5,493	6,097	478	5,493	5,971	60.2	-33.3	-30.1
Ports and terminal handling cost	220	8,240	8,460	214	8,240	8,454	366	8,240	8,605	362	8,240	8,602	359	8,240	8,598	62.7	0	1.6
Inland transportation and handling	1,462	5,493	6,955	1,421	5,493	6,914	1,157	5,493	6,651	1,147	5,493	6,640	1,136	5,493	6,629	-22.3	0	-4.7
Sub-Total	2,257	36,007	38,264	2,192	34,820	37,012	2,498	34,820	37,317	2,475	27,023	29,498	2,248	27,023	29,271	-0.4	-25	-23.5
Exports																		
Document preparation	138	8,915	9,053	134	8,915	9,049	187	8,915	9,102	309	8,915	9,224	245	7,642	7,886	77.7	-14.3	-12.9
Customs clearance and technical control	101	6,499	6,600	98	4,333	4,431	187	4,333	4,520	185	4,333	4,518	184	4,333	4,516	81.8	-33.3	-31.6
Ports and terminal handling cost	226	4,333	4,558	219	4,333	4,552	214	4,333	4,547	213	4,333	4,545	208	4,333	4,541	-7.8	0	-0.4
Inland transportation and handling	1,243	2,166	3,410	1,208	4,333	5,540	1,247	4,333	5,579	1,112	4,333	5,444	1,101	4,333	5,434	-11.4	100	59.4
Sub-Total	1,708	21,913	23,620	1,659	21,913	23,572	1,835	21,913	23,748	1,819	21,913	23,731	1,738	20,639	22,377	1.8	-5.8	-5.3
All Trade																		
Document preparation	413	22,950	23,363	401	24,509	24,911	553	24,509	25,062	671	16,712	17,383	520	15,439	15,958	25.8	-32.7	-31.7
Customs clearance and technical control	400	14,738	15,138	388	9,826	10,214	796	9,826	10,622	789	9,826	10,615	662	9,826	10,487	65.6	-33.3	-30.7
Ports and terminal handling cost	446	12,572	13,018	433	12,572	13,005	580	12,572	13,152	575	12,572	13,147	567	12,572	13,139	27.1	0	0.9
Inland transportation and handling	2,706	7,659	10,365	2,628	9,826	12,454	2,404	9,826	12,230	2,259	9,826	12,084	2,238	9,826	12,063	-17.3	28.3	16.4
Total	3,965	57,919	61,884	3,851	56,732	60,584	4,333	56,732	61,065	4,294	48,935	53,229	3,986	47,662	51,648	0.5	-17.7	-16.5

Source: ITS Global estimates

Table C. 13. New Zealand: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	134	1,619	1,753	130	1,619	1,749	170	1,619	1,789	169	1,619	1,788	146	1,619	1,765	8.9	0	0.7
Customs clearance and technical control	45	286	330	43	286	329	43	286	328	42	286	328	42	286	327	-6.7	0	-0.9
Ports and terminal handling cost	269	286	554	261	286	547	255	286	541	253	286	539	251	286	536	-6.7	0	-3.2
Inland transportation and handling	269	571	840	261	571	832	255	571	827	253	571	824	251	571	822	-6.7	0	-2.1
Sub-Total	716	2,761	3,478	696	2,761	3,457	723	2,761	3,485	717	2,761	3,478	689	2,761	3,451	-3.8	0	-0.8
Exports																		
Document preparation	72	1,340	1,413	70	1,340	1,411	200	1,340	1,540	198	1,340	1,538	184	1,340	1,525	155	0	7.9
Customs clearance and technical control	48	146	195	47	146	193	46	146	192	45	146	192	45	146	191	-6.7	0	-1.7
Ports and terminal handling cost	289	293	582	281	293	574	275	293	568	273	293	565	270	293	563	-6.7	0	-3.3
Inland transportation and handling	289	293	582	281	293	574	275	293	568	273	293	565	270	293	563	-6.7	0	-3.3
Sub-Total	699	2,072	2,771	679	2,072	2,751	796	2,072	2,868	788	2,072	2,861	769	2,072	2,841	10	0	2.5
All Trade																		
Document preparation	207	2,959	3,166	201	2,959	3,160	370	2,959	3,329	367	2,959	3,326	331	2,959	3,290	60	0	3.9
Customs clearance and technical control	93	432	525	90	432	522	88	432	520	88	432	520	87	432	519	-6.7	0	-1.2
Ports and terminal handling cost	558	578	1,136	542	578	1,120	530	578	1,109	526	578	1,104	521	578	1,099	-6.7	0	-3.3
Inland transportation and handling	558	864	1,422	542	864	1,406	530	864	1,394	526	864	1,389	521	864	1,384	-6.7	0	-2.6
Total	1,415	4,834	6,249	1,375	4,834	6,208	1,519	4,834	6,353	1,505	4,834	6,339	1,458	4,834	6,292	3	0	0.7

Source: ITS Global estimates

Table C. 14. Papua New Guinea: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	609	279	889	592	279	871	579	279	859	574	279	853	569	279	848	-6.7	0	-4.6
Customs clearance and technical control	162	113	275	155	113	267	151	113	264	150	113	263	149	113	261	-8.3	0	-4.9
Ports and terminal handling cost	648	113	761	633	113	745	619	113	732	613	113	726	608	113	720	-6.3	0	-5.4
Inland transportation and handling	375	56	431	364	56	420	569	56	625	563	56	620	558	56	614	49	0	42.6
Sub-Total	1,794	561	2,356	1,743	561	2,304	1,918	561	2,480	1,901	561	2,462	1,883	561	2,444	4.9	0	3.8
Exports																		
Document preparation	589	385	973	572	1,250	1,822	560	1,250	1,810	554	1,250	1,805	549	1,250	1,800	-6.7	225	84.9
Customs clearance and technical control	157	765	922	152	765	917	149	765	914	148	765	913	146	765	911	-6.7	0	-1.1
Ports and terminal handling cost	470	765	1,235	456	574	1,030	447	574	1,020	443	574	1,016	438	574	1,012	-6.7	-25	-18
Inland transportation and handling	362	2,678	3,039	351	1,148	1,499	549	1,148	1,697	544	1,148	1,692	539	1,148	1,687	49	-57.1	-44.5
Sub-Total	1,577	4,592	6,169	1,532	3,737	5,268	1,704	3,737	5,441	1,689	3,737	5,425	1,673	3,737	5,410	6.1	-18.6	-12.3
All Trade																		
Document preparation	1,198	664	1,862	1,164	1,530	2,694	1,139	1,530	2,669	1,128	1,530	2,658	1,118	1,530	2,648	-6.7	130.3	42.2
Customs clearance and technical control	319	878	1,196	307	878	1,185	300	878	1,178	298	878	1,175	295	878	1,172	-7.5	0	-2
Ports and terminal handling cost	1,118	878	1,996	1,089	686	1,775	1,066	686	1,752	1,056	686	1,742	1,046	686	1,732	-6.5	-21.8	-13.2
Inland transportation and handling	736	2,734	3,470	715	1,204	1,919	1,118	1,204	2,322	1,108	1,204	2,312	1,097	1,204	2,301	49	-56	-33.7
Total	3,371	5,153	8,525	3,275	4,298	7,573	3,623	4,298	7,921	3,590	4,298	7,888	3,556	4,298	7,854	5.5	-16.6	-7.9

Source: ITS Global estimates

Table C. 15. Peru: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	419	1,774	2,193	407	1,774	2,181	492	1,419	1,911	487	1,419	1,906	391	828	1,219	-6.7	-53.3	-44.4
Customs clearance and technical control	168	1,057	1,224	163	1,057	1,220	266	881	1,146	263	881	1,144	313	528	841	86.6	-50	-31.3
Ports and terminal handling cost	615	1,057	1,672	597	1,057	1,654	877	1,057	1,934	869	881	1,749	861	881	1,741	40	-16.7	4.2
Inland transportation and handling	671	352	1,023	652	352	1,004	744	352	1,096	737	352	1,089	730	352	1,082	8.9	0	5.8
Sub-Total	1,873	4,239	6,112	1,819	4,239	6,058	2,378	3,708	6,087	2,357	3,532	5,889	2,295	2,589	4,884	22.6	-38.9	-20.1
Exports																		
Document preparation	364	4,161	4,525	354	4,161	4,515	385	4,161	4,546	382	4,161	4,542	378	2,080	2,458	3.7	-50	-45.7
Customs clearance and technical control	162	3,087	3,249	157	3,087	3,244	257	3,859	4,115	254	3,859	4,113	252	1,544	1,795	55.5	-50	-44.7
Ports and terminal handling cost	351	2,315	2,666	341	2,315	2,656	847	3,087	3,934	839	2,315	3,155	831	2,315	3,147	136.9	0	18
Inland transportation and handling	675	3,859	4,534	656	3,859	4,514	719	2,315	3,034	712	2,315	3,027	705	1,544	2,249	4.5	-60	-50.4
Sub-Total	1,552	13,422	14,974	1,508	13,422	14,930	2,207	13,422	15,629	2,187	12,650	14,837	2,167	7,483	9,649	39.6	-44.2	-35.6
All Trade																		
Document preparation	784	5,935	6,718	761	5,935	6,696	877	5,580	6,456	869	5,580	6,448	769	2,908	3,677	-1.9	-51	-45.3
Customs clearance and technical control	330	4,144	4,473	320	4,144	4,464	522	4,739	5,262	518	4,739	5,257	565	2,072	2,637	71.3	-50	-41.1
Ports and terminal handling cost	966	3,372	4,338	938	3,372	4,310	1,724	4,144	5,868	1,708	3,196	4,904	1,692	3,196	4,888	75.2	-5.2	12.7
Inland transportation and handling	1,346	4,211	5,557	1,307	4,211	5,518	1,463	2,667	4,130	1,449	2,667	4,117	1,436	1,896	3,331	6.7	-55	-40
Total	3,425	17,661	21,086	3,327	17,661	20,988	4,586	17,130	21,716	4,544	16,182	20,726	4,462	10,072	14,533	30.3	-43	-31.1

Source: ITS Global estimates

Table C. 16. The Philippines: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	539	1,666	2,206	524	1,666	2,190	497	1,666	2,163	492	1,666	2,159	443	1,666	2,110	-17.8	0	-4.4
Customs clearance and technical control	523	1,340	1,863	508	1,340	1,848	497	1,005	1,502	492	1,005	1,497	483	670	1,153	-7.7	-50	-38.1
Ports and terminal handling cost	755	1,508	2,262	733	1,508	2,241	717	1,508	2,225	711	1,508	2,219	522	1,005	1,527	-30.9	-33.3	-32.5
Inland transportation and handling	419	670	1,089	407	670	1,077	465	335	800	461	335	796	456	335	791	8.9	-50	-27.3
Sub-Total	2,236	5,184	7,420	2,172	5,184	7,356	2,176	4,514	6,690	2,156	4,514	6,671	1,904	3,677	5,580	-14.9	-29.1	-24.8
Exports																		
Document preparation	521	1,340	1,861	506	1,005	1,511	485	1,508	1,993	481	1,508	1,989	378	1,340	1,718	-27.5	0	-7.7
Customs clearance and technical control	505	509	1,014	490	509	1,000	480	509	989	476	509	985	214	509	723	-57.6	0	-28.7
Ports and terminal handling cost	729	255	984	708	764	1,472	693	764	1,457	687	764	1,450	680	764	1,444	-6.7	200	46.8
Inland transportation and handling	405	1,527	1,932	393	1,527	1,921	436	509	945	432	509	941	428	509	937	5.7	-66.7	-51.5
Sub-Total	2,160	3,631	5,791	2,098	3,805	5,904	2,094	3,290	5,384	2,075	3,290	5,365	1,701	3,122	4,823	-21.3	-14	-16.7
All Trade																		
Document preparation	1,061	3,007	4,067	1,030	2,672	3,702	982	3,174	4,156	973	3,174	4,147	821	3,007	3,828	-22.6	0	-5.9
Customs clearance and technical control	1,028	1,849	2,877	998	1,849	2,847	977	1,514	2,491	968	1,514	2,482	697	1,179	1,876	-32.2	-36.2	-34.8
Ports and terminal handling cost	1,484	1,762	3,246	1,441	2,271	3,713	1,410	2,271	3,682	1,398	2,271	3,669	1,202	1,769	2,971	-19	0.4	-8.5
Inland transportation and handling	824	2,197	3,022	801	2,197	2,998	901	844	1,746	893	844	1,737	885	844	1,729	7.3	-61.6	-42.8
Total	4,396	8,816	13,212	4,270	8,990	13,260	4,271	7,804	12,075	4,232	7,804	12,036	3,604	6,799	10,403	-18	-22.9	-21.3

Source: ITS Global estimates

Table C.17. Russia: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	559	19,593	20,152	543	19,593	20,136	531	19,593	20,124	527	19,593	20,119	522	19,593	20,114	-6.7	0	-0.2
Customs clearance and technical control	1,398	5,169	6,566	1,358	5,169	6,526	1,329	5,169	6,497	1,317	5,169	6,485	1,304	5,169	6,473	-6.7	0	-1.4
Ports and terminal handling cost	699	2,584	3,283	679	2,584	3,263	664	2,584	3,249	658	2,584	3,243	652	2,584	3,236	-6.7	0	-1.4
Inland transportation and handling	2,236	6,461	8,697	2,172	6,461	8,633	2,391	6,461	8,852	2,370	6,461	8,831	2,347	6,461	8,808	5	0	1.3
Sub-Total	4,892	33,807	38,698	4,752	33,807	38,558	4,916	33,807	38,722	4,871	33,807	38,678	4,825	33,807	38,632	-1.4	0	-0.2
Exports																		
Document preparation	540	19,208	19,748	525	19,208	19,732	513	19,208	19,721	509	19,208	19,716	504	19,208	19,712	-6.7	0	-0.2
Customs clearance and technical control	1,350	3,795	5,145	1,311	3,795	5,106	1,283	3,795	5,078	1,272	3,795	5,067	1,260	3,795	5,055	-6.7	0	-1.8
Ports and terminal handling cost	675	3,795	4,470	656	3,795	4,451	642	3,795	4,437	636	3,795	4,431	630	3,795	4,425	-6.7	0	-1
Inland transportation and handling	2,160	6,325	8,485	2,098	6,325	8,423	2,310	6,325	8,635	2,289	6,325	8,614	2,267	6,325	8,592	5	0	1.3
Sub-Total	4,725	33,122	37,847	4,590	33,122	37,712	4,748	33,122	37,871	4,705	33,122	37,828	4,661	33,122	37,783	-1.4	0	-0.2
All Trade																		
Document preparation	1,099	38,800	39,899	1,068	38,800	39,868	1,045	38,800	39,845	1,035	38,800	39,836	1,025	38,800	39,826	-6.7	0	-0.2
Customs clearance and technical control	2,748	8,964	11,711	2,669	8,964	11,633	2,612	8,964	11,576	2,588	8,964	11,552	2,564	8,964	11,527	-6.7	0	-1.6
Ports and terminal handling cost	1,374	6,379	7,753	1,335	6,379	7,714	1,306	6,379	7,685	1,294	6,379	7,673	1,282	6,379	7,661	-6.7	0	-1.2
Inland transportation and handling	4,396	12,786	17,182	4,270	12,786	17,056	4,701	12,786	17,487	4,659	12,786	17,444	4,615	12,786	17,400	5	0	1.3
Total	9,616	66,929	76,545	9,342	66,929	76,271	9,664	66,929	76,593	9,576	66,929	76,505	9,486	66,929	76,415	-1.4	0	-0.2

Source: ITS Global estimates

Table C.18. Singapore: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	157	1,665	1,822	152	1,665	1,817	234	1,665	1,899	232	1,665	1,897	230	1,665	1,895	46.6	0	4
Customs clearance and technical control	87	2,070	2,156	84	2,070	2,154	82	2,070	2,152	82	2,070	2,151	81	2,070	2,151	-6.7	0	-0.3
Ports and terminal handling cost	503	2,070	2,573	489	2,070	2,559	478	2,070	2,548	474	2,070	2,544	469	2,070	2,539	-6.7	0	-1.3
Inland transportation and handling	280	2,070	2,349	272	2,070	2,341	372	2,070	2,442	369	2,070	2,438	365	2,070	2,435	30.6	0	3.6
Sub-Total	1,026	7,875	8,900	996	7,875	8,871	1,167	7,875	9,041	1,156	7,875	9,030	1,145	7,875	9,020	11.6	0	1.3
Exports																		
Document preparation	283	1,811	2,095	275	1,811	2,087	270	1,811	2,081	267	1,811	2,078	265	1,811	2,076	-6.7	0	-0.9
Customs clearance and technical control	84	2,362	2,446	81	2,362	2,444	80	2,362	2,442	79	2,362	2,441	78	2,362	2,440	-6.7	0	-0.2
Ports and terminal handling cost	486	2,362	2,848	472	2,362	2,834	462	2,362	2,824	458	2,362	2,820	453	2,362	2,816	-6.7	0	-1.1
Inland transportation and handling	270	4,725	4,995	262	4,725	4,987	359	4,725	5,084	356	4,725	5,081	353	4,725	5,077	30.6	0	1.7
Sub-Total	1,123	11,261	12,384	1,091	11,261	12,352	1,170	11,261	12,431	1,160	11,261	12,421	1,149	11,261	12,410	2.3	0	0.2
All Trade																		
Document preparation	440	3,476	3,916	427	3,476	3,904	503	3,476	3,980	499	3,476	3,975	494	3,476	3,970	12.3	0	1.4
Customs clearance and technical control	170	4,432	4,603	165	4,432	4,598	162	4,432	4,594	160	4,432	4,593	159	4,432	4,591	-6.7	0	-0.2
Ports and terminal handling cost	989	4,432	5,421	961	4,432	5,393	940	4,432	5,372	932	4,432	5,364	923	4,432	5,355	-6.7	0	-1.2
Inland transportation and handling	550	6,795	7,344	534	6,795	7,328	731	6,795	7,526	725	6,795	7,519	718	6,795	7,512	30.6	0	2.3
Total	2,149	19,135	21,284	2,088	19,135	21,223	2,337	19,135	21,472	2,316	19,135	21,451	2,294	19,135	21,429	6.7	0	0.7

Source: ITS Global estimates

Table C. 19. Chinese Taipei: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	679	9,313	9,992	660	9,313	9,973	678	9,313	9,991	671	9,313	9,984	626	9,313	9,939	-7.8	0	0
Customs clearance and technical control	271	1,537	1,808	263	1,537	1,801	258	1,537	1,795	158	1,537	1,695	209	1,537	1,746	-23	0	-0.7
Ports and terminal handling cost	506	3,075	3,581	491	3,075	3,566	481	3,075	3,556	477	3,075	3,551	469	3,075	3,544	-7.2	0	-0.7
Inland transportation and handling	632	3,075	3,706	614	3,075	3,688	627	3,075	3,702	621	3,075	3,696	522	3,075	3,596	-17.4	0	-0.1
Sub-Total	2,088	16,999	19,087	2,028	16,999	19,028	2,043	16,999	19,043	1,927	16,999	18,927	1,826	16,999	18,825	-12.6	0	-0.2
Exports																		
Document preparation	656	10,675	11,331	637	10,675	11,313	624	10,675	11,299	473	10,675	11,148	466	10,675	11,141	-29	0	-0.3
Customs clearance and technical control	262	1,942	2,204	254	1,942	2,196	249	1,942	2,191	298	1,942	2,239	202	1,942	2,143	-23	0	-0.6
Ports and terminal handling cost	489	3,883	4,372	475	3,883	4,358	465	3,883	4,348	460	3,883	4,344	453	3,883	4,337	-7.2	0	-0.6
Inland transportation and handling	610	3,883	4,494	593	3,883	4,476	606	3,883	4,489	600	3,883	4,484	504	3,883	4,387	-17.4	0	-0.1
Sub-Total	2,017	20,384	22,401	1,959	20,384	22,343	1,943	20,384	22,327	1,831	20,384	22,215	1,625	20,384	22,009	-19.4	0	-0.3
All Trade																		
Document preparation	1,335	19,988	21,324	1,297	19,988	21,285	1,301	19,988	21,290	1,144	19,988	21,133	1,092	19,988	21,080	-18.2	0	-0.2
Customs clearance and technical control	533	3,479	4,012	518	3,479	3,997	507	3,479	3,986	456	3,479	3,935	410	3,479	3,889	-23	0	-0.7
Ports and terminal handling cost	995	6,958	7,953	966	6,958	7,924	946	6,958	7,904	937	6,958	7,895	923	6,958	7,881	-7.2	0	-0.6
Inland transportation and handling	1,242	6,958	8,200	1,206	6,958	8,164	1,233	6,958	8,191	1,222	6,958	8,180	1,025	6,958	7,983	-17.4	0	-0.1
Total	4,105	37,383	41,488	3,988	37,383	41,371	3,986	37,383	41,370	3,759	37,383	41,142	3,451	37,383	40,834	-15.9	0	-0.3

Source: ITS Global estimates

Table C. 20. Thailand: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	1,834	11,144	12,978	815	6,368	7,183	797	6,368	7,165	790	6,368	7,158	782	6,368	7,151	-57.3	-42.9	-44.9
Customs clearance and technical control	140	3,821	3,960	179	2,547	2,726	199	2,547	2,746	197	2,547	2,745	196	2,547	2,743	40	-33.3	-30.7
Ports and terminal handling cost	551	3,821	4,371	543	2,547	3,090	531	2,547	3,079	527	2,547	3,074	522	2,547	3,069	-5.3	-33.3	-29.8
Inland transportation and handling	389	2,547	2,936	597	2,547	3,144	585	1,274	1,858	579	1,274	1,853	574	1,274	1,847	47.7	-50	-37.1
Sub-Total	2,913	21,333	24,245	2,134	14,009	16,144	2,112	12,736	14,848	2,093	12,736	14,829	2,073	12,736	14,809	-28.8	-40.3	-38.9
Exports																		
Document preparation	1,636	9,815	11,451	708	5,889	6,597	693	5,235	5,928	687	5,235	5,921	680	5,235	5,915	-58.4	-46.7	-48.3
Customs clearance and technical control	135	990	1,125	131	990	1,121	128	990	1,118	127	990	1,117	126	990	1,116	-6.7	0	-0.8
Ports and terminal handling cost	178	3,961	4,139	197	3,961	4,157	218	2,970	3,189	216	2,970	3,187	214	2,970	3,185	20.2	-25	-23.1
Inland transportation and handling	340	3,961	4,301	577	2,970	3,547	565	1,980	2,545	560	1,980	2,540	554	1,980	2,535	62.9	-50	-41.1
Sub-Total	2,290	18,726	21,016	1,613	13,810	15,423	1,604	11,176	12,780	1,590	11,176	12,765	1,575	11,176	12,750	-31.2	-40.3	-39.3
All Trade																		
Document preparation	3,470	20,959	24,429	1,523	12,257	13,780	1,490	11,603	13,093	1,477	11,603	13,080	1,463	11,603	13,066	-57.8	-44.6	-46.5
Customs clearance and technical control	275	4,811	5,086	310	3,537	3,848	328	3,537	3,865	325	3,537	3,862	322	3,537	3,859	17	-26.5	-24.1
Ports and terminal handling cost	729	7,781	8,510	740	6,508	7,247	750	5,518	6,267	743	5,518	6,260	736	5,518	6,253	0.9	-29.1	-26.5
Inland transportation and handling	729	6,508	7,236	1,174	5,518	6,692	1,149	3,254	4,403	1,139	3,254	4,393	1,128	3,254	4,382	54.8	-50	-39.4
Total	5,202	40,059	45,261	3,747	27,820	31,567	3,717	23,912	27,628	3,683	23,912	27,594	3,648	23,912	27,560	-29.9	-40.3	-39.1

Source: ITS Global estimates

Table C.21. United States: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	447	30,028	30,475	434	30,028	30,463	505	30,028	30,533	540	30,028	30,568	535	30,028	30,563	19.6	0	0.3
Customs clearance and technical control	140	16,635	16,775	136	16,635	16,771	226	16,635	16,861	237	16,635	16,872	235	16,635	16,870	68	0	0.6
Ports and terminal handling cost	1,118	16,635	17,753	1,086	16,635	17,722	1,116	16,635	17,751	1,106	16,635	17,741	1,095	16,635	17,731	-2	0	-0.1
Inland transportation and handling	1,537	16,635	18,173	1,493	16,635	18,129	1,461	16,635	18,097	1,580	16,635	18,215	1,565	16,635	18,200	1.8	0	0.2
Sub-Total	3,242	79,934	83,177	3,150	79,934	83,084	3,308	79,934	83,243	3,462	79,934	83,397	3,430	79,934	83,364	5.8	0	0.2
Exports																		
Document preparation	432	21,556	21,988	420	21,556	21,976	488	21,556	22,044	483	21,556	22,039	479	21,556	22,035	10.8	0	0.2
Customs clearance and technical control	135	10,113	10,248	131	10,113	10,244	128	10,113	10,241	153	10,113	10,265	151	10,113	10,264	12	0	0.2
Ports and terminal handling cost	1,080	20,226	21,306	1,049	20,226	21,275	1,027	20,226	21,252	1,017	20,226	21,243	1,008	20,226	21,233	-6.7	0	-0.3
Inland transportation and handling	945	10,113	11,058	918	10,113	11,031	898	10,113	11,011	1,017	10,113	11,130	1,008	10,113	11,121	6.6	0	0.6
Sub-Total	2,592	62,007	64,599	2,518	62,007	64,525	2,541	62,007	64,548	2,671	62,007	64,678	2,645	62,007	64,653	2.1	0	0.1
All Trade																		
Document preparation	879	51,584	52,463	854	51,584	52,438	993	51,584	52,577	1,023	51,584	52,607	1,013	51,584	52,598	15.3	0	0.3
Customs clearance and technical control	275	26,748	27,023	267	26,748	27,015	354	26,748	27,102	390	26,748	27,138	386	26,748	27,134	40.4	0	0.4
Ports and terminal handling cost	2,198	36,861	39,059	2,135	36,861	38,996	2,143	36,861	39,004	2,123	36,861	38,984	2,103	36,861	38,964	-4.3	0	-0.2
Inland transportation and handling	2,482	26,748	29,231	2,411	26,748	29,160	2,360	26,748	29,108	2,597	26,748	29,345	2,573	26,748	29,321	3.6	0	0.3
Total	5,834	141,942	147,776	5,668	141,942	147,609	5,849	141,942	147,791	6,133	141,942	148,075	6,075	141,942	148,017	4.1	0	0.2

Source: ITS Global estimates

Table C. 22. Viet Nam: Transaction costs on merchandise trade, 2006-2010, USD million, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	210	3,128	3,338	204	3,128	3,332	252	3,128	3,381	250	3,128	3,379	248	3,128	3,376	18.2	0	1.1
Customs clearance and technical control	296	2,432	2,728	288	2,432	2,720	282	2,432	2,714	250	1,945	2,196	248	1,945	2,193	-16.4	-20	-19.6
Ports and terminal handling cost	489	1,945	2,435	475	1,945	2,421	465	1,945	2,411	461	1,945	2,406	456	1,945	2,402	-6.7	0	-1.3
Inland transportation and handling	643	973	1,616	625	973	1,597	611	973	1,584	737	486	1,224	730	486	1,217	13.6	-50	-24.7
Sub-Total	1,638	8,479	10,117	1,591	8,479	10,070	1,610	8,479	10,089	1,698	7,506	9,204	1,682	7,506	9,188	2.7	-11.5	-9.2
Exports																		
Document preparation	184	1,350	1,533	178	1,246	1,424	341	1,246	1,587	318	1,246	1,564	315	1,246	1,561	71.5	-7.7	1.8
Customs clearance and technical control	270	863	1,133	262	863	1,125	257	863	1,120	254	690	945	252	690	942	-6.7	-20	-16.8
Ports and terminal handling cost	405	690	1,095	393	518	911	385	518	903	382	518	899	378	518	896	-6.7	-25	-18.2
Inland transportation and handling	405	345	750	393	690	1,084	385	690	1,075	458	518	976	453	518	971	12	50	29.5
Sub-Total	1,264	3,248	4,512	1,227	3,317	4,544	1,368	3,317	4,685	1,412	2,972	4,383	1,398	2,972	4,370	10.7	-8.5	-3.1
All Trade																		
Document preparation	393	4,478	4,871	382	4,374	4,756	594	4,374	4,968	568	4,374	4,942	563	4,374	4,937	43.1	-2.3	1.3
Customs clearance and technical control	566	3,295	3,861	550	3,295	3,845	538	3,295	3,833	504	2,636	3,140	500	2,636	3,136	-11.8	-20	-18.8
Ports and terminal handling cost	894	2,636	3,530	869	2,463	3,332	850	2,463	3,313	842	2,463	3,306	834	2,463	3,298	-6.7	-6.5	-6.6
Inland transportation and handling	1,048	1,318	2,366	1,018	1,663	2,681	996	1,663	2,659	1,195	1,004	2,199	1,184	1,004	2,188	13	-23.8	-7.5
Total	2,902	11,727	14,628	2,819	11,796	14,614	2,978	11,796	14,774	3,110	10,478	13,588	3,080	10,478	13,558	6.2	-10.7	-7.3

Source: ITS Global estimates

ANNEX D: RESULTS OF SENSITIVITY TESTS

Table D.1. Sensitivity Test 1: Time taken in document preparation, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	17	61	78	15	57	72	20	56	76	20	54	74	19	54	74	13.6	-11	-5.6
Customs clearance and technical control	9	99	108	8	91	100	9	91	100	9	90	99	9	90	99	0.2	-9.6	-8.8
Ports and terminal handling cost	18	91	109	18	90	107	18	89	108	18	96	114	18	96	114	-2.9	6	4.5
Inland transportation and handling	27	94	120	25	99	125	26	98	124	26	92	118	26	92	118	-2.2	-1.8	-1.9
Sub-Total	71	345	415	66	338	404	74	333	407	73	332	405	72	332	404	1.8	-3.6	-2.7
Exports																		
Document preparation	16	52	68	14	52	66	18	50	67	19	50	68	18	50	68	12.9	-5	-0.8
Customs clearance and technical control	6	115	122	7	110	117	8	106	114	8	74	82	8	74	82	28.5	-35.9	-32.5
Ports and terminal handling cost	16	80	97	16	77	93	17	78	95	17	110	127	17	110	126	2.9	36.6	31
Inland transportation and handling	24	100	124	22	104	126	23	103	127	23	95	118	23	95	118	-2.7	-4.9	-4.5
Sub-Total	62	348	410	60	343	403	65	337	403	67	328	395	66	328	394	5.9	-5.6	-3.8
All Trade																		
Document preparation	33	113	146	29	110	138	38	106	143	38	104	143	37	104	141	13.3	-8.2	-3.4
Customs clearance and technical control	15	215	230	16	202	217	17	197	214	17	164	180	17	164	181	12.1	-23.7	-21.4
Ports and terminal handling cost	34	171	205	34	167	201	35	167	202	35	206	241	34	206	240	-0.1	20.4	17
Inland transportation and handling	51	193	244	48	203	251	49	201	250	49	187	236	49	187	236	-2.5	-3.4	-3.2
Total	133	692	825	126	681	807	139	671	810	139	660	800	138	660	798	3.7	-4.6	-3.3

Source: ITS Global estimates

Table D.2. Sensitivity Test 2: Hummels alternative valuation of time, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	17	245	262	15	233	248	20	228	249	20	221	240	19	218	237	13.2	-11.1	-9.5
Customs clearance and technical control	9	97	106	8	90	99	9	90	99	9	89	98	9	89	97	0.1	-9.1	-8.3
Ports and terminal handling cost	17	89	106	17	88	105	18	88	106	18	95	113	18	94	112	1.2	5.9	5.1
Inland transportation and handling	27	93	119	25	98	123	26	96	122	26	89	115	26	89	115	-1.5	-4.2	-3.6
Sub-Total	70	524	594	65	509	575	73	503	575	73	494	567	72	490	562	3	-6.6	-5.5
Exports																		
Document preparation	15	238	253	14	233	247	18	225	243	19	225	244	18	223	241	18.9	-6	-4.5
Customs clearance and technical control	7	78	85	7	77	85	8	77	85	8	76	84	8	74	82	14	-4.9	-3.4
Ports and terminal handling cost	16	100	115	16	102	118	16	101	118	17	102	119	17	102	119	6.8	2.3	2.9
Inland transportation and handling	24	113	137	22	107	129	23	104	128	23	104	127	23	104	127	-2.7	-8.4	-7.4
Sub-Total	61	529	590	59	519	579	65	508	573	67	507	574	66	503	569	6.9	-4.8	-3.6
All Trade																		
Document preparation	32	483	515	29	466	495	38	454	492	38	440	485	37	434	478	15.8	-10.1	-7.1
Customs clearance and technical control	16	176	191	16	168	183	17	167	184	17	168	182	17	164	180	6.3	-6.8	-6.1
Ports and terminal handling cost	33	189	222	33	190	223	34	189	223	35	199	232	34	199	231	3.8	5.1	4
Inland transportation and handling	50	206	256	47	205	252	49	200	250	49	195	242	49	194	242	-2.1	-5.7	-5.6
Total	131	1053	1185	125	1029	1154	138	1011	1148	139	1001	1140	138	990	1131	4.8	-6	-4.5

Source: ITS Global estimates

Table D.3. Sensitivity Test 3: Lower value of transit time, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	17	123	140	15	117	132	20	115	135	20	111	131	19	110	129	13.2	-10.6	-7.7
Customs clearance and technical control	9	50	58	8	46	54	9	45	54	9	45	54	9	45	54	0.1	-9.6	-8.2
Ports and terminal handling cost	17	45	63	17	45	62	18	45	63	18	48	66	18	48	66	1.2	5.8	4.5
Inland transportation and handling	27	48	74	25	50	76	26	50	76	26	46	72	26	46	72	-1.5	-3.4	-2.7
Sub-Total	70	266	336	65	258	324	73	255	328	73	251	323	72	249	321	3	-6.3	-4.4
Exports																		
Document preparation	15	114	129	14	113	127	18	109	126	19	109	127	18	107	125	18.9	-6.5	-3.6
Customs clearance and technical control	7	39	46	7	39	46	8	39	47	8	39	46	8	37	45	14	-6.2	-3.1
Ports and terminal handling cost	16	50	65	16	51	67	16	51	68	17	51	68	17	51	68	6.8	2.9	3.9
Inland transportation and handling	24	58	82	22	53	76	23	52	75	23	51	75	23	51	74	-2.7	-12.4	-9.6
Sub-Total	61	262	323	59	256	316	65	251	315	67	250	317	66	246	312	6.9	-6	-3.5
All Trade																		
Document preparation	32	237	270	29	230	259	38	224	262	38	220	258	37	217	254	15.8	-8.7	-5.7
Customs clearance and technical control	16	89	105	16	85	100	17	85	101	17	84	100	17	82	99	6.3	-8.1	-5.9
Ports and terminal handling cost	33	95	128	33	96	129	34	96	130	35	99	134	34	99	133	3.8	4.3	4.2
Inland transportation and handling	50	106	156	47	104	151	49	101	151	49	98	147	49	97	146	-2.1	-8.4	-6.3
Total	131	528	659	125	515	639	138	506	643	139	501	640	138	495	633	4.8	-6.2	-4

Source: ITS Global estimates

Table D.4. Sensitivity Test 4: Higher value of transit time, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	17	369	387	15	353	366	20	345	366	20	334	354	19	330	349	13.2	-10.6	-9.6
Customs clearance and technical control	9	149	158	8	137	146	9	136	145	9	136	145	9	135	143	0.1	-9.6	-9.1
Ports and terminal handling cost	17	136	153	17	135	152	18	135	152	18	145	162	18	144	161	1.2	5.8	5.3
Inland transportation and handling	27	143	169	25	151	177	26	149	175	26	138	164	26	138	164	-1.5	-3.4	-3.1
Sub-Total	70	797	867	65	775	840	73	766	838	73	752	825	72	747	819	3	-6.3	-5.6
Exports																		
Document preparation	15	343	358	14	338	353	18	326	343	19	326	345	18	321	339	18.9	-6.5	-5.5
Customs clearance and technical control	7	118	125	7	116	124	8	118	125	8	116	123	8	111	119	14	-6.2	-5
Ports and terminal handling cost	16	149	165	16	154	169	16	153	170	17	154	171	17	154	170	6.8	2.9	3.3
Inland transportation and handling	24	175	199	22	160	182	23	155	178	23	154	178	23	153	176	-2.7	-12.4	-11.3
Sub-Total	61	786	847	59	769	828	65	752	817	67	750	817	66	739	804	6.9	-6	-5
All Trade																		
Document preparation	32	712	745	29	690	719	38	671	709	38	660	698	37	651	688	15.8	-8.7	-7.6
Customs clearance and technical control	16	267	283	16	254	269	17	254	271	17	251	268	17	246	262	6.3	-8.1	-7.3
Ports and terminal handling cost	33	285	318	33	288	321	34	288	322	35	298	333	34	298	332	3.8	4.3	4.3
Inland transportation and handling	50	318	368	47	312	359	49	304	353	49	293	342	49	291	341	-2.1	-8.4	-7.5
Total	131	1583	1714	125	1544	1668	138	1517	1655	139	1502	1641	138	1485	1623	4.8	-6.2	-5.3

Source: ITS Global estimates

Table D.5. Sensitivity Test 5: Trade volume & value weights, APEC Transaction costs on merchandise trade, US\$ billion, 2011 prices

Direction of Trade & Logistical Stage	2006			2007			2008			2009			2010			Change in TTCs 2006-2010 (%)		
	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total	Fees	Time	Total
Imports																		
Document preparation	22	362	384	19	347	366	26	342	368	25	334	360	25	331	356	14.8	-8.6	-7.3
Customs clearance and technical control	11	134	145	10	123	133	11	122	133	11	121	132	11	120	131	-0.8	-10.1	-9.4
Ports and terminal handling cost	20	115	135	20	114	134	21	114	134	21	125	145	20	124	144	-1.2	8	6.6
Inland transportation and handling	31	121	152	30	128	158	31	126	156	30	113	144	30	113	144	-3.4	-6.1	-5.5
Sub-Total	85	731	816	79	711	790	89	703	792	87	693	781	86	688	775	2.2	-5.9	-5
Exports																		
Document preparation	20	332	352	18	326	344	23	316	339	24	316	340	24	312	335	20.6	-6.1	-4.6
Customs clearance and technical control	9	97	106	10	96	106	10	97	107	10	95	105	10	92	102	12.1	-5.6	-4.1
Ports and terminal handling cost	19	123	142	19	126	145	20	126	146	20	126	146	20	126	146	4.5	2.4	2.6
Inland transportation and handling	28	146	175	26	134	160	28	130	158	27	129	156	27	129	156	-4.6	-12.1	-10.9
Sub-Total	76	699	774	73	683	756	80	668	748	81	667	748	80	658	738	6.1	-5.8	-4.6
All Trade																		
Document preparation	41	694	736	37	673	710	49	657	707	50	620	700	49	642	691	17.5	-7.4	-6
Customs clearance and technical control	20	231	251	20	219	239	21	219	240	21	217	237	21	212	233	5	-8.2	-7.2
Ports and terminal handling cost	39	238	277	39	240	279	41	239	280	41	251	291	40	250	290	1.5	5.1	4.6
Inland transportation and handling	60	267	327	56	262	318	59	255	314	57	243	300	57	242	299	-4	-9.4	-8.4
Total	160	1,430	1,590	153	1,394	1,546	169	1,371	1,541	169	1,360	1,529	167	1,347	1,513	4	-5.8	-4.8

Source: ITS Global estimates

REFERENCES

Informa Ltd (2011). *Containerisation International Yearbook 2011*.

International Monetary Fund. (2011). Merchandise Trade by APEC Economies. Retrieved from IMF *Direction of Trade Statistics* database.

International Monetary Fund. (2011b). *World Economic Outlook*. Retrieved from <http://www.imf.org/external/pubs/ft/weo/2011/01/index.htm>

Hummels, D. (2001), 'Towards a geography of trade costs', *Global Trade Analysis Project Working Paper*, Purdue University.

Hummels, D. (2007) *Calculating Tariff Equivalents for Time in Trade*, Report prepared for the United States Agency for International Development by Nathan Associates Inc. March 2007.

The World Bank. (2011a). Revised *Trading across Borders* data for APEC economies from 2006 to 2010 inclusive

The World Bank. (2011b). *Doing Business 2011 Report*. Retrieved from: <http://www.doingbusiness.org/~media/fpdkm/doing%20business/documents/annual-reports/english/db11-fullreport.pdf>

The World Bank. (2011c). 'Trade Restrictiveness Indices' in *World Trade indicators 2009-10* Washington, DC. Retrieved from <http://info.worldbank.org/etools/wti/3a.asp>