TRADE POLICY VERSUS INSTITUTIONAL TRADE BARRIERS: 
AN APPLICATION USING “GOOD OLD” OLS

LAURA MÁRQUEZ-RAMOS 
INMACULADA MARTÍNEZ-ZARZOSO 
CELESTINO SUÁREZ-BURGUET

FUNDACIÓN DE LAS CAJAS DE AHORROS 
DOCUMENTO DE TRABAJO 
Nº 514/2010
De conformidad con la base quinta de la convocatoria del Programa de Estímulo a la Investigación, este trabajo ha sido sometido a evaluación externa anónima de especialistas cualificados a fin de contrastar su nivel técnico.

La serie DOCUMENTOS DE TRABAJO incluye avances y resultados de investigaciones dentro de los programas de la Fundación de las Cajas de Ahorros.
Las opiniones son responsabilidad de los autores.
TRADE POLICY VERSUS INSTITUTIONAL TRADE BARRIERS: AN APPLICATION USING “GOOD OLD” OLS

Laura Márquez-Ramos*
Inmaculada Martínez-Zarzoso*
Celestino Suárez-Burguet*

Abstract

Trade policy barriers are only one element of overall trade costs. Due to the decrease in the influence of tariff barriers on trade over time, institutional barriers are increasing in relative importance. This paper quantifies and compares the impact that a number of institutional and policy trade barriers have on bilateral trade flows. A theoretically justified gravity model of trade is estimated by using Baier and Bergstrand (2009) proposed methodology for a cross-section of countries in 2000. Results indicate that institutional trade barriers have a greater impact on trade flows than tariff barriers. According to these findings, trade policy negotiation efforts should focus on facilitating trade processes and should be at the forefront of multilateral negotiations.

Keywords: Tariff barriers, trade facilitation, sectoral trade.

JEL classification: F14.

Corresponding Author: Laura Márquez-Ramos, Department of Economics and Institute of International Economics, Universitat Jaume I, Campus del Riu Sec, 12071 Castellón, Spain. E-mail: lmarquez@eco.uji.es

*Department of Economics and Institute of International Economics, Universitat Jaume I.
1. Introduction

In the last decades, trends towards geographical regionalisation and globalisation have led to a decrease in the influence of tariff barriers on trade. Indeed, in 1987, the overall annual average applied tariff rate (expressed in non-weighted terms) was of 25%, whereas in 2007 this figure was only 9%. As a consequence, other trade costs components such as transport costs and technological innovation have gained importance as determinants of trade patterns worldwide. Indeed, a broader concept named “trade facilitation” is of growing interest in the trade policy debate and has been explicitly included in the Doha Development Agenda.

Whereas the role of tariffs in trade has a long tradition (see e.g. Kreinin, 1961; Harrigan, 1993), as well as the role of technological innovation (see e.g. Vernon, 1970; Soete, 1987; Freund and Weinhold, 2004; Fink et al., 2005). It has been only recently that a number of studies have examined the importance of trade facilitation (Wilson et al., 2005; Djankov, Freund and Pham, 2006; Martínez-Zarzoso and Márquez-Ramos, 2008). In earlier studies, the usual approach was to focus on only one of the abovementioned trade determinants, instead of considering simultaneously the effect of the different components of trade costs. More recently, a few studies have considered in a single investigation different components of trade costs. Examples are Baier and Bergstrand (2001) who explained the growth of world trade with transport costs, tariffs and income variables and van Wincoop (2004) who specifically studied the different components of trade cost and their trade effects and presented an extensive review of the empirical literature.

From a methodological point of view, a growing number of studies use the gravity model of trade as a general framework to estimate the determinants of bilateral trade flows. However, only the most recent research solves some of the estimation problems related to the correct specification of the so-called multilateral resistance terms. Anderson and van Wincoop (2003) show that it is not just bilateral trade costs, but those costs relative to multilateral trade cost that are relevant for predicting bilateral trade. Omitting controls for the so-called multilateral resistance can lead to biased coefficient estimates. More importantly, it can lead to grossly misleading comparative static estimates of the impact of trade barriers on trade.

This paper aims to contribute to the existent literature in three fronts. First, it aims to quantify and compare the effect of tariff barriers, technological innovation and trade facilitation measures on international trade flows at sectoral level. We consider the role of tariffs, internal transport cost, time required to cross borders and number of documents required for trade, together with information technology, as influential factors in disaggregated trade flows. Secondly, it uses a new methodology, recently developed by Baier and Bergstrand (2009) suitable to construct multilateral resistance terms for all bilateral variables and include importer-equivalents for all

---

1 Trade policy can still be a key issue in some countries. For example, tariff peaks and tariff escalation remain important issues for developing countries.
2 See Figure A.1 in the Appendix.
country-specific variables. The advantage of this method over the traditional log-linear OLS approach is that it is based on a theoretically grounded gravity model. Finally, as there are clear economic differences between developed and developing countries leading to disparities in the impact that the determinants of bilateral trade flows have on trade, the model will be estimated separately for each exporter.

The main results can be summarised as follows. Firstly, a reduction in the number of days and the number of documents needed for trade promotes international trade to a greater extent than equivalent reductions in tariff barriers. Secondly, the former effect is comparable to the effect of distance on trade. Finally, information technology also plays an important role in promoting trade.

The paper is organised as follows. Literature review about trade facilitation and methodology used in the present paper is outlined in Section 2. In Section 3, the data, sources and variables used are presented, together with a detailed description of how the trade facilitation and tariff data were gathered. Section 4 presents the model specification, the main results and a number of robustness tests. Simulations and policy implications are presented in Section 5. Finally, Section 6 offers some concluding remarks.

2. Literature Review

In this section we mainly review the recent literature related to trade facilitation in a very broad sense, including information technology as one of the factors that facilitate trade. But, since we also consider the effect of tariffs, we consider appropriate to briefly refer to the literature on the effects of trade policy barriers on imports. Harrigan (1993) is probably the paper most related to our investigation. The author develops a monopolistic competition model to evaluate the effect of trade barriers on OECD imports. In his model, transport costs are also included as a determinant of trade and trade policy barriers are divided into tariffs and non-tariff barriers (NTBs). In his empirical evaluation of the theoretical model, estimated for a cross-section of 13 OECD countries and 28 product categories using data for 1983, he concludes that estimated transport costs and average tariffs had large negative effects on imports, although the level of tariffs was generally low. In contrast, NTBs had a small or imperceptible effect on gross imports.

Moving now to trade facilitation, the issue is clearly gaining interest in the trade policy debate, as shown by its inclusion in the Doha Development Agenda. However, the measurement and quantification of the potential benefits of trade facilitation have only recently been investigated and the approaches used are far from uniform in terms of the definition of trade facilitation and the empirical approach used.

In relation to the definition of trade facilitation, Wilson, Mann and Otsuki (2003, 2005) considered a broad definition of trade facilitation, and quantified the impact of four different measures (port efficiency, customs environment, regulatory environment and e-business usage). As an alternative, Engman (2005) used the WTO definition of trade facilitation (the simplification and
harmonisation of international trade procedures) by paying attention only to what happens around the border. Other authors focused, instead, on the effects of single measures of trade facilitation (information technology, port efficiency, institutions’ quality).

Two main modelling approaches have been used. On the one hand, several investigations use the gravity model of trade augmented with “trade facilitation” variables. In this line, Wilson, Mann and Otsuki (2003, 2005) estimated a gravity model of trade augmented with the above-mentioned trade-facilitation variables for a group of countries in the Asia-Pacific region and for a sample of 75 countries. In addition, Soloaga, Wilson and Mejía (2006) used a similar methodology and data, but focused on Mexican competitiveness. In a more general setting, Djankov, Freund and Pham (2006) used the World Bank’s Doing Business Database, as we do in this paper, but focused only on the effects of time delays in the exporting country whereas Nordas, Pinali and Grosso (2006) centred on how time delays affect the probability to export and the export volumes for imports from Japan, Australia and the United Kingdom. Persson (2007) studied the effect of time delays and transaction costs on trade flows using a sample selection approach and focussing on the specific effects for each of the six groups of ACP countries negotiating Economic Partnership agreements with the EU. Finally, Martínez-Zarzoso and Márquez-Ramos (2008) analyse the effect of trade facilitation on trade volumes at a disaggregated level. They focus on the simplification of “at the border procedures”, which include the number of documents and amount of time involved in border crossings, as well as the transaction cost incurred. Their results support multilateral initiatives that encourage countries to assess and improve their trade facilitation needs and priorities.4

On the other hand, several institutions and authors (UNCTAD, 2001; OECD, 2003; Dennis, 2006; Decreux and Fontagne, 2006) used a computable general equilibrium model to estimate the effect of a composite index of trade facilitation on trade flows.

Although several data sets and estimation methods have been utilised within the context of these two approaches, the results reveal significant and positive effects on trade flows in most cases. This paper mainly differs from existing literature in that it compares the effectiveness of several trade facilitation measures with the effectiveness of trade liberalisation, in the inclusion of three different measures of trade facilitation for exporter and importer countries and in the improvement of the methodological approach.

3. Data, sources and variables

Bilateral trade data by commodity were obtained from Feenstra et al. (2005). The level of disaggregation chosen was the 4-digit SITC. The sample of countries comprised 13 exporters

---

3 See Wilson, Mann and Otsuki (2003, 2005) for a more detailed review of earlier work on single measures of trade facilitation.

4 Arruñada (2007) states that the priority should not only be to simplify the procedures, but also, to restructure formalities and enhance the value of institutions to generate reliable information, which is essential for reducing transaction costs.
and 167 importers in the year 2000 (Table A.1, Appendix). The 13 exporters were chosen to have a representative sample of the world economy in accordance to the classification matrix constructed in Martínez-Zarzoso and Márquez-Ramos (2008). The sectors analysed include 146 sectors with homogeneous goods, 349 sectors with reference-priced goods, and 694 sectors with differentiated goods.

The databases used to construct the explanatory variables for the regression analysis are the World Development Indicators (2005) for income and the Doing Business (2006) database for trade facilitation variables. This database was recently created by the World Bank and it compiles procedural requirements for exporting and importing a standardised cargo of goods. Data are for 2004. Distance between capitals is taken from CEPII. Technological innovation is proxied using the Technological Achievement Index (TAI) computed by UNDP (2001), which is only available for 2000. This indicator takes into account a broad array of variables related to technological innovation.

Tariff data come from the Trade Analysis Information System (TRAiNS) and were extracted using WITS (World Integrated Trade Solution). Tariffs faced by each of the 13 exporting countries were collected by using the importing countries as reporting countries. We obtained tariffs weighted by their corresponding trade values at one digit SITC level in the year 2000. TRAiNS presents three types of tariff for each product: bound rate, preferential and Most-Favoured Nation tariffs (MFN). Bound tariffs are specific commitments made by individual WTO members. The bound rate is the maximum MFN tariff level for a given product line. When WTO members negotiate tariff levels, they agree the bound tariff rates, but these are not necessarily the same rates that a WTO member applies to other WTO members' products. The preferential rate is the lowest one. Under a preferential trade agreement, one country imposes lower tariffs on another country's products than their MFN rate. Exporting countries may therefore have access to several different preference programmes from a given importing partner and for a given product. MFN tariffs are the rate countries promise to impose on imports from other members of the World Trade Organisation, unless the country is part of a preferential trade agreement.

WITS uses the concept of effectively applied tariffs, defined as the lowest tariff granted by an importer to an exporter for a particular product. The rates used in this paper are the weighted average effectively applied tariffs for each country importing each product from the 13 exporters in the sample. Table 1 shows weighted average tariffs imposed on imports from the 13-country

---

5 The dist_cepii file was taken from [http://www.cepii.fr/anglaisgraph/bdd/distances.htm](http://www.cepii.fr/anglaisgraph/bdd/distances.htm). Simple distances are calculated following the great circle formula, which uses the latitudes and longitudes of the most important cities/agglomerations (in terms of population).

6 Countries can break a commitment (i.e., raise a tariff above the bound rate), but only with difficulty. To do so they have to negotiate with the countries most closely concerned and that could result in compensation for trading partners’ loss of trade.

7 UNCTAD and the World Bank have computed ad valorem equivalents (AVEs) of non ad valorem tariffs, which are included when average tariff rates are computed. A three-step method for estimating unit values is used: (1) from tariff line import statistics of the market country available in TRAiNS; then (if (1) is not available) (2) from the HS 6-digit import statistics of the market country from COMTRADE; then (if (1) and (2) are not available) (3) from the HS 6-digit import statistics of all OECD countries. Once a unit value is estimated, then it is used for all types of rates (MFN, preferential...).
sample to all importing countries in the year 2000 for the different sections of the Standard International Trade Classification (SITC, revision 2). Overall, protection is greater on sensitive products such as food and live animals, beverages and tobacco and animal and vegetable oils, fats and waxes.

Trade facilitation variables are from the Doing Business Dataset. It compiles the procedural requirements for exporting and importing a standardised cargo of goods. Every official procedure for exporting and importing the goods is recorded (from the contractual agreement between the two parties to the delivery of goods) along with the time and cost necessary for completion. All documents required for the clearance of the goods across the border are also recorded. For exporting goods, procedures range from packing the goods at the factory to their departure from the port of origin. For importing goods, procedures range from the vessel's arrival at the port of entry to the delivery of the cargo to the factory warehouse. Local freight forwarders, shipping lines, customs brokers and port officials provide information on required documents and costs, as well as the time for completing each procedure. To make the data comparable across countries, several assumptions about the business and the traded goods are made. The main assumptions refer to the business and types of goods traded. The business has to be located in the country’s most populous city, and it must have 200 employees or more. It is assumed to be a private, limited liability company that does not operate within an export processing zone, or an industrial estate with special export or import privileges. The business must be domestically owned with no foreign ownership and must export more than 10% of its sales.

The traded product must travel in a dry-cargo, 20-foot, full container load, not be hazardous, and not include military items. In addition, it must not require special conditions for transport, like refrigeration, and must not require any special plant health or environmental safety standards other than accepted international standards. Finally, the product falls under the following Standard International Trade Classification (SITC) Revision categories: SITC 65 (textile yarn, fabrics and made-up articles); SITC 84 (articles of apparel and clothing accessories) or SITC 07 (coffee, tea, cocoa, spices and manufactures thereof).

The inland transport cost is recorded as the fees levied on a 20-foot container in US dollars. All the fees associated with completing the procedures to export or import goods are included. These, in turn, include costs of documents, administrative fees for customs clearance and technical control, terminal handling charges and inland transport. The cost measurement does not include tariffs or trade taxes. Only official costs are recorded.

The first half of Table 2 shows summary statistics of the variables used in the empirical application and the second half shows the simple correlations among the variables used.
Table 1. Average effectively applied tariffs (expressed in weighted terms) imposed on imports from the 13-country sample by all countries in the year 2000.

<table>
<thead>
<tr>
<th>Product</th>
<th>Product Name</th>
<th>South Africa</th>
<th>Australia</th>
<th>Bolivia</th>
<th>Brazil</th>
<th>Chile</th>
<th>China</th>
<th>Czech Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Food and live animals</td>
<td>9.92</td>
<td>18.41</td>
<td>12.92</td>
<td>9.30</td>
<td>7.20</td>
<td>7.33</td>
<td>17.61</td>
</tr>
<tr>
<td>1</td>
<td>Beverages and tobacco</td>
<td>12.90</td>
<td>6.93</td>
<td>15.23</td>
<td>25.30</td>
<td>7.21</td>
<td>5.04</td>
<td>34.26</td>
</tr>
<tr>
<td>2</td>
<td>Raw materials, inedible, except fuels</td>
<td>1.68</td>
<td>3.11</td>
<td>4.28</td>
<td>5.85</td>
<td>1.15</td>
<td>2.32</td>
<td>1.99</td>
</tr>
<tr>
<td>3</td>
<td>Mineral fuels, lubricants and related materials</td>
<td>3.38</td>
<td>1.47</td>
<td>0.66</td>
<td>1.56</td>
<td>6.61</td>
<td>2.61</td>
<td>1.40</td>
</tr>
<tr>
<td>4</td>
<td>Animal and vegetable oils, fats and waxes</td>
<td>10.42</td>
<td>11.27</td>
<td>19.54</td>
<td>17.19</td>
<td>9.66</td>
<td>1.97</td>
<td>17.06</td>
</tr>
<tr>
<td>5</td>
<td>Chemicals and related products, n.e.s.</td>
<td>6.04</td>
<td>3.56</td>
<td>7.07</td>
<td>3.69</td>
<td>5.95</td>
<td>4.68</td>
<td>4.36</td>
</tr>
<tr>
<td>6</td>
<td>Manufactured goods classified chiefly by material</td>
<td>2.17</td>
<td>3.11</td>
<td>3.49</td>
<td>3.54</td>
<td>3.55</td>
<td>4.77</td>
<td>5.79</td>
</tr>
<tr>
<td>7</td>
<td>Machinery and transport equipment</td>
<td>6.65</td>
<td>3.99</td>
<td>2.67</td>
<td>4.57</td>
<td>13.66</td>
<td>2.58</td>
<td>6.33</td>
</tr>
<tr>
<td>8</td>
<td>Miscellaneous manufactured articles</td>
<td>4.68</td>
<td>5.32</td>
<td>6.12</td>
<td>5.82</td>
<td>7.78</td>
<td>4.64</td>
<td>4.83</td>
</tr>
<tr>
<td>9</td>
<td>Commodities and transactions, n.e.s.</td>
<td>14.72</td>
<td>1.54</td>
<td>0.00</td>
<td>2.86</td>
<td>0.68</td>
<td>7.30</td>
<td>10.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Product Name</th>
<th>Germany</th>
<th>Ghana</th>
<th>Japan</th>
<th>Spain</th>
<th>United Kingdom</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Food and live animals</td>
<td>14.16</td>
<td>1.65</td>
<td>10.46</td>
<td>12.19</td>
<td>13.75</td>
<td>18.70</td>
</tr>
<tr>
<td>1</td>
<td>Beverages and tobacco</td>
<td>16.25</td>
<td>7.45</td>
<td>21.31</td>
<td>14.70</td>
<td>23.83</td>
<td>30.22</td>
</tr>
<tr>
<td>2</td>
<td>Raw materials, inedible, except fuels</td>
<td>4.17</td>
<td>1.53</td>
<td>4.76</td>
<td>5.25</td>
<td>6.15</td>
<td>6.75</td>
</tr>
<tr>
<td>3</td>
<td>Mineral fuels, lubricants and related materials</td>
<td>2.67</td>
<td>2.80</td>
<td>7.36</td>
<td>14.50</td>
<td>1.33</td>
<td>5.13</td>
</tr>
<tr>
<td>4</td>
<td>Animal and vegetable oils, fats and waxes</td>
<td>13.53</td>
<td>0.75</td>
<td>6.73</td>
<td>8.72</td>
<td>10.83</td>
<td>12.38</td>
</tr>
<tr>
<td>5</td>
<td>Chemicals and related products, n.e.s.</td>
<td>4.28</td>
<td>6.43</td>
<td>5.70</td>
<td>7.35</td>
<td>4.15</td>
<td>4.55</td>
</tr>
<tr>
<td>6</td>
<td>Manufactured goods classified chiefly by material</td>
<td>5.52</td>
<td>1.45</td>
<td>8.32</td>
<td>11.43</td>
<td>8.35</td>
<td>7.49</td>
</tr>
<tr>
<td>7</td>
<td>Machinery and transport equipment</td>
<td>5.54</td>
<td>1.92</td>
<td>5.27</td>
<td>8.23</td>
<td>3.71</td>
<td>4.07</td>
</tr>
<tr>
<td>8</td>
<td>Miscellaneous manufactured articles</td>
<td>4.07</td>
<td>3.56</td>
<td>4.29</td>
<td>10.05</td>
<td>4.30</td>
<td>5.99</td>
</tr>
<tr>
<td>9</td>
<td>Commodities and transactions, n.e.s.</td>
<td>3.23</td>
<td>0.00</td>
<td>0.23</td>
<td>4.44</td>
<td>11.42</td>
<td>1.32</td>
</tr>
</tbody>
</table>

Source: WITS (2008) and authors’ calculations.
Table 2. Summary statistics and correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports</td>
<td>226029</td>
<td>25100.1</td>
<td>296128</td>
<td>0</td>
<td>4.31E+07</td>
</tr>
<tr>
<td>Exporter Income</td>
<td>226029</td>
<td>2.95E+12</td>
<td>2.88E+12</td>
<td>1.99E+10</td>
<td>9.63E+12</td>
</tr>
<tr>
<td>Importer Income</td>
<td>196430</td>
<td>7.09E+11</td>
<td>1.61E+12</td>
<td>4.95E+08</td>
<td>9.63E+12</td>
</tr>
<tr>
<td>Distance</td>
<td>207313</td>
<td>6935.02</td>
<td>4977.62</td>
<td>173.524</td>
<td>19586.2</td>
</tr>
<tr>
<td>Ad-valorem tariff</td>
<td>195365</td>
<td>8.72824</td>
<td>6.49074</td>
<td>0</td>
<td>119</td>
</tr>
<tr>
<td>TAI exporter</td>
<td>226029</td>
<td>0.53444</td>
<td>0.14808</td>
<td>0.139</td>
<td>0.733</td>
</tr>
<tr>
<td>TAI importer</td>
<td>193854</td>
<td>0.3639</td>
<td>0.22088</td>
<td>0</td>
<td>0.744</td>
</tr>
<tr>
<td>Time to export</td>
<td>199841</td>
<td>22.9771</td>
<td>16.1429</td>
<td>3</td>
<td>139</td>
</tr>
<tr>
<td>Time to import</td>
<td>226029</td>
<td>12.5176</td>
<td>6.07162</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td>Documents to export</td>
<td>199841</td>
<td>5.1109</td>
<td>3.61971</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Documents to import</td>
<td>226029</td>
<td>12.5176</td>
<td>6.07162</td>
<td>6</td>
<td>31</td>
</tr>
</tbody>
</table>

Correlations

<table>
<thead>
<tr>
<th>Transformed variables</th>
<th>Ln exports</th>
<th>Income</th>
<th>Distance</th>
<th>Tariff</th>
<th>TAI</th>
<th>Time</th>
<th>Transport Costs</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln exports</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>0.383</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance</td>
<td>-0.238</td>
<td>-0.166</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariff</td>
<td>-0.058</td>
<td>-0.137</td>
<td>0.022</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAI</td>
<td>0.322</td>
<td>0.492</td>
<td>-0.085</td>
<td>-0.181</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>-0.265</td>
<td>-0.303</td>
<td>-0.024</td>
<td>0.095</td>
<td>-0.712</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Costs</td>
<td>-0.132</td>
<td>-0.340</td>
<td>0.158</td>
<td>0.050</td>
<td>-0.234</td>
<td>0.288</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Documents</td>
<td>-0.163</td>
<td>-0.092</td>
<td>-0.185</td>
<td>0.004</td>
<td>-0.443</td>
<td>0.695</td>
<td>0.018</td>
<td>1.00</td>
</tr>
</tbody>
</table>

4. Empirical analysis

4.1. Model specification

The empirical strategy is based on the gravity model of trade. The impressive goodness of fit of the gravity model applied to bilateral trade flows is widely recognised. Some authors have referred to this model as the “workhorse” of empirical trade studies (Eichengreen and Irwin, 1998; Cheng and Wall, 2005). In the context of the gravity model, Anderson and van Wincoop (2003) emphasise the dependence of trade on a bilateral and multilateral resistance factor. These authors refer to price indices as “multilateral resistance” variables that depend on all bilateral resistances, including those that do not directly involve the exporting country.

The theoretical background for our study is provided by the model of Baier and Bergstrand (2009). This model is a generalisation of previous work on the gravity equation, in which special attention is given to modelling the so-called “multilateral resistance” terms (MR). Baier and Bergstrand (2009) demonstrated that a first-order log-linear Taylor series expansion of the
nonlinear system of price equations provides an alternative OLS log-linear specification that introduces theoretically motivated MR. This methodology has two basic advantages with respect to the other approaches recently proposed to estimate a “theoretically motivated” gravity equation. Firstly, it is simpler than the custom nonlinear least squares (CNLS) program proposed by Anderson and van Wincoop (2003), which has scarcely been applied by empirical researchers. Secondly, it enables the comparative static effects of a trade costs to be estimated. The most commonly applied approach to estimate potentially unbiased gravity equation coefficients since Anderson and van Wincoop (2003) is to use region-specific fixed effects, as already suggested by the authors and by Feenstra (2004). Although this method is very simple and avoids the measurement error associated with measuring regions’ “internal distances” (as in CNLS), it does not allow estimation of the comparative static effects of trade costs. Moreover, the Anderson and van Wincoop (2003) approach is only valid in a world with symmetrical bilateral trade costs ($t_{ij}=t_{ji}$), whereas the MR approximation terms also work under asymmetrical bilateral trade costs.\footnote{See Addendum to “Bonus Vetus OLS” (B-B, 2007) in http://www.nd.edu/~jbergstr/working_papers.html.}

Baier and Bergstrand (2009) suggest applying a first-order Taylor expansion to the explanatory variables and estimating the gravity model specified with the transformed variables using OLS. By using this methodology, the independent variables are transformed as follows:

$$
(x_{jk})_{P,P} = \frac{1}{N_j} \sum_{i=1}^{N_j} x_{ijk} + \frac{1}{N_j} \sum_{j=1}^{N_j} x_{jik} - \frac{1}{N_j} \sum_{i=1}^{N_j} x_{ijk} \frac{1}{N_j} \sum_{j=1}^{N_j} x_{jik} \quad (1)
$$

$$
(x_{ik}, x_{jk})_{P,P} = \frac{1}{N_j} \sum_{i=1}^{N_j} x_{ik} + \frac{1}{N_j} \sum_{j=1}^{N_j} x_{jk} - \frac{1}{N_j} \sum_{i=1}^{N_j} x_{ik} \frac{1}{N_j} \sum_{j=1}^{N_j} x_{jk} \quad (2)
$$

where $r$ is an index of the country partners of $i$ and $s$ is an index of the country partners of $j$. Equation (1) refers to variables with bilateral variability (e.g. distance), whereas Equation (2) indicates the transformation required for variables with country or sectoral variability, but which are common for all the trading partners. The estimated equation is:

$$
\ln X_{jk} = \alpha_0 + \alpha_1 \ln (Y_i Y_j)_{P,P} + \alpha_2 (\ln Dist_{ij} - \ln Dist_{P,P_j}) + $

$$
+ \alpha_3 (\ln Tariffs_{ijk} - \ln Tariffs_{P,P_j}) + \alpha_4 (\ln ET_i \ln ET_j)_{P,P_j} + \varepsilon_{ijk} \quad (3)
$$

where $\ln$ denotes natural logarithms. $X_{ik}$ denotes the value of exports of commodity $k$ from country $i$ to country $j$; $Y_i$ and $Y_j$ are incomes in the origin and destination market respectively; $Dist_{ij}$ is the geographical great circle distance in kilometres between the most important cities (in terms of population) of countries $i$ and $j$. $\text{Tariif}_{ijk}$ is the weighted average effectively applied tariff for each
country importing each commodity from the 13 exporters.\footnote{This variable is disaggregated at 1 digit level (SITC classification).} ET_{i}, and ET_{j} are easy-to-trade variables (technological innovation, internal transport costs, time and number of documents required to trade) for the exporting and importing country respectively. Technological innovation is measured as the product of the Technological Achievement Index (TAI) of countries \(i\) and \(j\), internal transport costs is measured as the product of the fees levied on a 20-foot container in US dollars in countries \(i\) and \(j\). All the fees associated with completing the procedures to export or import goods are included. Documents is measured as the product of the number of documents required to trade in countries \(i\) and \(j\). Finally, \(\varepsilon_{ijk}\) is the error term, which is assumed to be independently and identically distributed.

4.2. Main results

Table 3 shows the results obtained for the full sample. Note that due to the complementarity of the ET variables considered, models 1-4 include separately each trade facilitation variable, namely technological innovation, transport costs, number of days and number of documents required to trade, respectively. In order to improve the measure of ET, we also computed an average ET that is calculated as the simple average of the transformed variables:

\[
\frac{1}{3} \sum_{m=1}^{3} (x_{ik}x_{jk})_{p,p} / 3,
\]

where \(x\) denotes time, internal transport costs and number of documents. The results obtained when including this variable are shown in Table 5.

Tariff barriers are negative and significant, as expected, although the coefficients obtained for trade facilitation variables are higher. On one hand, technological innovation is positive and significant, indicating that improving service infrastructure fosters international trade. On the other hand, inland transport costs, the number of documents and days required to export deter international trade flows. This deterrent effect is greater for variables related to bureaucratic procedures and waiting time at the border than for internal transport costs. Additionally, our results show the expected negative effect of distance on trade.

These results were similar to those found in the estimates with exporter and importer fixed effects. In particular, the elasticity for distance was -0.54 (0.006), for tariff barriers was -0.02 (0.001) and for time delays was -0.32 (0.06).\footnote{Robust standard errors in brackets.}

Since each variable is measured in different units, we calculate beta coefficients to be able to compare the magnitude of the effects in terms of standard deviations. The beta coefficients are shown in Table A.2 in the Appendix. The highest beta coefficients are, in absolute value, for distance, income and some trade facilitation variables, especially time to trade, technological innovation and number of documents whereas tariff barriers and internal transport costs show lower beta coefficients. These results indicate that trade facilitation variables play a more
important role as determinants of trade patterns than do tariff barriers. The interpretation is as follows. For example, changing the time to trade by one standard deviation, holding constant the other explanatory variables, would increase exports by 0.17 standard deviations, whereas the effect of a reduction of the average distance by one standard deviation would increase exports by 0.2 standard deviations. Thus we can conclude that a change in distance has a slightly greater relative effect on exports than does a change in time to trade.

Finally, with respect to the goodness of fit of the model, the R squared indicates that the model is able to explain only around twenty percent of the variability of sectoral exports. This low explanatory power, in comparison to the high explanatory power of the model when aggregated trade data are used is common to other gravity model estimations using disaggregated data.

Table 3. Determinants of bilateral trade.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>0.32***</td>
<td>0.36***</td>
<td>0.31***</td>
<td>0.34***</td>
<td>0.26***</td>
</tr>
<tr>
<td></td>
<td>(119.90)</td>
<td>(169.64)</td>
<td>(143.62)</td>
<td>(162.69)</td>
<td>(104.64)</td>
</tr>
<tr>
<td>Distance</td>
<td>-0.50***</td>
<td>-0.48***</td>
<td>-0.50***</td>
<td>-0.51***</td>
<td>-0.433 ***</td>
</tr>
<tr>
<td></td>
<td>(-72.22)</td>
<td>(-75.38)</td>
<td>(-78.71)</td>
<td>(-80.91)</td>
<td>(-78.46)</td>
</tr>
<tr>
<td>Tariffs</td>
<td>-0.03***</td>
<td>-0.03***</td>
<td>-0.03***</td>
<td>-0.02***</td>
<td>0.031***</td>
</tr>
<tr>
<td></td>
<td>(-18.87)</td>
<td>(-17.49)</td>
<td>(-18.22)</td>
<td>(-14.90)</td>
<td>(4.31)</td>
</tr>
<tr>
<td>Technological</td>
<td>0.57***</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.811***</td>
</tr>
<tr>
<td>innovation</td>
<td>(69.16)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(37.978)</td>
</tr>
<tr>
<td>Transport costs</td>
<td>-</td>
<td>-0.04***</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>(-6.07)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Time</td>
<td>-</td>
<td>-</td>
<td>-0.39***</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>(-81.47)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Documents</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.52***</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(-65.65)</td>
<td>-</td>
</tr>
<tr>
<td>ET-average</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.365***</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(-33.47)</td>
</tr>
<tr>
<td>Number of</td>
<td>153,289</td>
<td>183,422</td>
<td>183,422</td>
<td>183,422</td>
<td>166,67</td>
</tr>
<tr>
<td>observations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.21</td>
<td>0.20</td>
<td>0.22</td>
<td>0.22</td>
<td>0.21</td>
</tr>
<tr>
<td>RMSE</td>
<td>1.72</td>
<td>1.69</td>
<td>1.67</td>
<td>1.67</td>
<td>1.65</td>
</tr>
</tbody>
</table>

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. T-statistics are given in brackets. The dependent variable is the natural logarithm of exports in value (thousands of $US) of commodity k from country i to j. The estimation uses White’s heteroscedasticity-consistent standard errors. Data is for the year 2000.

4.3. Robustness

In this section we present estimates of the extended gravity model for different exporters and different types of goods to account for possible sources of heterogeneity in the sample.
4.3.1. The effect of tariff barriers and trade facilitation measures on imports from different countries

The level of protection for goods coming from developing countries face lower average weighted tariffs in developed countries than in developing countries; however, developing countries face higher tariffs in developed countries than those applied to developed countries trading among themselves (Table A.3). Average weighted tariffs equal to zero are more frequent among developed countries. Indeed, the second part of Table A.3 shows that the mean of the effectively applied weighted tariffs among developed countries is 4.5%, while it is much higher when one (or both) of the trading partners is a developing country (10.6%). This phenomenon is known as “tariff bias” against developing countries.

To focus on the effect of trade barriers on imports from different countries, we estimate a separate regression for each of the 13 exporters included in the sample. We analyse the extent to which imports from developed and developing countries are deterred by tariffs and by trade facilitation barriers.

Results of estimating equation (3) are shown in Table 3. With respect to the trade facilitation variables, 85% of the estimated coefficients present the expected sign. UK, Germany and China exports face the largest elasticity with respect to number of documents needed to trade. A possible explanation could be that more complicated procedures are required for goods coming from larger exporters whose exports are very competitive, as a means of deterring stronger competitors from accessing the market.

Overall, trade facilitation variables are of greater importance than tariff barriers. Tariffs present higher elasticity for goods exported from the United States, Australia, Germany and South Africa, whereas for Brazil, Chile, Ghana and Japan this variable is non-significant.

Additionally, the magnitude of the coefficient of the inland transport cost variable for exporters located far away from the main markets (Australia, China and Japan) is considerably higher than the average value obtained in Table 3. As the transport cost variable includes only internal transport costs, and we control for distance in the model, the question that arises is why products exported from Australia, China and Japan face greater elasticity with respect to internal transport costs. A possible explanation is that importers easily can substitute goods coming from those locations with goods coming from closer exporters with lower internal transport costs.

Otherwise, results obtained for middle-income and low-income countries such as Bolivia, Brazil, Chile, Czech Republic and Ghana are less robust. Trade facilitation variables are not significant in a number of cases (Chile, Ghana) or do not show the expected sign (Bolivia, Czech Republic). This result could be due to the reduced size of the sample or to the importance of other factors, such as exchange rates or infrastructures, which could be the main determinants of exports in developing countries.
Table 4. Determinants of exports from each of the 13 exporting countries.

<table>
<thead>
<tr>
<th>Exporting country</th>
<th>Tariffs</th>
<th>Technological innovation</th>
<th>Transport costs</th>
<th>Time</th>
<th>Documents</th>
<th>Observations</th>
<th>R-squared</th>
<th>RMSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>-0.06*** (-4.87)</td>
<td>0.36*** (7.54)</td>
<td>-0.49*** (-12.80)</td>
<td>-0.20*** (-7.82)</td>
<td>0.06* (1.78)</td>
<td>7150</td>
<td>0.02</td>
<td>1.70</td>
</tr>
<tr>
<td>Bolivia</td>
<td>-0.02 (-0.88)</td>
<td>-0.76** (-2.05)</td>
<td>-0.11 (-0.50)</td>
<td>0.47** (2.14)</td>
<td>0.44** (2.03)</td>
<td>301</td>
<td>0.02</td>
<td>1.52</td>
</tr>
<tr>
<td>Brazil</td>
<td>-0.01 (-0.73)</td>
<td>0.02 (0.27)</td>
<td>0.11*** (2.94)</td>
<td>0.00 (0.01)</td>
<td>0.01 (0.37)</td>
<td>8559</td>
<td>0.05</td>
<td>1.63</td>
</tr>
<tr>
<td>Chile</td>
<td>0.01 (0.57)</td>
<td>0.14 (1.18)</td>
<td>-0.02 (-0.33)</td>
<td>-0.05 (-0.90)</td>
<td>0.01 (0.07)</td>
<td>2775</td>
<td>0.07</td>
<td>1.59</td>
</tr>
<tr>
<td>China</td>
<td>0.04*** (3.73)</td>
<td>0.66*** (23.51)</td>
<td>-0.62*** (-25.87)</td>
<td>-0.59*** (-33.64)</td>
<td>-0.67*** (-23.35)</td>
<td>18495</td>
<td>0.17</td>
<td>1.77</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>-0.02*** (-3.00)</td>
<td>0.51*** (7.43)</td>
<td>0.36*** (7.43)</td>
<td>0.07** (2.34)</td>
<td>0.08 (1.56)</td>
<td>3939</td>
<td>0.03</td>
<td>1.41</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.06*** (-11.81)</td>
<td>1.21*** (47.81)</td>
<td>-0.16*** (-8.25)</td>
<td>-0.58*** (-43.94)</td>
<td>-0.76*** (-36.63)</td>
<td>26547</td>
<td>0.21</td>
<td>1.73</td>
</tr>
<tr>
<td>Ghana</td>
<td>0.03 (1.63)</td>
<td>0.29 (0.78)</td>
<td>-0.03 (-0.15)</td>
<td>-0.22 (-1.53)</td>
<td>-0.19 (-1.05)</td>
<td>306</td>
<td>0.03</td>
<td>1.66</td>
</tr>
<tr>
<td>Japan</td>
<td>0.01 (0.60)</td>
<td>0.53*** (14.47)</td>
<td>-0.63*** (-21.35)</td>
<td>-0.50*** (-23.80)</td>
<td>-0.34*** (-11.19)</td>
<td>15901</td>
<td>0.14</td>
<td>1.94</td>
</tr>
<tr>
<td>South Africa</td>
<td>-0.05*** (-3.77)</td>
<td>-0.15*** (-3.90)</td>
<td>0.12*** (4.18)</td>
<td>0.02 (0.84)</td>
<td>0.11*** (2.90)</td>
<td>6326</td>
<td>0.03</td>
<td>1.57</td>
</tr>
<tr>
<td>Spain</td>
<td>0.02*** (3.53)</td>
<td>0.41*** (13.02)</td>
<td>0.07*** (3.51)</td>
<td>-0.21** (-12.78)</td>
<td>-0.12*** (-5.05)</td>
<td>16043</td>
<td>0.13</td>
<td>1.55</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>-0.03*** (-4.43)</td>
<td>0.85*** (35.27)</td>
<td>-0.24*** (-12.66)</td>
<td>-0.54*** (-39.49)</td>
<td>-0.71*** (-33.63)</td>
<td>22004</td>
<td>0.18</td>
<td>1.62</td>
</tr>
<tr>
<td>United States</td>
<td>-0.15*** (-10.50)</td>
<td>0.87*** (22.88)</td>
<td>-0.24*** (-8.07)</td>
<td>-0.37*** (-19.35)</td>
<td>-0.43*** (-17.07)</td>
<td>21539</td>
<td>0.17</td>
<td>1.93</td>
</tr>
</tbody>
</table>

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. T-statistics are given in brackets. All regressions include income and distance variables, the coefficients are not reported to save space. The dependent variable is the natural logarithm of exports in value (thousands of $US) of commodity k from country i to j. The estimation uses White’s heteroscedasticity-consistent standard errors. Data is for the year 2000. Number of observations, R-squared and RMSE correspond to regression including technological innovation as a trade facilitation measure.

4.3.2. The effect of tariff barriers and trade facilitation measures in different sectors

In this section, the effects of trade barriers and trade facilitation variables on trade for different sectors are analysed and compared. Two classifications are considered. Firstly, the model is estimated for differentiated, reference-priced and homogeneous goods according to the Rauch classification. High-technology goods, as defined in the OECD (2001) and Eurostat (1999) classifications are also considered as a separate category. Secondly, the model is estimated for each of the sections of the SITC (Sections 0-9). Table 5 shows the main results.

When Rauch’s classification and high-technology sectors are considered, results show that trade facilitation improvements would benefit differentiated, reference-priced and high-technology sectors more than homogeneous goods. High-technology goods, as defined in the OECD (2001) and Eurostat (1999) classifications, are included as a separate category.

---

11 The list of high-technology sectors considered to create the technology dummy is available upon request from the authors.
12 See Table A.4 in the Appendix for a description of each Section.
products to a greater extent than homogeneous goods. This result is in line with the assumption that the search model developed by Rauch (1999) applies most strongly to differentiated products and most weakly to products traded on organised exchanges. Hence, trade facilitation variables should have the greatest effects on matching international buyers and sellers of differentiated products, and search costs should act as the greatest barrier to trade in differentiated products.

In relation to the second classification, the coefficient of tariffs is negative and significant (excluding Sections 2 and 9) and shows elasticity between -0.01 and –0.05. According to the results obtained, the greatest tariff elasticities are found in sensitive products such as food and live animals; mineral fuels, lubricants and related materials; and animal and vegetable oils, fats and waxes. These results can be compared with those obtained by other authors. For example, Fink et al. (2005) also estimate a sectoral gravity equation using trade flows classified according to Rauch classification. These authors find that the estimated coefficient for the tariff variable is not statistically different from zero in the case of differentiated goods, whereas it is negative and statistically significant in the case of reference-priced and homogeneous goods. Along the same lines, Tang (2006) analyses the factors that contribute to the growth of US imports in differentiated, reference-priced and homogeneous goods. Although US tariffs on differentiated goods were reduced by 2.25% in the period 1975-2000, this reduction explains only 0.2% of the growth in US imports of differentiated goods. Meanwhile, the contribution of decreasing tariff barriers to the growth of US imports is about 8% for reference-priced and 13.7% for homogeneous goods. Tariff barriers therefore play a more important role for trade in reference-priced and homogeneous goods.

In relation to trade facilitation variables, results show that improvements in service infrastructure (measured as countries’ technological achievement), and reducing the number of days and documents required for trade are of greater importance than internal transport costs (which include all the official fees associated with completing the procedures to export or import goods). Nonetheless, transport costs play an important role in the case of trade of goods included in Section 8 and high-technology goods.
Table 5. Determinants of bilateral trade. Different sectors.

<table>
<thead>
<tr>
<th>Rauch Classification</th>
<th>Tariffs</th>
<th>Technological innovation</th>
<th>Transport costs</th>
<th>Time</th>
<th>Documents</th>
<th>Observations</th>
<th>R-squared</th>
<th>RMSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differentiated</td>
<td>-0.02***</td>
<td>0.63***</td>
<td>-0.06***</td>
<td>-0.43***</td>
<td>-0.61***</td>
<td>95856</td>
<td>0.24</td>
<td>1.69</td>
</tr>
<tr>
<td>Referenced</td>
<td>-0.04***</td>
<td>0.57***</td>
<td>0.04***</td>
<td>-0.36***</td>
<td>-0.48***</td>
<td>36178</td>
<td>0.19</td>
<td>1.62</td>
</tr>
<tr>
<td>Homogeneous</td>
<td>-0.05***</td>
<td>0.11**</td>
<td>0.04</td>
<td>-0.15***</td>
<td>-0.11***</td>
<td>7700</td>
<td>0.08</td>
<td>1.92</td>
</tr>
<tr>
<td>High-technology</td>
<td>-0.02**</td>
<td>0.94***</td>
<td>-0.15***</td>
<td>-0.59***</td>
<td>-0.76***</td>
<td>27776</td>
<td>0.34</td>
<td>1.70</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sections SITC T-Digit level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 0</td>
</tr>
<tr>
<td>-0.04***</td>
</tr>
<tr>
<td>(-8.25)</td>
</tr>
<tr>
<td>Section 1</td>
</tr>
<tr>
<td>-0.02*</td>
</tr>
<tr>
<td>(-1.72)</td>
</tr>
<tr>
<td>Section 2</td>
</tr>
<tr>
<td>-0.01</td>
</tr>
<tr>
<td>(-1.4)</td>
</tr>
<tr>
<td>Section 3</td>
</tr>
<tr>
<td>-0.05***</td>
</tr>
<tr>
<td>(-3.14)</td>
</tr>
<tr>
<td>Section 4</td>
</tr>
<tr>
<td>-0.05***</td>
</tr>
<tr>
<td>(-2.87)</td>
</tr>
<tr>
<td>Section 5</td>
</tr>
<tr>
<td>-0.03***</td>
</tr>
<tr>
<td>(-6.52)</td>
</tr>
<tr>
<td>Section 6</td>
</tr>
<tr>
<td>-0.04***</td>
</tr>
<tr>
<td>(-13.43)</td>
</tr>
<tr>
<td>Section 7</td>
</tr>
<tr>
<td>-0.02***</td>
</tr>
<tr>
<td>(-5.11)</td>
</tr>
<tr>
<td>Section 8</td>
</tr>
<tr>
<td>-0.01**</td>
</tr>
<tr>
<td>(-3.10)</td>
</tr>
<tr>
<td>Section 9</td>
</tr>
<tr>
<td>-0.02</td>
</tr>
<tr>
<td>(-0.75)</td>
</tr>
</tbody>
</table>

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. T-statistics are given in brackets. The dependent variable is the natural logarithm of exports in value (thousands of $US) of commodity k from country i to j. The estimation uses White’s heteroscedasticity-consistent standard errors. Data is for the year 2000. Number of observations, R-squared and RMSE correspond to regression including technological innovation as a trade facilitation measure.

5. Simulations and policy implications

Using the estimated elasticities presented in Table 4, we are able to simulate the increase in exports for several countries derived from taking the country to the sample average. China, Germany, Japan, the United Kingdom and the United States are the exporting countries considered in the simulations since they present the most robust results. Table 6 presents the increase in exports associated to reductions in the cost to import, in the days, and documents needed to import in those countries with trade facilitation measures above the sample average. Simulations are presented for several groups of importers: low-income, middle-income, high-income non-OECD and high-income OECD countries.

Columns (1), (4) and (7) show the average cost to import, time for import and number of documents for import in low-income, middle-income, high-income non-OECD and high-income OECD countries. Columns (2), (5) and (8) show the percentage reduction necessary to take the group of countries to the sample average. Finally, columns (3), (6) and (9) show the
changes in trade flows for different exporters derived from taking the importing economic regions to the sample average.

Then, Table 6 presents the increase in trade flows which would take place if the importing countries were to reduce the cost, time and documents to the sample average. For example, if low-income countries were to reduce the average days for imports to the average (the reduction needed would be of 55%),\(^{13}\) exports from China would increase by 33%. Overall, results show that Asian countries (China and Japan) would increase their exports to a higher extent if the cost to import in middle-income countries would be reduced to the sample average. Otherwise, the European countries considered (Germany and the United Kingdom) and the United States would benefit the most, in terms of increasing exports, if low-income and middle-income were to reduce the average days for imports to the average. Moreover, all the exporters considered would increase exports considerably if high-income non-OECD countries would reduce their number of documents needed to import and if high-income OECD countries would reduce their cost to import.

\(^{13}\) This percentage changes since it is calculated as the simple average of trade facilitation measures in countries importing from China, Germany, Japan, the United Kingdom and the United States, which export to different destinations.
Table 6. Changes in trade flows with improvement in cost, days and documents at the border.

<table>
<thead>
<tr>
<th>Country</th>
<th>(1) Cost to import</th>
<th>(2) % reduction to the average</th>
<th>(3) % increase in exports</th>
<th>(4) Time for import (days)</th>
<th>(5) % reduction to the average</th>
<th>(6) % increase in exports</th>
<th>(7) Documents for import</th>
<th>(8) % reduction to the average</th>
<th>(9) % increase in exports</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>2394.37</td>
<td>-47.64</td>
<td>29.54</td>
<td>65.03</td>
<td>-55.25</td>
<td>32.6</td>
<td>13.46</td>
<td>-32.07</td>
<td>21.49</td>
</tr>
<tr>
<td>Middle Income</td>
<td>1746.24</td>
<td>-30.12</td>
<td>18.68</td>
<td>34.11</td>
<td>-9.86</td>
<td>5.82</td>
<td>9.68</td>
<td>-3.63</td>
<td>2.43</td>
</tr>
<tr>
<td>High Inc. Non-OECD</td>
<td>1138.5</td>
<td>-4.26</td>
<td>2.64</td>
<td>25.5</td>
<td>-4.35</td>
<td>2.57</td>
<td>11</td>
<td>-23.83</td>
<td>15.97</td>
</tr>
<tr>
<td>High Income OECD</td>
<td>1301.2</td>
<td>-15.81</td>
<td>9.8</td>
<td>19.2</td>
<td>-</td>
<td>8.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>2394.37</td>
<td>-47.51</td>
<td>7.6</td>
<td>65.03</td>
<td>-56.63</td>
<td>32.84</td>
<td>13.46</td>
<td>-33.25</td>
<td>25.27</td>
</tr>
<tr>
<td>Middle Income</td>
<td>1763.97</td>
<td>-30.77</td>
<td>4.92</td>
<td>33.92</td>
<td>-11.83</td>
<td>6.86</td>
<td>9.65</td>
<td>-4.76</td>
<td>3.62</td>
</tr>
<tr>
<td>High Inc. Non-OECD</td>
<td>1138.5</td>
<td>-4.02</td>
<td>0.64</td>
<td>25.5</td>
<td>-7.3</td>
<td>4.23</td>
<td>11</td>
<td>-25.15</td>
<td>19.12</td>
</tr>
<tr>
<td>High Income OECD</td>
<td>1301.2</td>
<td>-15.6</td>
<td>2.5</td>
<td>19.2</td>
<td>-</td>
<td>8.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>2394.37</td>
<td>-51.6</td>
<td>32.51</td>
<td>65.03</td>
<td>-59.64</td>
<td>29.82</td>
<td>13.46</td>
<td>-33.77</td>
<td>11.48</td>
</tr>
<tr>
<td>Middle Income</td>
<td>1637.56</td>
<td>-30.5</td>
<td>19.21</td>
<td>33.64</td>
<td>-19.56</td>
<td>9.78</td>
<td>9.64</td>
<td>-5.94</td>
<td>2.02</td>
</tr>
<tr>
<td>High Inc. Non-OECD</td>
<td>1138.5</td>
<td>-11.49</td>
<td>7.24</td>
<td>25.5</td>
<td>-13.73</td>
<td>6.87</td>
<td>11</td>
<td>-25.73</td>
<td>8.75</td>
</tr>
<tr>
<td>High Income OECD</td>
<td>1228</td>
<td>-16.88</td>
<td>10.63</td>
<td>16.86</td>
<td>-</td>
<td>7.86</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>UK</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>2394.37</td>
<td>-48.34</td>
<td>11.6</td>
<td>65.03</td>
<td>-58.73</td>
<td>31.72</td>
<td>13.46</td>
<td>-34.44</td>
<td>24.45</td>
</tr>
<tr>
<td>Middle Income</td>
<td>1729.08</td>
<td>-30.26</td>
<td>7.26</td>
<td>34.03</td>
<td>-17.16</td>
<td>9.27</td>
<td>9.77</td>
<td>-7.77</td>
<td>5.52</td>
</tr>
<tr>
<td>High Inc. Non-OECD</td>
<td>1138.5</td>
<td>-5.52</td>
<td>1.33</td>
<td>25.5</td>
<td>-11.8</td>
<td>6.37</td>
<td>11</td>
<td>-26.48</td>
<td>18.8</td>
</tr>
<tr>
<td>High Income OECD</td>
<td>1301.2</td>
<td>-16.92</td>
<td>4.06</td>
<td>19.2</td>
<td>-</td>
<td>8.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>USA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>2394.37</td>
<td>-51.68</td>
<td>12.4</td>
<td>65.03</td>
<td>-62.45</td>
<td>23.11</td>
<td>13.46</td>
<td>-36.97</td>
<td>15.9</td>
</tr>
<tr>
<td>Middle Income</td>
<td>1637.56</td>
<td>-30.62</td>
<td>7.35</td>
<td>33.64</td>
<td>-25.16</td>
<td>9.31</td>
<td>9.64</td>
<td>-10.49</td>
<td>4.51</td>
</tr>
<tr>
<td>High Inc. Non-OECD</td>
<td>1138.5</td>
<td>-11.65</td>
<td>2.8</td>
<td>25.5</td>
<td>-19.74</td>
<td>7.3</td>
<td>11</td>
<td>-29.32</td>
<td>12.61</td>
</tr>
<tr>
<td>High Income OECD</td>
<td>1228</td>
<td>-17.02</td>
<td>4.08</td>
<td>16.86</td>
<td>-</td>
<td>7.86</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: The elasticities used for the simulations are the simple average coefficient obtained in Table 4 for China, Germany, Japan, the United Kingdom and the United States: -0.38 for transport costs, -0.52 for time to trade and -0.58 for documents to trade. Empty cells indicate trade facilitation measures that are below the sample average.
6. Conclusions

In this paper, the effect of reducing trade barriers is analysed and compared with the effect of improving trade facilitation using sectoral data, since disaggregation allows a more accurate analysis of policies for different products. Time, number of documents and cost of trade, as well as information technology achievements are used as proxies for trade facilitation, while tariffs are measured as the weighted average effectively applied tariffs for each country importing each product from the 13 exporters in the sample.

Overall, the main results indicate that trade facilitation variables are, in relative terms, much more important than tariffs, and this result is also obtained for specific countries and sectors. The single-exporter regressions indicate that our model performs better for developed countries than for developing exporters, for which other factors, such as exchange rates, market access or infrastructures, could be the main determinants of exports.

The results for specific types of goods indicate that trade facilitation improvements would benefit trade in differentiated and high-technology sectors to a greater extent than trade in homogeneous goods, basically due to the different weight of fixed costs that both groups of products are assuming.

Finally, some simulations show that China and Japan would increase their exports significantly if the cost to import in middle-income countries would be reduced to the sample average, whereas Germany, the United Kingdom and the United States would benefit the most, in terms of increasing exports, if low-income and middle-income were to reduce the average days for imports to the sample average. According to these findings, trade policy negotiation efforts should focus on facilitating trade processes and should be at the forefront of multilateral negotiations.
References

- World Bank (2005), World Development Indicators, Washington, DC.
### Appendix

#### Table A.1. Importing countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>AFG</td>
</tr>
<tr>
<td>Albania</td>
<td>ALB</td>
</tr>
<tr>
<td>Algeria</td>
<td>DZA</td>
</tr>
<tr>
<td>Angola</td>
<td>AGO</td>
</tr>
<tr>
<td>Argentina</td>
<td>ARG</td>
</tr>
<tr>
<td>Armenia</td>
<td>ARM</td>
</tr>
<tr>
<td>Australia</td>
<td>AUS</td>
</tr>
<tr>
<td>Austria</td>
<td>AUT</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>AZE</td>
</tr>
<tr>
<td>Bahamas</td>
<td>BHS</td>
</tr>
<tr>
<td>Bahrain</td>
<td>BHR</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>BGD</td>
</tr>
<tr>
<td>Barbados</td>
<td>BRB</td>
</tr>
<tr>
<td>Belarus</td>
<td>BLR</td>
</tr>
<tr>
<td>Belgium-Lux.</td>
<td>BEL</td>
</tr>
<tr>
<td>Belize</td>
<td>BLZ</td>
</tr>
<tr>
<td>Benin</td>
<td>BEN</td>
</tr>
<tr>
<td>Bermuda</td>
<td>BMU</td>
</tr>
<tr>
<td>Bolivia</td>
<td>BOL</td>
</tr>
<tr>
<td>Bosnia Herzg</td>
<td>BIH</td>
</tr>
<tr>
<td>Brazil</td>
<td>BRA</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>BGR</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>BFA</td>
</tr>
<tr>
<td>Burundi</td>
<td>BDI</td>
</tr>
<tr>
<td>Cambodia</td>
<td>KHM</td>
</tr>
<tr>
<td>Cameroon</td>
<td>CMR</td>
</tr>
<tr>
<td>Canada</td>
<td>CAN</td>
</tr>
<tr>
<td>Chad</td>
<td>TCD</td>
</tr>
<tr>
<td>Chile</td>
<td>CHL</td>
</tr>
<tr>
<td>China</td>
<td>CHN</td>
</tr>
<tr>
<td>China HK SAR</td>
<td>HKG</td>
</tr>
<tr>
<td>China MC SAR</td>
<td>MAC</td>
</tr>
<tr>
<td>Colombia</td>
<td>COL</td>
</tr>
<tr>
<td>Congo</td>
<td>COG</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>CRI</td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>CIV</td>
</tr>
<tr>
<td>Croatia</td>
<td>HRV</td>
</tr>
<tr>
<td>Cuba</td>
<td>CUB</td>
</tr>
<tr>
<td>Cyprus</td>
<td>CYP</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>CZE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>DNK</td>
</tr>
<tr>
<td>Djibouti</td>
<td>DJI</td>
</tr>
<tr>
<td>Dominican Rep.</td>
<td>DOM</td>
</tr>
<tr>
<td>Ecuador</td>
<td>ECU</td>
</tr>
<tr>
<td>Egypt</td>
<td>EGY</td>
</tr>
<tr>
<td>El Salvador</td>
<td>SLV</td>
</tr>
<tr>
<td>Eq Guinea</td>
<td>GNQ</td>
</tr>
<tr>
<td>Estonia</td>
<td>EST</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>ETH</td>
</tr>
<tr>
<td>Fiji</td>
<td>FJI</td>
</tr>
<tr>
<td>Gabon</td>
<td>GAB</td>
</tr>
<tr>
<td>Gambia</td>
<td>GMB</td>
</tr>
<tr>
<td>Georgia</td>
<td>GEO</td>
</tr>
<tr>
<td>Germany</td>
<td>DEU</td>
</tr>
<tr>
<td>Ghana</td>
<td>GHA</td>
</tr>
<tr>
<td>Gibraltar</td>
<td>GIB</td>
</tr>
<tr>
<td>Greece</td>
<td>GRC</td>
</tr>
<tr>
<td>Guatemala</td>
<td>GTM</td>
</tr>
<tr>
<td>Guinea</td>
<td>GIN</td>
</tr>
<tr>
<td>Germany</td>
<td>DEU</td>
</tr>
<tr>
<td>Ghana</td>
<td>GHA</td>
</tr>
<tr>
<td>Gilbraltar</td>
<td>GIB</td>
</tr>
<tr>
<td>Greece</td>
<td>GRC</td>
</tr>
<tr>
<td>Guatemala</td>
<td>GUA</td>
</tr>
<tr>
<td>Guinea</td>
<td>GIN</td>
</tr>
<tr>
<td>Guiana</td>
<td>GUY</td>
</tr>
<tr>
<td>Haiti</td>
<td>HTI</td>
</tr>
<tr>
<td>Honduras</td>
<td>HND</td>
</tr>
<tr>
<td>Hungary</td>
<td>HUN</td>
</tr>
<tr>
<td>Iceland</td>
<td>ISL</td>
</tr>
<tr>
<td>Indonesia</td>
<td>IDN</td>
</tr>
<tr>
<td>Iran</td>
<td>IRN</td>
</tr>
<tr>
<td>Iraq</td>
<td>IRQ</td>
</tr>
<tr>
<td>Israel</td>
<td>ISR</td>
</tr>
<tr>
<td>Italy</td>
<td>ITA</td>
</tr>
<tr>
<td>Jamaica</td>
<td>JAM</td>
</tr>
<tr>
<td>Japan</td>
<td>JPN</td>
</tr>
<tr>
<td>Jordan</td>
<td>JOR</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>KAZ</td>
</tr>
<tr>
<td>Kenya</td>
<td>KEN</td>
</tr>
<tr>
<td>Kiribati</td>
<td>KIR</td>
</tr>
<tr>
<td>Korea D P Rep.</td>
<td>PRK</td>
</tr>
<tr>
<td>Korea Rep.</td>
<td>KOR</td>
</tr>
<tr>
<td>Kuwait</td>
<td>KWT</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>KGZ</td>
</tr>
<tr>
<td>Madagascar</td>
<td>MDG</td>
</tr>
<tr>
<td>Malawi</td>
<td>MWI</td>
</tr>
<tr>
<td>Malta</td>
<td>MLI</td>
</tr>
<tr>
<td>Mauritania</td>
<td>MRT</td>
</tr>
<tr>
<td>Mauritius</td>
<td>MUS</td>
</tr>
<tr>
<td>Mexico</td>
<td>MEX</td>
</tr>
<tr>
<td>Mongolia</td>
<td>MNG</td>
</tr>
<tr>
<td>Morocco</td>
<td>MAR</td>
</tr>
<tr>
<td>Mozambique</td>
<td>MOZ</td>
</tr>
<tr>
<td>Myanmar</td>
<td>MMR</td>
</tr>
<tr>
<td>Nepal</td>
<td>NPL</td>
</tr>
<tr>
<td>Neth.Ant.Aruba</td>
<td>ANT</td>
</tr>
<tr>
<td>Netherlands</td>
<td>NLD</td>
</tr>
<tr>
<td>New Caledonia</td>
<td>NCL</td>
</tr>
<tr>
<td>New Zealand</td>
<td>NZL</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>NIC</td>
</tr>
<tr>
<td>Niger</td>
<td>NER</td>
</tr>
<tr>
<td>Nigeria</td>
<td>NGA</td>
</tr>
<tr>
<td>Norway</td>
<td>NOR</td>
</tr>
<tr>
<td>Oman</td>
<td>OMN</td>
</tr>
<tr>
<td>Pakistan</td>
<td>PAK</td>
</tr>
<tr>
<td>Papua N. Guinea</td>
<td>PNG</td>
</tr>
<tr>
<td>Paraguay</td>
<td>PRY</td>
</tr>
<tr>
<td>Peru</td>
<td>PER</td>
</tr>
<tr>
<td>Philippines</td>
<td>PHL</td>
</tr>
<tr>
<td>Poland</td>
<td>POL</td>
</tr>
<tr>
<td>Portugal</td>
<td>PRT</td>
</tr>
<tr>
<td>Qatar</td>
<td>QAT</td>
</tr>
<tr>
<td>Republic Moldova</td>
<td>MD</td>
</tr>
<tr>
<td>Romania</td>
<td>ROM</td>
</tr>
<tr>
<td>Russian Fed.</td>
<td>RUS</td>
</tr>
</tbody>
</table>

Exporting countries: Australia, Bolivia, Brazil, Chile, China, Czech Republic, Germany, Ghana, Japan, South Africa, Spain, United Kingdom, and the United States.
Table A.2. Beta coefficients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>0.32</td>
</tr>
<tr>
<td>Distance</td>
<td>-0.20</td>
</tr>
<tr>
<td>Tariffs</td>
<td>-0.05</td>
</tr>
<tr>
<td>Technological innovation</td>
<td>0.16</td>
</tr>
<tr>
<td>Transport costs</td>
<td>-0.01</td>
</tr>
<tr>
<td>Time</td>
<td>-0.17</td>
</tr>
<tr>
<td>Documents</td>
<td>-0.14</td>
</tr>
</tbody>
</table>

Table A.3. Average weighted tariffs by importer

<table>
<thead>
<tr>
<th>Exporter</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>5725</td>
<td>3.84</td>
<td>7.86</td>
<td>2532</td>
<td>10.60</td>
<td>11.71</td>
</tr>
<tr>
<td>Bolivia</td>
<td>224</td>
<td>5.64</td>
<td>11.83</td>
<td>93</td>
<td>12.57</td>
<td>5.46</td>
</tr>
<tr>
<td>Brazil</td>
<td>6013</td>
<td>4.81</td>
<td>6.51</td>
<td>3806</td>
<td>10.79</td>
<td>8.59</td>
</tr>
<tr>
<td>Chile</td>
<td>1677</td>
<td>6.87</td>
<td>9.10</td>
<td>1391</td>
<td>12.31</td>
<td>5.97</td>
</tr>
<tr>
<td>China</td>
<td>13915</td>
<td>5.09</td>
<td>5.76</td>
<td>9717</td>
<td>15.40</td>
<td>8.83</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2996</td>
<td>5.81</td>
<td>6.83</td>
<td>2208</td>
<td>10.33</td>
<td>10.72</td>
</tr>
<tr>
<td>Germany</td>
<td>21380</td>
<td>3.74</td>
<td>7.27</td>
<td>13849</td>
<td>11.02</td>
<td>8.22</td>
</tr>
<tr>
<td>Ghana</td>
<td>303</td>
<td>0.69</td>
<td>2.26</td>
<td>53</td>
<td>17.55</td>
<td>13.09</td>
</tr>
<tr>
<td>Japan</td>
<td>11893</td>
<td>5.73</td>
<td>16.30</td>
<td>7365</td>
<td>13.99</td>
<td>10.34</td>
</tr>
<tr>
<td>South Africa</td>
<td>4358</td>
<td>5.28</td>
<td>11.54</td>
<td>4052</td>
<td>12.41</td>
<td>8.51</td>
</tr>
<tr>
<td>Spain</td>
<td>12691</td>
<td>3.75</td>
<td>6.54</td>
<td>6980</td>
<td>14.29</td>
<td>9.84</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>18659</td>
<td>3.71</td>
<td>10.03</td>
<td>9754</td>
<td>12.43</td>
<td>18.44</td>
</tr>
<tr>
<td>United States</td>
<td>17320</td>
<td>5.44</td>
<td>21.38</td>
<td>7349</td>
<td>11.71</td>
<td>7.74</td>
</tr>
</tbody>
</table>

Both trading partners are developed

<table>
<thead>
<tr>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Equal to 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>96699</td>
<td>4.48</td>
<td>12.83</td>
<td>33.19%</td>
</tr>
</tbody>
</table>

One or both trading partners are developing

<table>
<thead>
<tr>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Equal to 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>94414</td>
<td>10.59</td>
<td>10.42</td>
<td>4.11%</td>
</tr>
</tbody>
</table>
### Table A.4. Sectoral classification

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Food and live animals</td>
</tr>
<tr>
<td>1</td>
<td>Beverages and tobacco</td>
</tr>
<tr>
<td>2</td>
<td>Crude materials, inedible, except fuels</td>
</tr>
<tr>
<td>3</td>
<td>Mineral fuels, lubricants and related materials</td>
</tr>
<tr>
<td>4</td>
<td>Animal and vegetable oils, fats and waxes</td>
</tr>
<tr>
<td>5</td>
<td>Chemicals and related products, n.e.s.</td>
</tr>
<tr>
<td>6</td>
<td>Manufactured goods classified chiefly by material</td>
</tr>
<tr>
<td>7</td>
<td>Machinery and transport equipment</td>
</tr>
<tr>
<td>8</td>
<td>Miscellaneous manufactured articles</td>
</tr>
<tr>
<td>9</td>
<td>Commodities and transactions not classified elsewhere in the SITC</td>
</tr>
</tbody>
</table>

Figure A.1 Average Applied Tariff Rates (1981-2007)

Source: The World Bank, Trade Research Division.\textsuperscript{14}

Últimos números publicados

159/2000 Participación privada en la construcción y explotación de carreteras de peaje
Ginés de Rus, Manuel Romero y Lourdes Trujillo

160/2000 Errores y posibles soluciones en la aplicación del Value at Risk
Mariano González Sánchez

161/2000 Tax neutrality on saving assets. The spahish case before and after the tax reform
Cristina Ruza y de Paz-Curbera

162/2000 Private rates of return to human capital in Spain: new evidence
F. Barceinas, J. Oliver-Alonso, J.L. Raymond y J.L. Roig-Sabaté

163/2000 El control interno del riesgo. Una propuesta de sistema de límites
riesgo neutral
Mariano González Sánchez

164/2001 La evolución de las políticas de gasto de las Administraciones Públicas en los años 90
Alfonso Utrilla de la Hoz y Carmen Pérez Esparrells

165/2001 Bank cost efficiency and output specification
Emili Tortosa-Ausina

166/2001 Recent trends in Spanish income distribution: A robust picture of falling income inequality
Josep Oliver-Alonso, Xavier Ramos y José Luis Raymond-Bara

167/2001 Efectos redistributivos y sobre el bienestar social del tratamiento de las cargas familiares en
el nuevo IRPF
Nuria Badenes Plá, Julio López Laborda, Jorge Onrubia Fernández

168/2001 The Effects of Bank Debt on Financial Structure of Small and Medium Firms in some Euro-
pean Countries
Mónica Melle-Hernández

169/2001 La política de cohesión de la UE ampliada: la perspectiva de España
Ismael Sanz Labrador

170/2002 Riesgo de liquidez de Mercado
Mariano González Sánchez

171/2002 Los costes de administración para el afiliado en los sistemas de pensiones basados en cuentas
de capitalización individual: medida y comparación internacional.
José Enrique Devesa Carpio, Rosa Rodríguez Barrera, Carlos Vidal Meliá

y propuestas de metodología para la explotación de la información de los ingresos y el gasto.
Llorenè Pou, Joaquín Alegre

173/2002 Modelos paramétricos y no paramétricos en problemas de concesión de tarjetas de credito.
Rosa Puertas, María Bonilla, Ignacio Olmeda
174/2002 Mercado único, comercio intra-industrial y costes de ajuste en las manufacturas españolas. José Vicente Blanes Cristóbal

175/2003 La Administración tributaria en España. Un análisis de la gestión a través de los ingresos y de los gastos. Juan de Dios Jiménez Aguilera, Pedro Enrique Barrilao González


177/2003 Effects of ATMs and Electronic Payments on Banking Costs: The Spanish Case. Santiago Carbó Valverde, Rafael López del Paso, David B. Humphrey

178/2003 Factors explaining the interest margin in the banking sectors of the European Union. Joaquín Maudos y Juan Fernández Guevara

179/2003 Los planes de stock options para directivos y consejeros y su valoración por el mercado de valores en España. Mónica Melle Hernández


181/2003 The Euro effect on the integration of the European stock markets. Mónica Melle Hernández

182/2004 In search of complementarity in the innovation strategy: international R&D and external knowledge acquisition. Bruno Cassiman, Reinhilde Veugelers

183/2004 Fijación de precios en el sector público: una aplicación para el servicio municipal de suministro de agua. Mª Ángeles García Valiñas

184/2004 Estimación de la economía sumergida en España: un modelo estructural de variables latentes. Ángel Alañón Pardo, Miguel Gómez de Antonio

185/2004 Causas políticas y consecuencias sociales de la corrupción. Joan Oriol Prats Cabrera

186/2004 Loan bankers’ decisions and sensitivity to the audit report using the belief revision model. Andrés Guiral Contreras and José A. Gonzalo Angulo

187/2004 El modelo de Black, Derman y Toy en la práctica. Aplicación al mercado español. Marta Tolentino García-Abadillo y Antonio Díaz Pérez

188/2004 Does market competition make banks perform well?. Mónica Melle

189/2004 Efficiency differences among banks: external, technical, internal, and managerial. Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso
190/2004 Una aproximación al análisis de los costes de la esquizofrenia en España: los modelos jerárquicos bayesianos
F. J. Vázquez-Polo, M. A. Negrín, J. M. Cavasés, E. Sánchez y grupo RIRAG

191/2004 Environmental proactivity and business performance: an empirical analysis
Javier González-Benito y Óscar González-Benito

192/2004 Economic risk to beneficiaries in national defined contribution accounts (NDCs)
Carlos Vidal-Meliá, Inmaculada Domínguez-Fabian y José Enrique Devesa-Carpio

193/2004 Sources of efficiency gains in port reform: non parametric malmquist decomposition tfp index for Mexico
Antonio Estache, Beatriz Tovar de la Fé y Lourdes Trujillo

194/2004 Persistencia de resultados en los fondos de inversión españoles
Alfredo Ciriaco Fernández y Rafael Santamaría Aquilué

195/2005 El modelo de revisión de creencias como aproximación psicológica a la formación del juicio del auditor sobre la gestión continuada
Andrés Guiral Contreras y Francisco Esteso Sánchez

196/2005 La nueva financiación sanitaria en España: descentralización y prospectiva
David Cantarero Prieto

197/2005 A cointegration analysis of the Long-Run supply response of Spanish agriculture to the common agricultural policy
José A. Mendez, Ricardo Mora y Carlos San Juan

198/2005 ¿Refleja la estructura temporal de los tipos de interés del mercado español preferencia por la liquidez?
Magdalena Massot Perelló y Juan M. Nave

199/2005 Análisis de impacto de los Fondos Estructurales Europeos recibidos por una economía regional: Un enfoque a través de Matrices de Contabilidad Social
M. Carmen Lima y M. Alejandro Cardenete

200/2005 Does the development of non-cash payments affect monetary policy transmission?
Santiago Carbó Valverde y Rafael López del Paso

201/2005 Firm and time varying technical and allocative efficiency: an application for port cargo handling firms
Ana Rodríguez-Álvarez, Beatriz Tovar de la Fé y Lourdes Trujillo

202/2005 Contractual complexity in strategic alliances
Jeffrey J. Reuer y Africa Ariño

203/2005 Factores determinantes de la evolución del empleo en las empresas adquiridas por opa
Nuria Alcalde Fradejas y Inés Pérez-Soba Aguilar

Elena Olmedo, Juan M. Valderas, Ricardo Gimeno and Lorenzo Escot
205/2005 Precio de la tierra con presión urbana: un modelo para España
Esther Decimavilla, Carlos San Juan y Stefan Sperlich

206/2005 Interregional migration in Spain: a semiparametric analysis
Adolfo Maza y José Villaverde

207/2005 Productivity growth in European banking
Carmen Murillo-Melchor, José Manuel Pastor y Emili Tortosa-Ausina

Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso

209/2005 La elasticidad de sustitución intertemporal con preferencias no separables intratemporalmente: los casos de Alemania, España y Francia.
Elena Márquez de la Cruz, Ana R. Martínez Cañete y Inés Pérez-Soba Aguilar

210/2005 Contribución de los efectos tamaño, book-to-market y momentum a la valoración de activos: el caso español.
Begoña Font-Belaire y Alfredo Juan Grau-Grau

211/2005 Permanent income, convergence and inequality among countries
José M. Pastor and Lorenzo Serrano

212/2005 The Latin Model of Welfare: Do ‘Insertion Contracts’ Reduce Long-Term Dependence?
Luis Ayala and Magdalena Rodríguez

213/2005 The effect of geographic expansion on the productivity of Spanish savings banks
Manuel Illueca, José M. Pastor and Emili Tortosa-Ausina

214/2005 Dynamic network interconnection under consumer switching costs
Ángel Luis López Rodríguez

215/2005 La influencia del entorno socioeconómico en la realización de estudios universitarios: una aproximación al caso español en la década de los noventa
Marta Rahona López

216/2005 The valuation of spanish ipos: efficiency analysis
Susana Álvarez Otero

217/2005 On the generation of a regular multi-input multi-output technology using parametric output distance functions
Sergio Perelman and Daniel Santín

218/2005 La gobernanza de los procesos parlamentarios: la organización industrial del congreso de los diputados en España
Gonzalo Caballero Miguez

219/2005 Determinants of bank market structure: Efficiency and political economy variables
Francisco González

220/2005 Agresividad de las órdenes introducidas en el mercado español: estrategias, determinantes y medidas de performance
David Abad Díaz
221/2005 Tendencia post-anuncio de resultados contables: evidencia para el mercado español
Carlos Forner Rodríguez, Joaquín Marhuenda Fructuoso y Sonia Sanabria García

222/2005 Human capital accumulation and geography: empirical evidence in the European Union
Jesús López-Rodríguez, J. Andrés Faíña y Jose Lopez Rodriguez

223/2005 Auditors' Forecasting in Going Concern Decisions: Framing, Confidence and Information Processing
Waymond Rodgers and Andrés Guiral

José Ramón Cancelo de la Torre, J. Andrés Faíña and Jesús López-Rodríguez

225/2005 The effects of ownership structure and board composition on the audit committee activity: Spanish evidence
Carlos Fernández Méndez and Rubén Arrondo García

226/2005 Cross-country determinants of bank income smoothing by managing loan loss provisions
Ana Rosa Fonseca and Francisco González

Alejandro Estellér Moré

228/2005 Region versus Industry effects: volatility transmission
Pilar Soriano Felipe and Francisco J. Climent Diranzo

Daniel Vázquez-Bustelo and Sandra Valle

Alfonso Palacio-Vera

231/2005 Reconciling Sustainability and Discounting in Cost Benefit Analysis: a methodological proposal
M. Carmen Almansa Sáez and Javier Calatrava Requena

232/2005 Can The Excess Of Liquidity Affect The Effectiveness Of The European Monetary Policy?
Santiago Carbó Valverde and Rafael López del Paso

Miguel Angel Barberán Lahuerta

Víctor M. González

Waymond Rodgers, Paul Pavlou and Andres Guiral.

Francisco J. André, M. Alejandro Cardenete y Carlos Romero.
Santiago Carbó-Valverde, Francisco Rodríguez-Fernández y Gregory F. Udell.

238/2006 Trade Effects Of Monetary Agreements: Evidence For Oecd Countries.
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano.

Marcos Álvarez-Díaz y Gonzalo Caballero Miguez.

240/2006 La interacción entre el éxito competitivo y las condiciones del mercado doméstico como determinantes de la decisión de exportación en las Pymes.
Francisco García Pérez.

241/2006 Una estimación de la depreciación del capital humano por sectores, por ocupación y en el tiempo.
Inés P. Murillo.

Manuel A. Gómez.

Jose Manuel Cordero-Ferrera, Francisco Pedraja-Chaparro y Javier Salinas-Jiménez

244/2006 Did The European Exchange-Rate Mechanism Contribute To The Integration Of Peripheral Countries?.
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano

Marta Pascual and David Cantarero

Salvador Rojí Ferrari and Ana Gonzalez Marcos

247/2006 Testing For Structural Breaks In Variance With additive Outliers And Measurement Errors.
Paulo M.M. Rodrigues and Antonio Rubia

Joaquín Maudos and Juan Fernández de Guevara

Desiderio Romero Jordán, José Félix Sanz Sanz y César Pérez López

250/2006 Regional Income Disparities in Europe: What role for location?.
Jesús López-Rodriguez and J. Andrés Faíña

251/2006 Funciones abreviadas de bienestar social: Una forma sencilla de simultanear la medición de la eficiencia y la equidad de las políticas de gasto público.
Nuria Badenes Plá y Daniel Santín González

252/2006 “The momentum effect in the Spanish stock market: Omitted risk factors or investor behaviour?”.
Luis Muga and Rafael Santamaria

253/2006 Dinámica de precios en el mercado español de gasolina: un equilibrio de colusión tácita.
Jordi Perdiguero García
José M. Pastor, Empar Pons y Lorenzo Serrano

255/2006 Environmental implications of organic food preferences: an application of the impure public goods model.  
Ana María Aldanondo-Ochoa y Carmen Almansa-Sáez

José Félix Sanz-Sanz, Desiderio Romero-Jordán y Santiago Álvarez-García

257/2006 La internacionalización de la empresa manufacturera española: efectos del capital humano genérico y específico.  
José López Rodríguez

María Martínez Torres

259/2006 Efficiency and market power in Spanish banking.  
Rolf Färe, Shawna Grosskopf y Emili Tortosa-Ausina.

Helena Chuliá y Hipòlit Torró.

José Antonio Ortega.

262/2006 Accidentes de tráfico, víctimas mortales y consumo de alcohol.  
José Mª Arranz y Ana I. Gil.

263/2006 Análisis de la Presencia de la Mujer en los Consejos de Administración de las Mil Mayores Empresas Españolas.  
Ruth Mateos de Cabo, Lorenzo Escot Mangas y Ricardo Gimeno Nogués.

Ignacio Álvarez Peralta.

Jaime Vallés-Giménez y Anabel Zárate-Marco.

266/2006 Health Human Capital And The Shift From Foraging To Farming.  
Paolo Rungo.

Juan Luis Jiménez y Jordi Perdiguero.

Desiderio Romero-Jordán y José Félix Sanz-Sanz.

269/2006 Banking competition, financial dependence and economic growth  
Joaquín Maudos y Juan Fernández de Guevara

270/2006 Efficiency, subsidies and environmental adaptation of animal farming under CAP  
Werner Kleinhannß, Carmen Murillo, Carlos San Juan y Stefan Sperlich
Interest Groups, Incentives to Cooperation and Decision-Making Process in the European Union
A. García-Lorenzo y Jesús López-Rodríguez

Riesgo asimétrico y estrategias de momentum en el mercado de valores español
Luis Muga y Rafael Santamaría

Valoración de capital-riesgo en proyectos de base tecnológica e innovadora a través de la teoría de opciones reales
Gracia Rubio Martín

Capital stock and unemployment: searching for the missing link
Ana Rosa Martínez-Cañete, Elena Márquez de la Cruz, Alfonso Palacio-Vera and Inés Pérez-Soba Aguilar

Study of the influence of the voters’ political culture on vote decision through the simulation of a political competition problem in Spain
Sagrario Lantarón, Isabel Lillo, Mª Dolores López and Javier Rodrigo

Investment and growth in Europe during the Golden Age
Antonio Cubel and Mª Teresa Sanchis

Efectos de vincular la pensión pública a la inversión en cantidad y calidad de hijos en un modelo de equilibrio general
Robert Meneu Gaya

El consumo y la valoración de activos
Elena Márquez y Belén Nieto

Economic growth and currency crisis: A real exchange rate entropic approach
David Matesanz Gómez y Guillermo J. Ortega

Three measures of returns to education: An illustration for the case of Spain
María Arrazola y José de Hevia

Composition of Firms versus Composition of Jobs
Antoni Cunyat

La vocación internacional de un holding tranviario belga: la Compagnie Mutuelle de Tramways, 1895-1918
Alberte Martínez López

Una visión panorámica de las entidades de crédito en España en la última década.
Constantino García Ramos

Foreign Capital and Business Strategies: a comparative analysis of urban transport in Madrid and Barcelona, 1871-1925
Alberte Martínez López

Los intereses belgas en la red ferroviaria catalana, 1890-1936
Alberte Martínez López

The Governance of Quality: The Case of the Agrifood Brand Names
Marta Fernández Barcala, Manuel González-Díaz y Emmanuel Raynaud

Modelling the role of health status in the transition out of malthusian equilibrium
Paolo Rungo, Luis Currais and Berta Rivera

Industrial Effects of Climate Change Policies through the EU Emissions Trading Scheme
Xavier Labandeira and Miguel Rodríguez
Globalisation and the Composition of Government Spending: An analysis for OECD countries
Norman Gemmell, Richard Kneller and Ismael Sanz

La producción de energía eléctrica en España: Análisis económico de la actividad tras la liberalización del Sector Eléctrico
Fernando Hernández Martínez

Further considerations on the link between adjustment costs and the productivity of R&D investment: evidence for Spain
Desiderio Romero-Jordán, José Félix Sanz-Sanz and Inmaculada Álvarez-Ayuso

Una teoría sobre la contribución de la función de compras al rendimiento empresarial
Javier González Benito

Agility drivers, enablers and outcomes: empirical test of an integrated agile manufacturing model
Daniel Vázquez-Bustelo, Lucía Avella and Esteban Fernández

Testing the parametric vs the semiparametric generalized mixed effects models
Maria José Lombardía and Stefan Sperlich

Nonlinear dynamics in energy futures
Mariano Matilla-García

Estimating Spatial Models By Generalized Maximum Entropy Or How To Get Rid Of W
Esteban Fernández Vázquez, Matías Mayor Fernández and Jorge Rodríguez-Valez

Optimización fiscal en las transmisiones lucrativas: análisis metodológico
Félix Domínguez Barrero

La situación actual de la banca online en España
Francisco José Climent Diranzo y Alexandre Momparler Pechuán

Estrategia competitiva y rendimiento del negocio: el papel mediador de la estrategia y las capacidades productivas
Javier González Benito y Isabel Suárez González

A Parametric Model to Estimate Risk in a Fixed Income Portfolio
Pilar Abad and Sonia Benito

Análisis Empírico de las Preferencias Sociales Respecto del Gasto en Obra Social de las Cajas de Ahorros
Alejandro Esteller-Moré, Jonathan Jorba Jiménez y Albert Solé-Ollé

Assessing the enlargement and deepening of regional trading blocs: The European Union case
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano

¿Es la Franquicia un Medio de Financiación?: Evidencia para el Caso Español
Vanessa Solís Rodríguez y Manuel González Díaz

On the Finite-Sample Biases in Nonparametric Testing for Variance Constancy
Paulo M.M. Rodrigues and Antonio Rubia

Spain is Different: Relative Wages 1989-98
José Antonio Carrasco Gallego
Poverty reduction and SAM multipliers: An evaluation of public policies in a regional framework
Francisco Javier De Miguel-Vélez y Jesús Pérez-Mayo

La Eficiencia en la Gestión del Riesgo de Crédito en las Cajas de Ahorro
Marcelino Martínez Cabrera

Optimal environmental policy in transport: unintended effects on consumers' generalized price
M. Pilar Socorro and Ofelia Betancor

Agricultural Productivity in the European Regions: Trends and Explanatory Factors
Roberto Ezcurra, Belen Iráizoz, Pedro Pascual and Manuel Rapún

Long-run Regional Population Divergence and Modern Economic Growth in Europe: a Case Study of Spain
María Isabel Ayuda, Fernando Collantes and Vicente Pinilla

Financial Information effects on the measurement of Commercial Banks’ Efficiency
Borja Amor, María T. Tascón and José L. Fanjul

Neutralidad e incentivos de las inversiones financieras en el nuevo IRPF
Félix Domínguez Barrero

The Effects of Corporate Social Responsibility Perceptions on The Valuation of Common Stock
Waymond Rodgers, Helen Choy and Andres Guiral-Contreras

Country Creditor Rights, Information Sharing and Commercial Banks’ Profitability Persistence across the world
Borja Amor, María T. Tascón and José L. Fanjul

¿Es Relevante el Déficit Corriente en una Unión Monetaria? El Caso Español
Javier Blanco González y Ignacio del Rosal Fernández

The Impact of Credit Rating Announcements on Spanish Corporate Fixed Income Performance: Returns, Yields and Liquidity
Pilar Abad, Antonio Díaz and M. Dolores Robles

Indicadores de Lealtad al Establecimiento y Formato Comercial Basados en la Distribución del Presupuesto
Cesar Augusto Bustos Reyes and Óscar González Benito

Migrants and Market Potential in Spain over The XXth Century: A Test Of The New Economic Geography
Daniel A. Tirado, Jordi Pons, Elisenda Paluzie and Javier Silvestre

El Impacto del Coste de Oportunidad de la Actividad Emprendedora en la Intención de los Ciudadanos europeos de Crear Empresas
Luis Miguel Zapico Aldeano

Los belgas y los ferrocarriles de via estrecha en España, 1887-1936
Alberte Martínez López

Competición política bipartidista. Estudio geométrico del equilibrio en un caso ponderado
Isabel Lillo, Mª Dolores López y Javier Rodrigo

Human resource management and environment management systems: an empirical study
Mª Concepción López Fernández, Ana Mª Serrano Bedía and Gema García Piñeres
Wood and industrialization. evidence and hypotheses from the case of Spain, 1860-1935. Iñaki Iriarte-Goñi and María Isabel Ayuda Bosque

New evidence on long-run monetary neutrality. J. Cunado, L.A. Gil-Alana and F. Perez de Gracia

Monetary policy and structural changes in the volatility of us interest rates. Juncal Cuñado, Javier Gomez Biscarri and Fernando Perez de Gracia

The productivity effects of intrafirm diffusion. Lucio Fuentelsaz, Jaime Gómez and Sergio Palomas

Unemployment duration, layoffs and competing risks. J.M. Arranz, C. García-Serrano and L. Toharia

El grado de cobertura del gasto público en España respecto a la UE-15 Nuria Rueda, Begoña Barruso, Carmen Calderón y Mª del Mar Herrador

The Impact of Direct Subsidies in Spain before and after the CAP'92 Reform Carmen Murillo, Carlos San Juan and Stefan Sperlich

Determinants of post-privatisation performance of Spanish divested firms Laura Cabeza García and Silvia Gómez Ansón

¿Por qué deciden diversificar las empresas españolas? Razones oportunistas versus razones económicas Almudena Martínez Campillo

Dynamical Hierarchical Tree in Currency Markets Juan Gabriel Brida, David Matesanz Gómez and Wiston Adrián Risso

Los determinantes sociodemográficos del gasto sanitario. Análisis con microdatos individuales Ana María Angulo, Ramón Barberán, Pilar Egea y Jesús Mur

Why do companies go private? The Spanish case Inés Pérez-Soba Aguilar

The use of gis to study transport for disabled people Verónica Cañal Fernández

The long run consequences of M&A: An empirical application Cristina Bernad, Lucio Fuentelsaz and Jaime Gómez

Las clasificaciones de materias en economía: principios para el desarrollo de una nueva clasificación Valentín Edo Hernández

Reforming Taxes and Improving Health: A Revenue-Neutral Tax Reform to Eliminate Medical and Pharmaceutical VAT Santiago Álvarez-García, Carlos Pestana Barros y Juan Prieto-Rodriguez

Impacts of an iron and steel plant on residential property values Celia Bilbao-Terol

Firm size and capital structure: Evidence using dynamic panel data Víctor M. González and Francisco González
¿Cómo organizar una cadena hotelera? La elección de la forma de gobierno
Marta Fernández Barcala y Manuel González Díaz

Análisis de los efectos de la decisión de diversificar: un contraste del marco teórico “Agencia-Stewardship”
Almudena Martínez Campillo y Roberto Fernández Gago

Selecting portfolios given multiple eurostoxx-based uncertainty scenarios: a stochastic goal programming approach from fuzzy betas
Enrique Ballestero, Blanca Pérez-Gladish, Mar Arenas-Parra and Amelia Bilbao-Terol

“El bienestar de los inmigrantes y los factores implicados en la decisión de emigrar”
Anastasia Hernández Alemán y Carmelo J. León

Andrea Martínez-Noya and Esteban García-Canal

Diferencias salariales entre empresas públicas y privadas. El caso español
Begoña Cueto y Nuria Sánchez- Sánchez

Effects of Fiscal Treatments of Second Home Ownership on Renting Supply
Celia Bilbao Terol and Juan Prieto Rodríguez

Auditors’ ethical dilemmas in the going concern evaluation
Andres Guiral, Waymond Rodgers, Emiliano Ruiz and Jose A. Gonzalo

Convergencia en capital humano en España. Un análisis regional para el periodo 1970-2004
Susana Morales Sequera y Carmen Pérez Esparrells

Socially responsible investment: mutual funds portfolio selection using fuzzy multiobjective programming
Blanca Mª Pérez-Gladish, Mar Arenas-Parra, Amelia Bilbao-Terol and Mª Victoria Rodríguez-Uría

Persistencia del resultado contable y sus componentes: implicaciones de la medida de ajustes por devengo
Raúl Iñiguez Sánchez y Francisco Poveda Fuentes

Wage Inequality and Globalisation: What can we Learn from the Past? A General Equilibrium Approach
Concha Betrán, Javier Ferri and Maria A. Pons

Eficacia de los incentivos fiscales a la inversión en I+D en España en los años noventa
Desiderio Romero Jordán y José Félix Sanz Sanz

Convergencia regional en renta y bienestar en España
Robert Meneu Gaya

Tributación ambiental: Estado de la Cuestión y Experiencia en España
Ana Carrera Poncela

Salient features of dependence in daily us stock market indices
Luis A. Gil-Alana, Juncal Cuñado and Fernando Pérez de Gracia

La educación superior: ¿un gasto o una inversión rentable para el sector público?
Inés P. Murillo y Francisco Pedraja
358/2007 Effects of a reduction of working hours on a model with job creation and job destruction
Emilio Domínguez, Miren Ullibarri y Idoya Zabaleta

359/2007 Stock split size, signaling and earnings management: Evidence from the Spanish market
José Yagüe, J. Carlos Gómez-Sala and Francisco Poveda-Fuentes

360/2007 Modelización de las expectativas y estrategias de inversión en mercados de derivados
Begoña Font-Belaire

361/2008 Trade in capital goods during the golden age, 1953-1973
Mª Teresa Sanchis and Antonio Cubel

362/2008 El capital económico por riesgo operacional: una aplicación del modelo de distribución de pérdidas
Enrique José Jiménez Rodríguez y José Manuel Feria Domínguez

363/2008 The drivers of effectiveness in competition policy
Joan-Ramon Borrell and Juan-Luis Jiménez

364/2008 Corporate governance structure and board of directors remuneration policies: evidence from Spain
Carlos Fernández Méndez, Rubén Arrondo García and Enrique Fernández Rodríguez

365/2008 Beyond the disciplinary role of governance: how boards and donors add value to Spanish foundations
Pablo De Andrés Alonso, Valentín Azofra Palenzuela y M. Elena Romero Merino

366/2008 Complejidad y perfeccionamiento contractual para la contención del oportunismo en los acuerdos de franquicia
Vanesa Solís Rodríguez y Manuel González Díaz

367/2008 Inestabilidad y convergencia entre las regiones europeas
Jesús Mur, Fernando López y Ana Angulo

368/2008 Análisis espacial del cierre de explotaciones agrarias
Ana Aldanondo Ochoa, Carmen Almansa Sáez y Valero Casanovas Oliva

369/2008 Cross-Country Efficiency Comparison between Italian and Spanish Public Universities in the period 2000-2005
Tommaso Agasisti and Carmen Pérez Esparrells

370/2008 El desarrollo de la sociedad de la información en España: un análisis por comunidades autónomas
María Concepción García Jiménez y José Luis Gómez Barroso

371/2008 El medioambiente y los objetivos de fabricación: un análisis de los modelos estratégicos para su consecución
Lucía Avella Camarero, Esteban Fernández Sánchez y Daniel Vázquez-Bustelo

372/2008 Influence of bank concentration and institutions on capital structure: New international evidence
Víctor M. González and Francisco González

373/2008 Generalización del concepto de equilibrio en juegos de competición política
Mª Dolores López González y Javier Rodrigo Hitos

374/2008 Smooth Transition from Fixed Effects to Mixed Effects Models in Multi-level regression Models
Maria José Lombardía and Stefan Sperlich
375/2008 A Revenue-Neutral Tax Reform to Increase Demand for Public Transport Services
Carlos Pestana Barros and Juan Prieto-Rodriguez

376/2008 Measurement of intra-distribution dynamics: An application of different approaches to the European regions
Adolfo Maza, María Hierro and José Villaverde

377/2008 Migración interna de extranjeros y ¿nueva fase en la convergencia?
María Hierro y Adolfo Maza

378/2008 Efectos de la Reforma del Sector Eléctrico: Modelización Teórica y Experiencia Internacional
Ciro Eduardo Bazán Navarro

379/2008 A Non-Parametric Independence Test Using Permutation Entropy
Mariano Matilla-García and Manuel Ruiz Marín

380/2008 Testing for the General Fractional Unit Root Hypothesis in the Time Domain
Uwe Hassler, Paulo M.M. Rodrigues and Antonio Rubia

381/2008 Multivariate gram-charlier densities
Esther B. Del Brio, Trino-Manuel Ñíguez and Javier Perote

382/2008 Analyzing Semiparametrically the Trends in the Gender Pay Gap - The Example of Spain
Ignacio Moral-Arce, Stefan Sperlich, Ana I. Fernández-Sainz and Maria J. Roca

383/2008 A Cost-Benefit Analysis of a Two-Sided Card Market
Santiago Carbó Valverde, David B. Humphrey, José Manuel Liñares Zegarra and Francisco Rodríguez Fernandez

384/2008 A Fuzzy Bicriteria Approach for Journal Deselection in a Hospital Library
M. L. López-Avello, M. V. Rodriguez-Uría, B. Pérez-Gladish, A. Bilbao-Terol, M. Arenas-Parra

385/2008 Valoración de las grandes corporaciones farmaceúticas, a través del análisis de sus principales intangibles, con el método de opciones reales
Gracia Rubio Martín y Prosper Lamothe Fernández

386/2008 El marketing interno como impulsor de las habilidades comerciales de las pymes españolas: efectos en los resultados empresariales
Mª Leticia Santos Vijande, Mª José Sanzo Pérez, Nuria García Rodríguez y Juan A. Trespalacios Gutiérrez

387/2008 Understanding Warrants Pricing: A case study of the financial market in Spain
David Abad y Belén Nieto

388/2008 Aglomeración espacial, Potencial de Mercado y Geografía Económica: Una revisión de la literatura
Jesús López-Rodríguez y J. Andrés Faíña

389/2008 An empirical assessment of the impact of switching costs and first mover advantages on firm performance
Jaime Gómez, Juan Pablo Maicas

390/2008 Tender offers in Spain: testing the wave
Ana R. Martínez-Cañete y Inés Pérez-Soba Aguilar
La integración del mercado español a finales del siglo XIX: los precios del trigo entre 1891 y 1905
Mariano Matilla García, Pedro Pérez Pascual y Basilio Sanz Carnero

Cuando el tamaño importa: estudio sobre la influencia de los sujetos políticos en la balanza de bienes y servicios
Alfonso Echazarra de Gregorio

Una visión cooperativa de las medidas ante el posible daño ambiental de la desalación
Borja Montaño Sanz

Efectos externos del endeudamiento sobre la calificación crediticia de las Comunidades Autónomas
Andrés Leal Marcos y Julio López Laborda

Technical efficiency and productivity changes in Spanish airports: A parametric distance functions approach
Beatriz Tovar & Roberto Rendeiro Martín-Cejas

Network analysis of exchange data: Interdependence drives crisis contagion
David Matesanz Gómez & Guillermo J. Ortega

Explaining the performance of Spanish privatised firms: a panel data approach
Laura Cabeza García and Silvia Gomez Anson

Technological capabilities and the decision to outsource R&D services
Andrea Martínez-Noya and Esteban García-Canal

Hybrid Risk Adjustment for Pharmaceutical Benefits
Manuel García-Goñi, Pere Ibern & José María Inoriza

The Team Consensus–Performance Relationship and the Moderating Role of Team Diversity
José Henrique Dieguez, Javier González-Benito and Jesús Galende

The institutional determinants of CO₂ emissions: A computational modelling approach using Artificial Neural Networks and Genetic Programming
Marcos Álvarez-Díaz, Gonzalo Caballero Miguez and Mario Solino

Alternative Approaches to Include Exogenous Variables in DEA Measures: A Comparison Using Monte Carlo
José Manuel Cordero-Ferrera, Francisco Pedraja-Chaparro and Daniel Santín-González

Efecto diferencial del capital humano en el crecimiento económico andaluz entre 1985 y 2004: comparación con el resto de España
Mª del Pópulo Pablo-Romero Gil-Delgado y Mª de la Palma Gómez-Calero Valdés

Análisis de fusiones, variaciones conjeturales y la falacia del estimator en diferencias
Juan Luis Jiménez y Jordi Perdiguero

Política fiscal en la uem: ¿basta con los estabilizadores automáticos?
Jorge Uxó González y Mª Jesús Arroyo Fernández

Papel de la orientación emprendedora y la orientación al mercado en el éxito de las empresas
Óscar González-Benito, Javier González-Benito y Pablo A. Muñoz-Gallego

La presión fiscal por impuesto sobre sociedades en la unión europea
Elena Fernández Rodríguez, Antonio Martínez Arias y Santiago Álvarez García
The environment as a determinant factor of the purchasing and supply strategy: an empirical analysis
Dr. Javier González-Benito y MS Duilio Reis da Rocha

Cooperation for innovation: the impact on innovatory effort
Gloria Sánchez González and Liliana Herrera

Spanish post-earnings announcement drift and behavioral finance models
Carlos Forner and Sonia Sanabria

Decision taking with external pressure: evidence on football manager dismissals in argentina and their consequences
Ramón Flores, David Forrest and Juan de Dios Tena

Comercio agrario latinoamericano, 1963-2000: aplicación de la ecuación gravitacional para flujos desagregados de comercio
Raúl Serrano y Vicente Pinilla

Voter heuristics in Spain: a descriptive approach elector decision
José Luis Sáez Lozano and Antonio M. Jaime Castillo

Análisis del efecto área de salud de residencia sobre la utilización y acceso a los servicios sanitarios en la Comunidad Autónoma Canaria
Ignacio Abásolo Alessón, Lidia García Pérez, Raquel Aguiar Ibáñez y Asier Amador Robayna

Impact on competitive balance from allowing foreign players in a sports league: an analytical model and an empirical test
Ramón Flores, David Forrest & Juan de Dios Tena

Organizational innovation and productivity growth: Assessing the impact of outsourcing on firm performance
Alberto López

Value Efficiency Analysis of Health Systems
Eduardo González, Ana Cárceba & Juan Ventura

Equidad en la utilización de servicios sanitarios públicos por comunidades autónomas en España: un análisis multinivel
Ignacio Abásolo, Jaime Pinilla, Miguel Negrín, Raquel Aguiar y Lidia García

Piedras en el camino hacia Bolonia: efectos de la implantación del EEES sobre los resultados académicos
Carmen Florido, Juan Luis Jiménez e Isabel Santana

The welfare effects of the allocation of airlines to different terminals
M. Pilar Socorro and Ofelia Betancor

How bank capital buffers vary across countries. The influence of cost of deposits, market power and bank regulation
Ana Rosa Fonseca and Francisco González

Analysing health limitations in spain: an empirical approach based on the european community household panel
Marta Pascual and David Cantarero
Regional productivity variation and the impact of public capital stock: an analysis with spatial interaction, with reference to Spain
Miguel Gómez-Antonio and Bernard Fingleton

Average effect of training programs on the time needed to find a job. The case of the training schools program in the south of Spain (Seville, 1997-1999).
José Manuel Cansino Muñoz-Repiso and Antonio Sánchez Braza

Medición de la eficiencia y cambio en la productividad de las empresas distribuidoras de electricidad en Perú después de las reformas
Raúl Pérez-Reyes y Beatriz Tovar

Acerando posturas sobre el descuento ambiental: sondeo Delphi a expertos en el ámbito internacional
Carmen Almansa Sáez y José Miguel Martínez Paz

Determinants of abnormal liquidity after rating actions in the Corporate Debt Market
Pilar Abad, Antonio Díaz and M. Dolores Robles

Export led-growth and balance of payments constrained. New formalization applied to Cuban commercial regimes since 1960
David Matesanz Gómez, Guadalupe Fugarolas Álvarez-Ude and Isís Mañalich Gálvez

La deuda implícita y el desequilibrio financiero-actuarial de un sistema de pensiones. El caso del régimen general de la seguridad social en España
José Enrique Devesa Carpio y Mar Devesa Carpio

Efecos de la descentralización fiscal sobre el precio de los carburantes en España
Desiderio Romero Jordán, Marta Jorge García-Inés y Santiago Álvarez García

Euro, firm size and export behavior
Silviano Esteve-Pérez, Salvador Gil-Pareja, Rafael Llorca-Vivero and José Antonio Martínez-Serrano

Does social spending increase support for free trade in advanced democracies?
Ismael Sanz, Ferran Martínez i Coma and Federico Steinberg

Potencial de Mercado y Estructura Espacial de Salarios: El Caso de Colombia
Jesús López-Rodríguez y María Cecilia Acevedo

Persistence in Some Energy Futures Markets
Juncal Cunado, Luis A. Gil-Alana and Fernando Pérez de Gracia

La inserción financiera externa de la economía francesa: inversores institucionales y nueva gestión empresarial
Ignacio Álvarez Peralta

¿Flexibilidad o rigidez salarial en España?: un análisis a escala regional
Ignacio Moral Arce y Adolfo Maza Fernández

Intangible relationship-specific investments and the performance of r&d outsourcing agreements
Andrea Martínez-Noya, Esteban García-Canal & Mauro F. Guillén

Friendly or Controlling Boards?
Pablo de Andrés Alonso & Juan Antonio Rodríguez Sanz
La sociedad Trenor y Cía. (1838-1926): un modelo de negocio industrial en la España del siglo XIX
Amparo Ruiz Llopis

Continental bias in trade
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez Serrano

Determining operational capital at risk: an empirical application to the retail banking
Enrique José Jiménez-Rodriguez, José Manuel Feria-Dominguez & José Luis Martín-Marín

Costes de mitigación y escenarios post-kyoto en España: un análisis de equilibrio general para España
Mikel González Ruiz de Eguino

Las revistas españolas de economía en las bibliotecas universitarias: ranking, valoración del indicador y del sistema
Valentín Edo Hernández

Convergencia económica en España y coordinación de políticas económicas. un estudio basado en la estructura productiva de las CC.AA.
Ana Cristina Mingorance Arnáiz

Instrumentos de mercado para reducir emisiones de co2: un análisis de equilibrio general para España
Mikel González Ruiz de Eguino

El comercio intra e inter-regional del sector Turismo en España
Carlos Llano y Tamara de la Mata

Efectos del incremento del precio del petróleo en la economía española: Análisis de cointegración y de la política monetaria mediante reglas de Taylor
Fernando Hernández Martínez

Bologna Process and Expenditure on Higher Education: A Convergence Analysis of the EU-15
T. Agasisti, C. Pérez Esparrells, G. Catalano & S. Morales

Global Economy Dynamics? Panel Data Approach to Spillover Effects
Gregory Daco, Fernando Hernández Martínez & Li-Wu Hsu

Pricing levered warrants with dilution using observable variables
Isabel Abínzano & Javier F. Navas

Information technologies and financial performance: The effect of technology diffusion among competitors
Lucio Fuentelsaz, Jaime Gómez & Sergio Palomas

A Detailed Comparison of Value at Risk in International Stock Exchanges
Pilar Abad & Sonia Benito

Understanding offshoring: has Spain been an offshoring location in the nineties?
Belén González-Díaz & Rosario Gandoy

Outsourcing decision, product innovation and the spatial dimension: Evidence from the Spanish footwear industry
José Antonio Belso-Martínez
Does playing several competitions influence a team’s league performance? Evidence from Spanish professional football
Andrés J. Picazo-Tadeo & Francisco González-Gómez

Does accessibility affect retail prices and competition? An empirical application
Juan Luis Jiménez and Jordi Perdiguero

Cash conversion cycle in smes
Sonia Baños-Caballero, Pedro J. García-Teruel and Pedro Martínez-Solano

Un estudio sobre el perfil de hogares endeudados y sobreendeudados: el caso de los hogares vascos
Alazne Mujika Alberdi, Iñaki García Arrizabalaga y Juan José Gibaja Martíns

Imposing monotonicity on outputs in parametric distance function estimations: with an application to the spanish educational production
Sergio Perelman and Daniel Santín

Key issues when using tax data for concentration analysis: an application to the Spanish wealth tax
José Mª Durán-Cabrè and Alejandro Esteller-Moré

¿Se está rompiendo el mercado español? Una aplicación del enfoque de feldstein –horioka
Saúl De Vicente Queijeiro, José Luis Pérez Rivero y María Rosalia Vicente Cuervo

Financial condition, cost efficiency and the quality of local public services
Manuel A. Muñiz & José L. Zafra

Including non-cognitive outputs in a multidimensional evaluation of education production: an international comparison
Marián García Valiñas & Manuel Antonio Muñiz Pérez

A political look into budget deficits. The role of minority governments and oppositions
Albert Falcó-Gimeno & Ignacio Jurado

La simulación del cuadro de mando integral. Una herramienta de aprendizaje en la materia de contabilidad de gestión
Elena Urquía Grande, Clara Isabel Muñoz Colomina y Elisa Isabel Cano Montero

Análisis histórico de la importancia de la industria de la desalinización en España
Borja Montaño Sanz

The dynamics of trade and innovation: a joint approach
Silviano Esteve-Pérez & Diego Rodríguez

Measuring international reference-cycles
Sonia de Lucas Santos, Inmaculada Álvarez Ayuso & Mª Jesús Delgado Rodríguez

Measuring quality of life in Spanish municipalities
Eduardo González Fidalgo, Ana Cárcaba García, Juan Ventura Victoria & Jesús García García

¿Cómo se valoran las acciones españolas: en el mercado de capitales doméstico o en el europeo?
Begoña Font Belaire y Alfredo Juan Grau Grau

Patterns of e-commerce adoption and intensity. evidence for the european union-27
María Rosalia Vicente & Ana Jesús López
On measuring the effect of demand uncertainty on costs: an application to port terminals  
Ana Rodríguez-Álvarez, Beatriz Tovar & Alan Wall

Order of market entry, market and technological evolution and firm competitive performance  
Jaime Gómez, Gianvito Lanzolla & Juan Pablo Maicas

La Unión Económica y Monetaria Europea en el proceso exportador de Castilla y León (1993-2007): un análisis de datos de panel  
Almudena Martínez Campillo y Mª del Pilar Sierra Fernández

Do process innovations boost SMEs productivity growth?  
Juan A. Mañez, María E. Rochina Barrachina, Amparo Sanchis Llopis & Juan A. Sanchis Llopis

Incertidumbre externa y elección del modo de entrada en el marco de la inversión directa en el exterior  
Cristina López Duarte y Marta Mª Vidal Suárez

Testing for structural breaks in factor loadings: an application to international business cycle  
José Luis Cendejas Bueno, Sonia de Lucas Santos, Inmaculada Álvarez Ayuso & Mª Jesús Delgado Rodríguez

¿Esconde la rigidez de precios la existencia de colusión? El caso del mercado de carburantes en las Islas Canarias  
Juan Luis Jiménez y Jordi Perdiguero

The poni test with structural breaks  
Antonio Aznar & María-Isabel Ayuda

Accuracy and reliability of Spanish regional accounts (CRE-95)  
Verónica Cañal Fernández

Estimating regional variations of R&D effects on productivity growth by entropy econometrics  
Esteban Fernández-Vázquez y Fernando Rubiera-Morollón

Why do local governments privatize the provision of water services? Empirical evidence from Spain  
Francisco González-Gómez, Andrés J. Picazo-Tadeo & Jorge Guardiola

Assessing the regional digital divide across the European Union-27  
María Rosalía Vicente & Ana Jesús López

Measuring educational efficiency and its determinants in Spain with parametric distance functions  
José Manuel Cordero Ferrera, Eva Crespo Cebada & Daniel Santín González

Spatial analysis of public employment services in the Spanish provinces  
Patricia Suárez Cano & Matías Mayor Fernández

Trade effects of continental and intercontinental preferential trade agreements  
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez-Serrano

Testing the accuracy of DEA for measuring efficiency in education under endogeneity  
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez-Serrano

Measuring efficiency in primary health care: the effect of exogenous variables on results  
José Manuel Cordero Ferrera, Eva Crespo Cebada & Luis R. Murillo Zamorano
489/2009 Capital structure determinants in growth firms accessing venture funding
Marina Balboa, José Martí & Álvaro Tresierra

490/2009 Determinants of debt maturity structure across firm size
Víctor M. González

491/2009 Análisis del efecto de la aplicación de las NIIF en la valoración de las salidas a bolsa
Susana Álvarez Otero y Eduardo Rodríguez Enríquez

492/2009 An analysis of urban size and territorial location effects on employment probabilities: the spanish case
Ana Viñuela-Jiménez, Fernando Rubiera-Morollón & Begoña Cueto

493/2010 Determinantes de la estructura de los consejos de administración en España
Isabel Acero Fraile y Nuria Alcalde Fradejas

494/2010 Performance and completeness in repeated inter-firm relationships: the case of franchising
Vanesa Solis-Rodriguez & Manuel Gonzalez-Diaz

495/2010 A Revenue-Based Frontier Measure of Banking Competition
Santiago Carbó, David Humphrey & Francisco Rodríguez

496/2010 Categorical segregation in social networks
Antoni Rubí-Barceló

497/2010 Beneficios ambientales no comerciales de la directiva marco del agua en condiciones de escasez: análisis económico para el Guadalquivir
Julia Martín-Ortega, Giacomo Giannoccaro y Julio Berbel Vecino

498/2010 Monetary integration and risk diversification in eu-15 sovereign debt markets
Juncal Cuñado & Marta Gómez-Puig

José Antonio Carrasco Gallego

500/2010 The role of learning in firm R&D persistence
Juan A. Mañez, María E. Rochina-Barrachina, Amparo Sanchis-Llopis & Juan A. Sanchis-Llopis

501/2010 Is venture capital more than just money?
Marina Balboa, José Martí & Nina Zieling

502/2010 On the effects of supply strategy on business performance: do the relationships among generic competitive objectives matter?
Javier González-Benito

503/2010 Corporate cash holding and firm value
Cristina Martínez-Sola, Pedro J. García-Teruel & Pedro Martínez-Solano

504/2010 El impuesto de flujos de caja de sociedades: una propuesta de base imponible y su aproximación contable en España
Lourdes Jerez Barroso y Joaquín Texeira Quirós

505/2010 The effect of technological, commercial and human resources on the use of new technology
Jaime Gómez & Pilar Vargas
506/2010 ¿Cómo ha afectado la fiscalidad a la rentabilidad de la inversión en vivienda en España?
Un análisis para el periodo 1996 y 2007
Jorge Onrubia Fernández y María del Carmen Rodado Ruiz

507/2010 Modelización de flujos en el análisis input-output a partir de la teoría de redes
Ana Salomé García Muñiz

508/2010 Export-led-growth hypothesis revisited. a balance of payments approach for Argentina, Brazil, Chile and Mexico
David Matesanz Gómez & Guadalupe Fugarolas Álvarez-Ude

509/2010 Realised hedge ratio properties, performance and implications for risk management: evidence from the spanish ibex 35 spot and futures markets
David G McMillan & Raquel Quiroga García

510/2010 Do we sack the manager... or is it better not to? Evidence from Spanish professional football
Francisco González-Gómez, Andrés J. Picazo-Tadeo & Miguel Á. García-Rubio

511/2010 Have Spanish port sector reforms during the last two decades been successful? A cost frontier approach
Ana Rodriguez-Álvarez & Beatriz Tovar

512/2010 Size & Regional Distribution of Financial Behavior Patterns in Spain
Juan Antonio Maroto Acín, Pablo García Estévez & Salvador Roji Ferrari

513/2010 The impact of public reforms on the productivity of the Spanish ports: a parametric distance function approach
Ramón Núñez-Sánchez & Pablo Coto-Millán

514/2010 Trade policy versus institutional trade barriers: an application using “good old” ols
Laura Márquez-Ramos, Inmaculada Martínez-Zarzoso & Celestino Suárez-Burguet