

Solleder, Olga

Working Paper

Panel Export Taxes (PET) dataset: New data on export tax rates

Graduate Institute of International and Development Studies Working Paper, No. 07/2013

Provided in Cooperation with:

International Economics Section, The Graduate Institute of International and Development Studies

Suggested Citation: Solleder, Olga (2013) : Panel Export Taxes (PET) dataset: New data on export tax rates, Graduate Institute of International and Development Studies Working Paper, No. 07/2013, Graduate Institute of International and Development Studies, Geneva

This Version is available at:

<https://hdl.handle.net/10419/77398>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Graduate Institute of
International and Development Studies Working Paper No:
07/2013

Panel Export Taxes (PET) Dataset: New Data on Export Tax Rates

Olga Solleder

Graduate Institute of International Studies

Abstract

This paper describes a newly collected dataset on export tax rates, which provides comprehensive coverage for 20 countries, 2 time periods and all products at HS6 level. Export tax rates are based on national government documentation, including preferential provisions for partner countries. The data are organized in a harmonized and comparable format, including ad-valorem equivalents of specific taxes. The dataset can contribute to the empirical analysis of export taxes – an increasingly applied trade policy instrument, which merits further attention from academia and policy makers alike. Furthermore, the paper contains literature review and stylized facts highlighting various aspects of export taxes.

© The Authors.

All rights reserved. No part of this paper may be reproduced without the permission of the authors.

PANEL EXPORT TAXES (PET) DATASET: NEW DATA ON EXPORT TAX RATES

Olga Solleder*

This draft: April 2013

Abstract: This paper describes a newly collected dataset on export tax rates, which provides comprehensive coverage for 20 countries, 2 time periods and all products at HS6 level. Export tax rates are based on national government documentation, including preferential provisions for partner countries. The data are organized in a harmonized and comparable format, including *ad-valorem* equivalents of specific taxes. The dataset can contribute to the empirical analysis of export taxes – an increasingly applied trade policy instrument, which merits further attention from academia and policy makers alike. Furthermore, the paper contains literature review and stylized facts highlighting various aspects of export taxes.

JEL codes: C81, F13, F42, H21, Y10.

Keywords: Export taxes, trade taxes, taxation of exports, export levies, export duties, export tax rates, export tax data, export tax agreements, export restrictions

* Graduate Institute of International and Development Studies, Geneva, olga.solleder@graduateinstitute.ch

I gratefully acknowledge the helpful guidance of Professor Richard Baldwin. I thank staff of the national authorities who kindly responded to my requests for information. Finally, I am extremely grateful to my friends and colleagues who have helped me to locate and translate information from their home countries. They are too numerous to be listed here individually but without their support this work would not have been possible.

The new Panel Export Taxes (PET) dataset is available at <http://olga.solleder.org/export-taxes>.

“This dependence upon foreign supplies is, of course, as old as international trade. But in recent years its results have been intensified by two tendencies: one, the rapid growth of this economic interdependence, as a phase of modern industrial development; the other, the increased obstacles placed in the way of satisfying the requirements of the importing countries.” Lynn Ramsay Edminster (1930), p.89.

“[...] the use of export taxes was fraught with exceedingly dangerous possibilities of friction.” Gorton James (1924), p.56.

1. Introduction

1.1. Background

The political and economic importance of export taxes has not decreased since the beginning of the 20th century. After the two waves of globalisation countries are ever more interdependent; developing countries play a significant role in global value chains both as suppliers and as importers; and each economic crisis brings incentives to resort to protectionist policies. The importance of export taxes has been reflected in a growing number of international agreements; yet it did not lead to more empirical research, mostly due to a lack of data. This work aims at remedying this shortcoming by constructing and making available a harmonized international dataset on export tax rate at product level with comprehensive coverage of products and preferential tax rates over time.

The new dataset can contribute to both academic and policy research. Transparency allows policy makers to improve understanding of market conditions and to inform policy design. The information on export taxes is especially relevant in the context of trade agreements and WTO accessions. Higher scrutiny can also prevent beggar-thy-neighbour policies vis-à-vis partner countries and inform discussion on potential spillover effects of export taxes on trading partners. Furthermore, the data can provide more transparency regarding the re-distributional effects of export taxes within applying nations, consequences of tax policy reforms, and a better balance between various policy objectives.

From research perspective, a harmonized and comprehensive dataset on export taxes can stimulate empirical analysis and contribute to stylized facts motivating trade theories. The database can help to understand why countries resort to export taxes and how these taxes are designed and employed. The implications for individual countries (tax-imposing nations as well as their trading partners) and for the multilateral trading system in general can also be more easily investigated. Furthermore, the research on export taxes can contribute, among other areas, to a better understanding of food crises,

trade in natural resources and polluting goods, strategic policies of large nations, and motivation for forming trade agreements.

The rest of the paper is structured as follows. The remainder of the section reviews literature, while [section 2](#) describes raw data and existing international data collection initiatives. [Section 3](#) describes the methodology for collecting the raw data and constructing the PET dataset, followed by the summary statistics and stylized facts presented in [Section 4](#). [Section 5](#) concludes.

1.2. Literature review

The primary purpose of this section is to highlight the extent of issues and the scope of research related to export taxes. It starts with a brief overview of the history of export duties and their policy objectives, followed by the current use of export taxes and their coverage by the GATT/WTO law and trade agreements. The section then brings together dispersed contributions on the impact of export taxes evaluated using CGEMs, gravity models and case studies. The discussion includes literature on optimal export taxes, including tax impact in the presence of externalities and imperfect competition.

1.2.1. History and policy objectives

Until the 19th century, export taxes were extensively used in Europe as a source of revenue and as a mean to keep inputs for domestic production, especially in countries adhering to mercantilist policies. England, for example, started to tax exports of raw wool hides in 1275; covering 212 products by 1660 ([Goode, Lent, and Ojha 1966](#)). The Dutch has imposed export tax, but followed a different approach by imposing a uniform 1% export tax which remained largely unchanged throughout the 1600's and 1700's ([Way 2012](#)).¹ African slave trade was also subject to export taxes ([Klein 2010](#)).

With the liberalization of trade in the 19th century the application of export taxes decreased in Europe, but extended in the colonial areas of Asia and Africa and continued in Latin America. In Asia and Africa export taxes were designed to exploit the monopolies of colonies on certain materials, to favour countries controlling colonies and to collect revenues. In Latin America, the primary objective of export taxes was revenue, and to a lesser extent local production and control of the foreign capital ([Goode, Lent, and Ojha 1966](#)).²

¹ [Way \(2012\)](#) offers other examples of export taxes applied by the European countries in the historic context.

² The impact of export taxes applied in the 19th century can, together with other factors, have long-lasting consequences. [Musacchio, Fritscher, and Viarengo \(2013\)](#) find that positive trade shocks increased spending on education and literacy rates. The authors used the differences in sub-national regional data from Brazil during the period 1889-1930 when the regions had a relative financial autonomy to collect export taxes and spend on public goods.

A different approach was taken by the United States owing to the political and economic context after the Civil War. The United States have explicitly forbidden the application of any export duties¹. The provision was put in place because Southern states feared that national tax on raw materials would be mainly paid by the south², while the northern states tried to prevent a possibility of southern states taxing them for the materials they drew from the south. Both parties recognized that export taxes could create a high possibility of friction and preferred eliminating it (James 1924).

After the World War I, new export controls have been imposed by countries with large concentration of commodities. Countries dependant on the supply of essential raw materials, such as Italy, Belgium and Japan, urged the League of Nations to search for a fair apportionment of the resources (Viner 1925). Edminster (1930) developed principles for an international agreement regulating export controls. No agreement had, however, been concluded by the League of Nations or its successor, the United Nations.

In 1960th export taxes were applied mostly by developing countries with predominant objective of revenue generation (Goode, Lent, and Ojha 1966). Authors list 45 countries applying export taxes. In 11 countries the share of export taxes in total revenue exceeds 10%, with the highest share, more than 40%, reported for Uganda (the figure includes marketing board revenues). At the time, countries usually applied selective taxes on raw materials enjoying relatively strong market power to exploit ToT, while in some cases export duties were applied to all exports with a flat rate of 1 to 3% (up to 10% in a few cases) to generate revenues.

In the first decade of the 21st century export taxes show a very different picture. First, the international economic context has changed compared to the 1960th with countries becoming more interdependent and developing countries playing a more prominent role in the world trade. Second, many more countries impose export taxes (a list of 111 jurisdiction applying export taxes is provided in Table 7 of the Annex), most of them are developing countries. While a number of countries still apply a small flat tax to all exported products or stable-rate taxes on selected raw commodities with market power, other countries use export taxes intensively, frequently changing their rates and product coverage. These active users of export taxes are generally large developing countries, for example Argentina, Brazil, China, India and Russian Federation.

¹ Paragraph 5 of section 9, Article I of the Constitution, which says: "No tax or duty shall be laid on articles exported from any state." (James 1924)

² Southern states produced around 80% of the world cotton before the Civil War. Irwin (2003) estimated that the price elasticity of demand for the US cotton was about 21.7, and the optimal tax of about 50% would have raised the US welfare by about 0.3 of US GDP or 1% of the South's GDP.

Finally, stated policy objectives for the application of export taxes now go beyond revenue collection and exploiting ToT. Frequently cited policy objectives currently include protection of environment, food security, and development¹. In addition to raw materials, countries tax a wider scope of products for example agro-food items. Further details are presented in [section 4](#) which provides stylized facts and summary statistics based on a new product level dataset on export taxes (PET dataset).

1.2.2. GATT/WTO

GATT has an asymmetric treatment of exports and imports. The disciplines on the export side are more lax, for example export taxes are a legitimate instrument, and until recently Members were not expected to take any commitment on the maximum rates of export taxes as GATT Article II on Schedules of Concessions covers only import duties and charges in connection with importation.

Newly acceded Members (China, Mongolia, Saudi Arabia, Ukraine, Vietnam and Russia) have been, however, asked to undertake commitments to eliminate at least some export taxes and bound their rates akin to import tariff bindings. For example China's WTO Accession Protocol includes a commitment to eliminate all export duties with the exception of 84 listed tariff lines (see [Table 1](#) in [section 2](#) for bound rates of selected products). Subsequently, the United States, European Union and Mexico challenged Chinese export taxes applied to the goods not specified under the exemptions and won the dispute ([WTO Dispute Settlement 2012](#)). Mongolia asked for a temporary waiver of its accession commitment to eliminate export taxes and was granted it ([WTO 2012](#)). The waiver was required to preserve the cashmere processing industry in Mongolia which played a critical economic and cultural role, and which suffered from a lack of raw cashmere that was almost entirely sold abroad in the absence of export duties.

[Karapinar \(2010\)](#) questions whether a lack of discipline on export restrictions presents a 'regulatory deficiency' or an 'unintended policy space'. The author concludes that reforms of export restrictions may be necessary to correct market failures especially where it concerns environmental sustainability and inter-generational equity. With regard to export taxes, however, the author finds that stricter WTO regulations may not only be politically unfeasible but also undesirable, as export taxes represent an effective tool for protecting exhaustible resources, and for promoting value addition in resource-rich developing countries.

¹ WTO Trade Policy Reviews (TPRs) provide information on the policy objectives of export taxes. Under developmental objectives, government countries often refer to export taxes aiming at trade diversification and upgrade along the value chain, ensuring the supply of inputs to domestic processing capacities, as well as reducing inflationary pressure and insulating domestic prices from the world price volatility. Other objective include redistribution of windfall profits and gains from currency devaluation; offsetting of import tariff escalation; preventing smuggling, complementing diminishing import tariff revenues; as well as redistributing welfare among industries, consumers and producers.

Historic and economic context at the time of GATT creation can shed some light on the asymmetric treatment of export restrictions. The major actors were developed countries who practically did not use export taxes, so it seemed a less pressing issue. Furthermore, at the time export-sector liberalisation negotiations were not anticipated, so the issues on non-tariff measures that were included on the import side were not symmetrically included on the export side (Staiger 2012).

The omission of export taxes was not unintended. Countries realized the economic impact of export taxes and potential for trade frictions. During the negotiations that resulted in a creation of GATT, the US put forward a proposal for a prohibition of export taxes¹. Furthermore there have been earlier proposals to other international bodies, mainly from densely populated resource-poor economies (Viner 1925). Thus, the importance of export taxes was clear for the negotiating parties, but the issue seemed to have a lower priority than other aspects of GATT negotiations.

Currently, a number of WTO Members argue for a stricter discipline on export taxes. As before, the agenda is driven by the resource-poor developed countries. The European Communities are actively seeking to introduce commitments by all WTO members to bind and reduce export taxes. The EC have tabled a negotiating proposal under the current NAMA negotiations on non-tariff barriers to trade which aims at preventing the use of export taxes for industrial or trade policy purposes (EC 2006). Japan has also submitted several proposals. While the EC proposal aims at reduction, elimination and at least restriction of export taxes, the Japanese proposal seeks to enhance transparency in the application of export restrictions. Countries applying export duties do not lend support to these proposals mainly evoking the developmental objectives of the Doha Round (South Centre 2006).

1.2.3. Discriminatory export taxes

Outside the GATT/WTO, pursue their export tax agendas in the context of regional and bilateral trade agreements. Approaches vary from an elimination of export taxes as for example in the EU Economic Partnership Agreements (EPAs) and the Customs Union of Belarus, Kazakhstan and the Russian Federation, and lower export taxes for partner countries on selected product (ASEAN, SACU) to no provisions on export duties at all (especially in older trade agreements).

The full EU EPA signed by the Caribbean Forum and the interim EPAs signed by many African, Caribbean and Pacific countries seek to ban export restrictions and export taxes, subject to temporary and exceptional circumstances such as critical shortages of foodstuffs, protection of infant industries or protection of the environment. The provisions has been contested by many African trade ministers;

¹ This proposal showed that export taxes were an important policy concern, yet, it was also an easy negotiating card for the US, as export taxes had been forbidden by the US Constitution and were not applied.

for instance, Namibia signed the Southern African Development Community (SADC) interim EPA only under condition that the provision on export taxes was lifted ([ODI 2012](#)).

The export tax provisions in EPA go beyond WTO obligations. [Korinek and Bartos \(2012\)](#) have classified 92 trade agreements into WTO-plus (forbidding export restrictions where the WTO allows them), WTO-minus (allowing export restrictions where the WTO does not) and WTO-equal. They find that out of surveyed RTAs, 64 agreements contain WTO-plus provisions on export taxes and 29 contain WTO-equal provisions.

Discriminatory export taxes (favouring selected importing countries) are in violation of Article I GATT 1994 (MFN) but can be justified under Article XX (general exception) and Article XXI (national security). Furthermore, under Article XXIV export tax preferences are WTO consistent as long as they are granted to countries that share membership in the same trade agreement. Most countries that apply bilateral export taxes do so in the framework of trade agreements. The notable exception is Brazil.

Currently Brazil applies export taxes on three product categories. In case of leather and skins the taxes are levied on all exports, while for cigars and arms and ammunition only exports to selected countries in South and Central America and the Caribbean are affected. Up to 2007, Brazil levied export taxes on tobacco and tobacco substitutes exported to Paraguay and Uruguay, but revoked them after Uruguay had brought a complaint to MERCOSUR Tribunal ([WTO TPR by Secretariat, Brazil, 2009](#)). The anecdotal evidence suggests that high export taxes on tobacco products (150%) exported to neighbouring countries is in place to prevent smuggling of cigarettes back to Brazil to bypass high internal consumption taxes.

Export tax imposing countries can form cartel agreements, e.g. international commodity agreements (ICAs), to collectively exert a higher market power and to stabilize and control the prices of natural resources. ICAs are also viewed as a tool to correct the declining terms of trade of developing countries. Examples of active ICAs include the OPEC and the International Tropical Timber Agreement, while the International Tin Agreement and the International Natural Rubber Agreement were terminated ([WTO 2010](#)). Given that few Sub-Saharan countries have sufficient power to impact ToT¹, [Akiyama and Larson \(1994\)](#) study a possibility of a regional trade policy and conclude that if an export tax is imposed Sub-Saharan Africa as a whole the major benefits can go to producers in other regions such as Asia and Latin America. Furthermore, at the practical level it would have been difficult to equitably distribute the benefits of such a policy.

¹ Except Côte d'Ivoire and Ghana in cocoa, Kenya in tea and Malawi in burley tobacco.

1.2.4. Analyses of export taxes

Trade policy analyses, including that of export taxes, can be based on an *ex-ante* and *ex-post* approach. *Ex-ante* analyses generally imply a use of partial equilibrium or computable general equilibrium (CGE) models. *Ex-post* approaches include gravity models and other econometric estimations, as well as case studies. Most of the studies focus on economic and welfare effects of export taxes and the optimal size of export taxes.

The literature on export taxes using CGE models can be roughly divided into multi-country and single-country studies. In multi-country settings, [Bouët and Laborde \(2010\)](#) focus on the wheat sector to study export taxes in the context of the food crisis. They find that the optimal national response to a positive price shock is to decrease import tariffs in net food importing countries and to increase export tariffs in net food exporting countries, with both policies hurting small net-food importing countries. They estimate that the world price of wheat has increased by 10.8% due to demand shocks, exacerbated up to 16.8% when net wheat exporters apply export taxes. The situation is a vicious cycle when an initial demand shock rising prices is followed by beggar-thy-neighbour policies (optimal at national level) that further increase prices. [Bouet, Estrades, and Laborde \(2012\)](#) study the implementation of differential export tax rates along value chains (decreasing with the value of processing), in particular in the oilseeds chain consisting of seeds, vegetable oils biodiesel¹. They simulate the impact of differential export taxes in a partial equilibrium model of oil seeds and find that both consumers and producers would benefit from elimination of export taxes.

By comparing general equilibrium (GE) and partial equilibrium (PE) models under imperfect competition, [Santis \(2012\)](#) shows that an export tax, optimal in PE, is biased upward in GE settings with free entry. His results for the Turkish economy suggest that the export tax leads to an increase in firm size and a social welfare loss. Using PE and GE frameworks [Yilmaz \(1999\)](#) finds the society attains a higher level of welfare under Nash revenue maximizing taxes than under Nash optimum taxes and warns against the use of Lerner symmetry in the policy-oriented analysis.

In single-country settings, [Waschik and Fraser \(2007\)](#) use a Monash CGE model to estimate optimal export tax on wool for Australia and show the sensitivity of the results to the employed measures of elasticity.² [Kireyev \(2010\)](#) explicitly models export tax for two domestic market structures, perfect

¹ Differential export taxes define relatively high export taxes on raw commodities and relatively low taxes on processed goods; the mechanics is similar to import tariff escalation with the objective of promoting domestic value addition.

² Other examples of modelling export taxes using CGEMs include biofuels in Argentina ([Timilsina, Chisari, and Romero 2013](#)), rice in Thailand ([Warr 2001](#)) and coconut levy in the Philippines ([Warr 2002](#)).

competition and oligopsony, and finds that for the tax imposing country it can be welfare enhancing in both cases. Two models are then calibrated for an illustrative case of Côte d'Ivoire's export of cocoa. These results correspond to predictions by [Deardorff and Rajaraman \(2005\)](#) that suggest that export tax can counter buyers' power in the condition of monopsony or oligopsony.

Most *ex-post* analyses conclude that export taxes reduce trade and increase world prices. A multi-country estimation of trade effects of export taxes based on a structural gravity model indicate that the elasticity of trade quantities to tax is -1.8 on average, rising to -5.5 for extractive sectors; with export taxes playing a role in the rise of world prices ([Solleder 2013](#)). [Latina, Piermartini, and Ruta \(2011\)](#) focus on the application of export taxes (and tariff escalation) with the aim of exploiting ToT effects at the expenses of trading partners and find that in equilibrium trade is insufficiently low as these policies offset each other in a Prisoners' dilemma situation.

A number of studies search for conditions under which export taxes is optimal. [Devarajan et al. \(1996\)](#) conclude that only countries with market power should tax their exports. [Broda, Limão, and Weinstein \(2006\)](#) find empirical evidence that countries use their market power in setting non-cooperative trade policy. [Suzuki \(1978\)](#) shows that an export tax levied on intermediate goods can decrease the welfare of the tax imposing country. [Akiyama \(1992\)](#) warns that in case of the perennial crops a government should give less consideration to the tax's optimality and more to how it affects welfare and long-term production. [Bandyopadhyay and Majumdar \(2004\)](#) investigate export taxes in the presence of multilateral transfers. [Auquier and Caves \(1979\)](#) warn that competition cannot be preserved at home while maintaining monopoly power in export markets. [Flaaten and Schulz \(2010\)](#) demonstrate positive economic and environmental effects of an export tax for renewable resource goods. [Zee \(2007\)](#) searches for an optimal tax in times of trade surpluses and compares the effects of export taxes to the effects of an exchange rate appreciation.

The results of case studies vary by product and country. Econometric estimations by [Hudson and Ethridge \(1999\)](#) suggest that export taxes on cotton introduced by Pakistan to benefit the domestic yarn industry had a negative impact on the growth rate in the cotton sector, while having little or no impact on the yarn sector. [Reid Smith \(2009\)](#) cites case studies of successful industry development in Mongolia (textiles), Indonesia and Canada (wood), as well as for government revenues combatting budget deficit during the transition period in Russia. [Wang, Li, and Zhang \(2010\)](#) question whether export taxes (EVRRET) and export VAT refund applied by China on energy intensive products is a genuine climate policy and suggest a method for introducing an explicit carbon cost into the current EVRRET.

The International Monetary Fund and the World Bank, as part of their structural adjustment programmes attempt to discourage developing countries from using export taxes. One of the reasons for elimination of export taxes is a bias that they create against agriculture (Deese and Reeder 2008). Emran (2005) underscores that such trade policy reforms are hindered by revenue reduction and suggests reducing export taxes and simultaneously increasing productions taxes to the level which would keep the producer price unchanged, especially for products for which taxes cumulatively acts as a net subsidy on domestic consumption. Margaret McMillan (2001) finds empirical evidence that the sustainability of a low tax policy depends on the ratio of sunk costs to total costs, expected future export earnings and the discount factor on the future export revenues.

Mozambique's cashew nuts industry liberalisation in the 1990ies is one of the episodes of export tax removal imposed by the World Bank with the objective of increased income for cashew farmers and more efficient resource allocation. McMillan, Rodrik, and Welch (2002) analyse the situation and point to controversial results of these reforms, with farm gate prices going up while processing plants in urban areas being shut down leaving thousand workers unemployed.

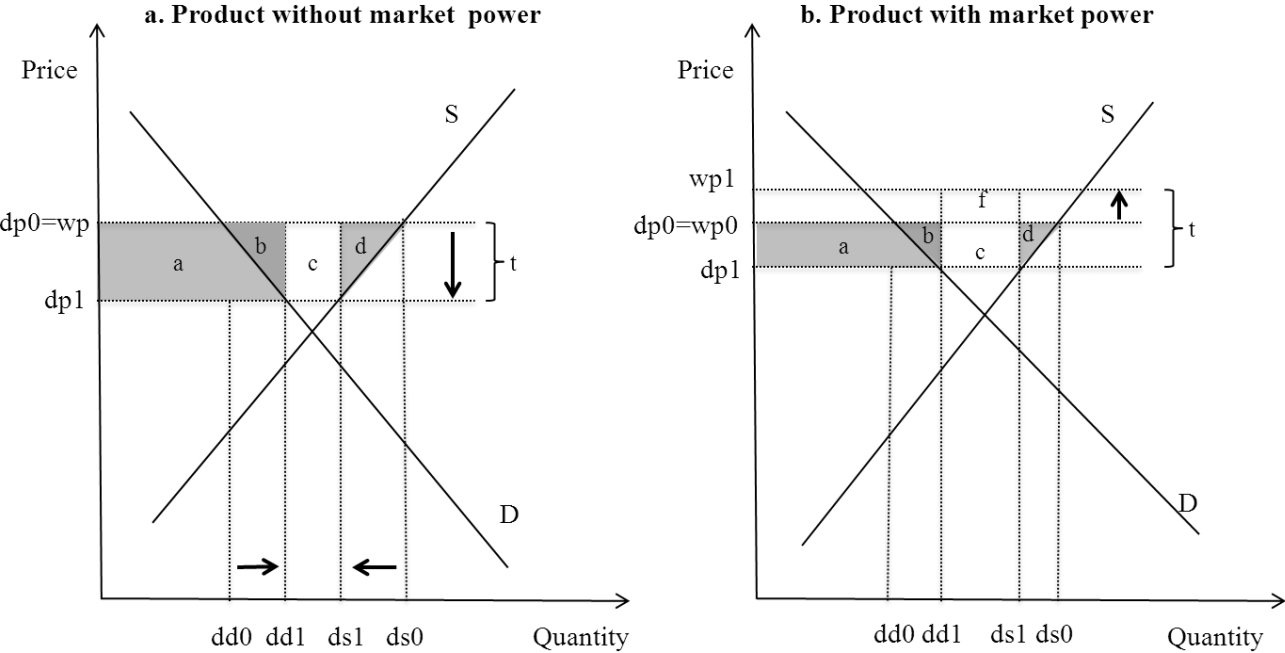
1.3. Export tax mechanics

Multiple effects of export taxes described above can be pinned down to two transmission channels: an interaction between domestic and international markets with terms of trade (ToT) gains for a product with market power, and distribution effects within the country where a wedge between domestic and international price favours downstream producers or consumers of the taxed commodity. These two channels are presented below in a schematic form.

1.3.1. Economic impact of export taxes in partial equilibrium settings

The impact of an export tax in partial equilibrium settings is shown in Figure 1. The left pane illustrates the impact of a tax on a product without market power, while the right pane shows the impact when a product enjoys some power at the world market, when changes in its production at a national level trigger changes in its world price. A product may have market power because its production is geographically concentrated in a few countries or because it faces a low price elasticity of demand and substitution.

Figure 1 Partial equilibrium analysis of an export tax



In the case of a product without market power, the initial level of domestic price (dp_0) is equal to the world price (wp). At this price local consumers buy dd_0 units, while producers supply ds_0 units. Supply is greater than demand ($ds_0 > dd_0$) with the difference being exported ($ds_0 - dd_0$). Upon the imposition of an export tax, producers are forced to reduce their factory price to the level dp_1 , so that the world price after tax remains equal the world price ($wp = dp_1 + t$), as by definition, they do not have market power. The domestic price is lower than the world price. At a lower domestic price, consumers buy more (dd_1) while producers supply less than before tax (ds_1). Export is also reduced ($ds_1 - dd_1$).

Domestic consumers benefit from export tax as they consume more ($dd_1 > dd_0$) at a lower price ($dp_1 > dp_0$), with consumer surplus increased by area (a). Domestic producers lose as they supply less ($ds_1 < ds_0$) at a lower price ($dp_1 < dp_0$), with their surplus reduced by area (a+b+c+d). Public revenues are increased and equal to area (c), or in other words, the units of exports ($ds_1 - dd_1$) multiplied by the world price (wp) and by tax rate. The total domestic welfare is reduced by the deadweight loss denoted by area (b+d). Thus, taxation of a product without market power can make sense only if distributional effects are desirable (policy makers value public revenues or the welfare of consumers more than the welfare of producers), or if public policy benefits of export taxes, such as food security or environmental protection outweigh economic losses.

The impact of export taxes on a product with market power (right pane of **Figure 1**) is different because, by definition, the changes in domestic production of the good affect its world price, creating

a welfare gain through ToT effect. Upon imposition of a tax producers are more willing to sell at home as domestic sales are not taxed. The reduction in exports leads to an increase in the world price as the good has some market power. Producers start supplying more to foreign markets until the moment when they are indifferent between selling an extra unit at home market at the domestic price dp_1 or at foreign markets at the world price wp_1 , that is, when the domestic price is equal to the new world price minus tax ($dp_1=wp_1-t$).

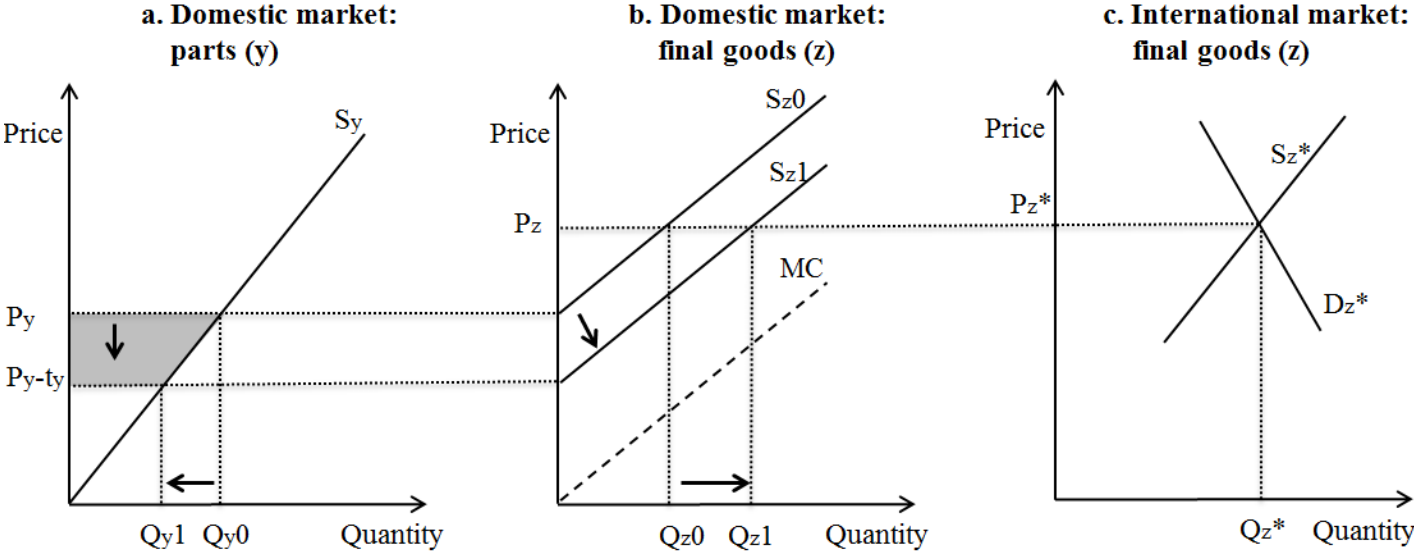
Upon imposition of an export tax, domestic consumers will buy more (dd_1) at a lower price (dp_1), and the consumer surplus is increased by area (a). The direction of the effect is identical to the case of a product without market power but the magnitude can be smaller and in some cases negligible (e.g. when the world demand for the taxed product is price inelastic). Total domestic production is reduced (although to a lesser extent), and the loss in producer surplus is measured by area (a+b+c+d). Public revenues are now represented by the area c+f. This area is larger than area (c) in the previous calculations due to area (f), denoting improvement in national ToT (resulting from an increase of the world price from wp_0 to wp_1). If tax revenues and ToT gains (c+f) exceed the deadweight loss (b+d) than the policy leads to an increase in total domestic welfare (at the expense of importing countries).

Furthermore, there are second order effects on the countries importing taxed commodity. In case where tax changes ToT, importing countries lose for two reasons. On the one hand, their imports are more costly, on the other hand their industries that use the taxed good as inputs are, ceteris paribus, less competitive than industries located in the country imposing export tax. Therefore, in the extreme case, export taxes can induce the relocation of production. If a tax imposing country has tax agreements with other countries specifying lower or zero rate taxes among members of the agreement, the welfare changes in the partner country are similar to the domestic effects. Consumers of the commodity in focus (final buyers or downstream processing industries) will gain because they have access to it tax free while producers will lose due to a tougher competition from abroad.

1.3.2. Distribution impact of export tax across industries of a tax-imposing nation

Imposition of export tax, as any trade policy, has redistributionary consequences. Export tax favours domestic producers from downstream industries that use taxed products as their inputs and domestic consumers of taxed products. Domestic consumers and downstream industries access these products tax free. The argument is schematically presented below (Figure 2).

Figure 2 Parts and final goods market equilibrium



Source: Adapted from Baldwin (2013).

For the sake of the clarity of the diagram, let’s assume that a tax imposing country is small, and thus is a price taker at the international market. Furthermore, all imports are tax free. The country in focus produces both parts (engines) and final goods (cars) and exports final goods. One unit of parts is necessary for each unit of the final good (e.g. one engine for one car). The left pane (a) illustrates the supply curve for domestically produced parts; the middle pane (b) shows the domestic supply curve for the final good produced using parts; and the right pane (c) indicates the world supply and demand for this final good (Figure 2).

Imposition of an export tax on parts lowers their domestic price by the size of the tax (P_y to $P_y - t_y$), as producers are indifferent between selling at home tax free and selling abroad and paying tax (pane a). The total quantity produced decreases (Q_{y0} shifts to Q_{y1}); producers suffer from a loss of surplus denoted by the shaded area.

There is a link between the cost of parts (P_y) and the position of the supply curve for the final good that uses the parts as inputs (Q_{z0}). The final goods supply curve is a sum of the direct marginal costs (MC) and the price of the required parts; it is denoted S_{z0} and raises in parallel with MC due to assumption of one part is required for each final good (pane b). Upon imposition of an export tax on parts, the final good’s producers gain as they have access to them at a lower price. Their supply curve of final goods S_{z0} shifts outwards to S_{z1} , and their output raises (Q_{z0} shifts to Q_{z1}). The price of the final good (P_z) is defined by the international market shown in pane (c).

The assumption of a small country is not critical. The effect will be present in a large country in the same way but to a lesser extent, as the domestic price will decrease by an amount smaller than tax (t_y), with part of the tax burden absorbed by foreign buyers (except of an extreme case where the tax is fully passed on the importers).

The assumption of downstream and upstream industries is not critical either. If an export tax is imposed on final goods, e.g. agricultural produce in Argentina, than the tax benefits final consumers (population) at the expense of producers (land owners). Another example is an export tax on energy applied by Russia which benefits all industrial production by offering inputs costing below international market price and acting akin a production subsidy.

In total, **Figure 2** illustrates important political economy aspects of export taxes. Independently of the ToT effect, export taxes on parts benefits domestic consumers of parts (downstream processing industries) and disadvantages producers of parts.

To sum up chapter 1, research on export taxes is fraught by a lack of data and dispersed across a wide range of issues. Various approaches, ranging from theoretical contributions, CGE models, gravity-type models and case studies have been briefly summarized in the above chapter, followed by a schematic representation of two main channels transmitting the impact of export taxes – ToT and a wedge between domestic and international prices affecting the distribution of income in the tax imposing country.

2. Description of raw data

2.1. Scope and definitions

This sub-section defines the scope of the dataset by reviewing practical aspects of application and implementation of export taxes and stipulating which aspects have been taken into account. [Eliezer Ayal \(1965, p.330\)](#) links a lack of analytical work on the economic impact of export taxes to “*the extreme dearth of relevant data: the variety of, and the rapid changes in, measures that could be subsumed under the term “export taxes”; the necessary dependence on analytical concepts which are difficult to quantify (such as incidence) and the multiplicity of institutions and products involved.*”

Half a century on, the problems remain; countries apply complex tax regimes involving multiple tax forms, agencies and rates.

2.1.1. Actually paid export taxes are included

The dataset contains total tax rate payable by companies independently of the name or status of taxes. Temporary taxes, which contrary to their name can be in force for extended periods of time, are explicitly incorporated into the total tax payable by companies. This approach is motivated by expectation that the dataset will serve in estimation of the impact of export taxes. The impact are driven by the export and pricing decisions taken by companies which take into account the sum of taxes that they are expected to pay, independently of their name.

Furthermore, this approach avoids a confusion created by the use of the term ‘temporary’ signifying ‘short-term’ by some countries (e.g. Malawi) and ‘temporary’ signifying ‘additional to or replacing permanent taxes’ by the other. For example, the Chinese export tax consists of ‘export tariff’ and ‘interim tariff’ (shown in [Table 1](#)), and if the ‘interim tariff’ is specified for a product than its rate prevails over the rate of the ‘export tariff’ (only ‘interim tariff’ has to be paid in such cases). In other countries multiple export taxes are applied and they need to be summed together to calculate the total rate paid by companies, e.g. in Côte d’Ivoire exporters pay export tax and annual registration tax (calculated as percentage of total exports).

Table 1 Export taxes imposed on selected minerals by China, 2010

Mineral	Product form	Export tariff, %	Interim tariff, %	WTO Accession Annex 6, %
Bauxite	Aluminium unwrought, not alloyed, >99.95% pure	30	0	
	Aluminium unwrought, not alloyed, <99.95% pure	30	15	
	Unwrought aluminium alloy	30	15	30
	Waste or scrap, aluminium	30	15	30
Fluorspar	Fluorspar, >97% calcium fluoride		15	
	Fluorspar, <97% calcium fluoride		15	
Magnesium	Magnesium unwrought > 99.8% pure		10	
	Magnesium unwrought		10	
	Magnesium waste or scrap		10	
	Fused magnesia		10	
	Dead-burned magnesia		10	
	Light-burned magnesia		5	
	Natural magnesium carbonate (magnesite)		5	
	Magnesium oxide		5	
	Other mineral products with 70% or more magnesia		5	
Manganese	Manganese ores, concentrates, iron ores >20% manganese		15	
	Manganese, articles thereof, waste or scrap		20	
	Ferro-manganese, >2% carbon	20		20
	Ferro-silico-manganese	20		20
Phosphate	Natural calcium phosphates, unground		35	
	Natural calcium phosphates, ground		35	
	Yellow phosphorus	20		20
	Other phosphorus	20	10	20
Silicon	Silicon, <99.99% pure		15	
	Ferro-silicon, >55% silicon	25		25
	Ferro-silicon, <55% silicon	25		25
Zinc	Zinc, not alloyed, unwrought, >99.995% pure	20	0	
	Zinc, not alloyed, unwrought, >99.99% pure, <99.995% pure	20	5	
	Zinc, not alloyed, unwrought, <99.99% pure	20	15	
	Zinc waste or scrap		10	20
	Zinc ores and concentrates	30		
	Ash or residues containing hard zinc spelter		10	30
	Ash or residues containing mainly zinc (not spelter)		10	
Coke	Coke, semi-coke of coal, lignite, peat & retort carbon		40	

Source: Karapinar (2010)

Customs and other services fees and para-fiscal contributions to associations and marketing boards are excluded. All other export taxes were taken into account independently of their names, e.g. temporary export surtax applied by Cameroon, export development fee in Ghana, cocoa exporter registration duties in Côte d'Ivoire or South Africa Diamond Levy. In this paper, all such taxes are referred to as export taxes, and the terms export tax, export duty and export cess are used interchangeably.

Even though a large effort has been put in obtaining information on rates actually paid by companies, it was hardly possible to take into account exceptions that are not clear from product descriptions or the rate of the tax. For example, there are exemptions from Diamond Export Levy applied by South Africa if companies sell diamonds on the South African Diamond Bourse. This and similar exceptions that depend on the companies behaviour are not taken into account during the construction of the dataset.

2.1.2. Para-fiscal contributions to associations and customs service fees are excluded

Following the GATT, export taxes are explicitly excluded from services fees stipulated in Article VIII(a) and are required to be “*limited in amount to the approximate cost of services rendered and shall not represent an indirect protection to domestic products or a taxation of imports or exports for fiscal purposes.*” (GATT 1947, p.14). The current datasets respects this distinction. Many countries apply small flat fee to all exports to cover the costs of operating the Customs. Such fees are not taken into account. Likewise, fees for other services rendered to exporters, such as inspection, veterinary or sanitary charges (e.g. tax on sanitary inspection of exports applied by Cameroon) are not taken into account.

Furthermore, para-fiscal contributions that are levied on exports and paid by companies to exporters' or industrial associations and other stabilisation and promotion funds (as oppose to Customs authority) are not taken into account for two reasons. First, such para-fiscal contributions are returned to the sector to promote its development and provide direct or indirect benefits for paying exporters, e.g. export charge on coffee collected by the National Coffee Growers' Federation of Colombia or contributions by fish exporters to the Norwegian Seafood Export Council. Second, information on such contributions is very difficult to obtain as it is scattered across associations and is not accounted for by Customs. Following similar logic, contributions to marketing boards, e.g. duties on selected agro-products by the marketing board in South Africa, are also out of scope of the current dataset.

2.1.3. Bilateral rates

The dataset takes into consideration tax preferences granted by tax-imposing exporting countries to each trading partner. Most of such preferences, with exception of Brazil, are granted in the framework of trade agreements (see [Table 2](#) for selected examples).

Table 2 Examples of preferential tax arrangements

Country	Partner countries benefiting from export tax preferences	Scope of export tax preferences
Azerbaijan, Belarus, Russia, Ukraine	CIS FTA member countries	All export taxes are zero.
Brazil	Selected countries not related to Brazil's trade agreements	Higher taxes on selected products to applied to selected countries in South and Central America and the Caribbean.
Malaysia	ASEAN member countries	Zero export taxes on selected products. For the remaining products tax rates are the same as to the rest of the world.

2.1.4. Official taxes (as opposed to bribes) payable by legal entities

The dataset covers taxes officially imposed on legal entities. Unofficial export taxes and bribes (e.g. export taxes paid to sell Congolese goods in Burundi while Congo does not officially use export taxes ([World Bank 2012](#))) cannot be taken into account. Furthermore, the dataset does not include regulation on export taxes applied to natural persons (e.g. Turkmenistan has two schedules, distinguishing between exports by natural persons and legal entities) or special privileges granted to state-owned enterprises.

2.1.5. Applied (as opposed to tax bindings or maximum allowed rate)

Newly acceded countries (China, Mongolia, the Russian Federation, Saudi Arabia, Ukraine and Vietnam) have bound their export taxes as part of their WTO accession packages. This means, that similar to import tariffs these countries have a schedule with applied export taxes and a schedule with binding commitments on export taxes (see [Table 1](#) above comparing applied and bound rates for selected products exported by China).

Furthermore, for some countries (e.g. Bangladesh, Benin, Brazil and Thailand) the maximum export tax rates that can be potentially imposed are specified in the Customs code or other legislation. Such rates are sometimes called 'statutory' rates. They represent a legal obligation by the government, as oppose to the actual tax rate in force. The current dataset is based on the *applied* tax rates and does not specify export tax bindings or maximum allowed (statutory) rates.

2.1.6. Out-of-scope policies

This dataset is limited to taxes and does not cover other measures that can have an impact similar to export taxes, for example, production, mining and income taxes, royalties and profit sharing

arrangements for industries which produce mainly for exports. Likewise, the data on multiple exchange rates or unfavourable exchange rate, which can have an equivalent impact to a uniform export tax, are not covered. Export quotas, prohibitions, withdrawals of export tax refunds and minimum reference prices are out of scope of this dataset.

To sum up, the PET dataset includes bilateral official export taxes applied to legal entities that are collected by Customs for state or local budgets (as oppose to funds reinvesting proceeds back to the sector, or services fees). The discussion is summarized in [Table 8](#) which provides definition of various export taxes and specifies which ones are taken into account.

2.2. Existing datasets

Governments have information on export tax rates as Customs is charged with collecting these taxes. The tax rates are supposed to be public; yet, as these taxes are payable by local companies, they are less accessible than import tariffs (that are destined for foreign companies and often available in English). As a demonstration, [Box 1](#) below provides an example of actual export tax regulation applied by Egypt.

The existing international datasets are described in the subsection below. All of them have been produced by institutions (namely WTO, OECD and IFPRI) highlighting the importance of the data and the amount of effort required to gather multi-country information. While these institutional datasets provided a good starting point for data collection, most of the data in the current dataset have been obtained directly from the national institutions in charge ([Table 9](#)) to ensure complete product coverage, inclusion of bilateral preferences, multi-year information and the availability of HS6 codes.

2.2.1. WTO TPRs and accession documents

The largest volume of data on export taxes is publically available in the WTO Trade Policy Reviews (TPRs) and WTO accession documents. Unfortunately it is provided in a manner rendering any quantitative analysis difficult. World Trade Report ([WTO 2010](#)) describes two major limitations encountered while using export tax information from TPRs. First, information for different countries refers to different time periods, as reviews are not undertaken yearly. Second, the level of product aggregation varies by country, and often data is highly aggregated, allowing for a cross-country comparison only at HS 2-digit level. This enables certain types of analysis, but the estimations are biased upwards, because even if only one HS 6-digit product is subject to tax, the entire HS 2-digit group will be included.

Furthermore, WTO members do not assume any commitments related to export tax notifications. There is no obligation in the Agreement of Agriculture (AoA) to notify export taxes. There is a

transparency recommendation with respect to reviews of Members' implementation of commitments under AoA and export taxes are mentioned in the indicative list. This however does not represent an obligation and Members do not notify their export taxes to the WTO Secretariat.

2.2.2. OECD Inventory of the restriction on raw materials

For industrial raw materials, the OECD is constructing an Inventory of the restrictions on raw materials, first version of which is available publically since the end of 2012 ([Fliess and Mard 2012](#)). The inventory includes more than a dozen measures that restrain export activities, e.g. export taxes, quotas and VAT tax reduction. The dataset covers measures applied in 2009-2010 by 100 countries-producers of raw materials.

The OECD has applied the following approach for selecting countries and products into the inventory. First, 75 mostly non-energy minerals and metals in unprocessed and semi-processed form has been selected. Then, five leading producers of each material and possibly other countries have been surveyed. Thus, not all raw materials are covered in each country, and not all countries are covered for each material. This approach has advantages and drawbacks. Focusing first on largest producers ensures that the most relevant data is covered first, yet the resulting sample selection may lead to biased results if the inventory is used in empirical studies based on econometric estimations.

2.2.3. IFPRI CGEM

Faced with a poor data on export taxes in the Global Trade Analysis Project (GTAP) dataset¹, researchers in the International Food Policy Research Institute (IFPRI) developed a cross-country dataset of export taxes applied by 60 countries ([Bouet, Estrades, and Laborde 2011](#)). The dataset is based on the data from DG TRADE of the European Commission² supplemented by the WTO TPRs and other sources and has been used for CGEM studies.

The dataset does not cover bilateral export taxes (tax preferences granted by tax-imposing nations to their partner countries) and temporary taxes. For energy products, such as natural gas, the GTAP7 approach is used, where the export tax is assumed to be equal to the distortion between its domestic price and export prices. The difference obviously captures the effect of all export policies, for example export quotas. The resulting dataset, therefore, captures a mixture of policy instruments depending on the product.

¹ The GTAP7 dataset does not cover export taxes for agriculture, has outdated coverage and lacks information on several countries.

² The data from IFPRI are not publically available. Following the author's request directly to the DG TRADE of the European Commission, the DG TRADE indicated that the data are not open to public as they are part of on-going policy files.

The new PET dataset is complementary to the OECD and IFPRI data (The major differences between three datasets are summarized in [Table 3](#) below). The distinguishable features of the PET dataset that make it particularly suitable for empirical studies include its panel approach, complete product coverage for each surveyed country, inclusion of bilateral tax preferences and internationally comparable format based on the AVEs of export tax rates.

Table 3 Datasets on export taxes

Variable	Coverage (as of end 2012)		
	Panel Export Tax (PET) Dataset	OECD Inventory (Fliess and Mard 2012)	IFPRI (Bouet, Estrades, and Laborde 2011)
Applying country	20 countries (limited to countries where tax rates change over time)	100 countries	60 countries
Years	2 years (2000-2011)	2 years (2009-2010)	1 year (2007)
Commodity	All (around 5200 HS6 lines)	Raw and semi-processed materials (around 100 HS6 lines)	All goods, but energy products follow a different methodology
Product disaggregation	HS6 and national tariff line (aggregated from NTL)	HS6 (NTL specified in some cases)	HS6
Type of export restrictions covered	Export tax	Export tax, export quota, export prohibition, licensing requirement, minimum export price/price reference for exports, dual pricing scheme, VAT tax rebate/ withdrawal, restriction on customs clearance point for exports, qualified exporters list, domestic market obligation, captive mining	Export tax
Value	Export tax rate	Where applicable, e.g. export tax rate	Export tax rate
Tax preferences	Included	Mentioned in the note	Excluded
Temporary export taxes	Included	Included	Excluded

2.2.4. Other datasets (GTA, EC, IMF)

Other datasets that contain information on export taxes include Global Trade Alert, Market Access Database of the European Commission and IMF Data and Statistics, all of them available publically.

Global Trade Alert (GTA) that has been set up in 2008 to monitor trade policies during the crisis, contains information on export taxes, but is limited to new or modified measures. It does not cover the stock of measures enacted prior to 2008. The GTA distinguishes between green, amber and red measures, depending on their distortionary impact. As of November 2012, GTA reported 169 regulations on export taxes and restrictions, of which 126 were in force, of which trade distortive measures were applied by 68 jurisdictions to 265 tariff lines.

Market Access Database of the European Commission displays a limited number of records on export taxes. As of November 2012 only selected products and seven countries imposing export taxes were included; yet it also provides actions taken by the European Commission for safeguarding the interests of European exporters.

The Data and Statistics of IMF contain information on sources of government revenues. The IMF data allows identification of countries applying export taxes but the rates of export taxes cannot be deduced, as real total revenues are always different from the theoretical ones (defined as export tax rate multiplied by the value of exports).

To sum up, the newly constructed Panel Export Taxes (PET) dataset covers export tax rates at the product level for 20 countries and 2 years in the period 2000-2011¹. The surveyed countries include jurisdictions where the reported rates of export taxes have changed in the past 10 years, and for which it was feasible to obtain data from national or international sources. While the PET dataset does not cover all countries applying export taxes, it goes beyond existing publicly available datasets. The further extension of the dataset is welcome but the scope of the undertaking requires an institutional effort.

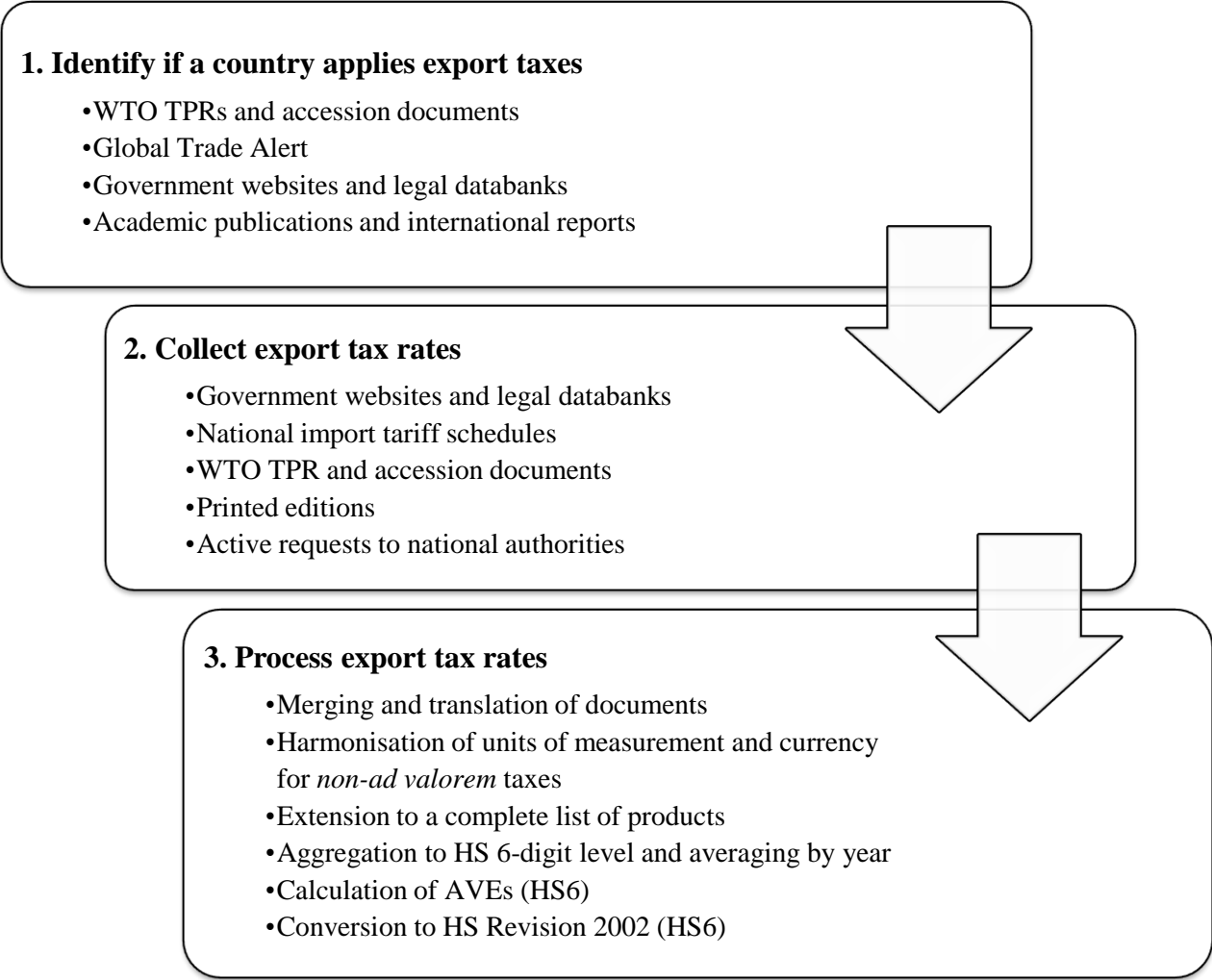
¹ An auxiliary country-level dataset (indicating whether a country imposes export taxes) covers practically all countries and territories with independent customs policies. The country-level dataset and the product-level PET dataset are available at <http://olga.solleder.org/export-taxes>.

3. Methodology

3.1. Process

The construction of the database consisted of three major activities, namely identification of countries applying export taxes, collection of export tax rates, and processing collected information into a flat harmonized dataset comparable across countries (Figure 3).

Figure 3 Dataset construction process



3.2. Countries applying export taxes

The identification of countries applying export taxes was undertaken based on the information contained in the WTO TPR and accession documents, Global Trade Alert website, government websites, legal databanks, as well as academic and international publications.

Trade Policy Reviews periodically undertaken by the WTO Secretariat as well as accession documents contain sections dedicated to export taxes and restrictions and provide very valuable information on the position of each country with regard to export taxes. Global Trade Alert, a website monitoring policies affecting world trade is another useful source publishing all new measures that can affect foreign trade interests, including export taxes, since 2008. Global Trade Alert is especially valuable for identification of cases when countries generally not applying export taxes resort to them on a temporary basis.

For some countries comprehensive information is available on the websites of national authorities, but in general online information by official authorities is patchy. A lack of data on export taxes can indicate that the country does not impose them, but can also mean that export taxes are in place but the information is not adequately published or disseminated. A similar experience was reported by OECD constructing an inventory of export restrictions on raw materials (Fliess and Mard 2012). An alternative to government websites are legal databanks, i.e. online portals containing national laws and regulations.¹

IMF Data and Statistics website provides information on the sources of government revenues. Thus, the countries for which export taxes are reported as one of the sources were considered among those applying export taxes. Furthermore, for some countries information was obtained from academic publications and international reports.²

The first step in the construction of export tax rates dataset resulted in an auxiliary country-level dataset. The list of countries that apply export taxes is available in [Table 7](#).³

3.3. Rates of export taxes

At the next step of dataset construction, the tax rates for each product were collected for countries that impose export taxes and that have change their rates at least once in 2001-2011.⁴ In most cases the

¹ Legal databanks include for example <http://www.government.by/en/solutions/> a site of the Council of Ministers of the Republic of Belarus, or privately-run <http://www.garant.ru/> for the Russian Federation.

² For academic articles see for example [Choeun, Godo, and Hayami \(2006\)](#), [Deese and Reeder \(2008\)](#), [Dowd \(2009\)](#), [Hasan, Reed, and Marchant \(2001\)](#), [Kireyev \(2010\)](#), [McMillan, Rodrik, and Welch \(2002\)](#) and [Warr \(2001\)](#). International reports containing information on export taxes include [Bouet, Estrades, and Laborde \(2011\)](#), [Dos Santos and Bain \(2004\)](#), [Fliess and Mard \(2012\)](#), [OECD \(2010\)](#), [Piermartini \(2004\)](#), [Reid Smith \(2009\)](#) and [World Bank \(2011\)](#).

³ A full list of countries, including those that do not apply export taxes and those for which information is not available can be found at <http://olga.solleder.org/export-taxes>.

⁴ The results of my empirical work, e.g. estimating the elasticity of trade to export taxes, suggests that panel estimation techniques are paramount, mainly because they allow to better control for the endogeneity of export taxes to trade and omitted variables. As a result, export tax rates were collected for 20 countries that apply export

data was sourced from the website of national authorities, most often Customs Administration, Revenue Authority and Ministry of Finance or Trade. Furthermore, export taxes were sometimes reported in the same document as import tariffs schedules, or in printed versions of national legislations submitted by countries to the WTO library. WTO TPRs and accession documents were used if comprehensive information was available at the product level. Whenever it was not possible to gather a comprehensive list of export taxes for all products taking into account bilateral export tax preferences, I made a written request and an active follow-up with the national authorities in charge of export taxes. The complete list of data sources is reported in [Table 9](#).

3.4. Processing and harmonization

Transformation of idiosyncratic national regulation into a flat harmonized dataset required merging of documents, translation, conversion to unified units of measurement and currency, extension to a complete list of products, aggregation of national tariff line (NTL) data to the 6-digit level of the Harmonized System Classification (HS6), calculation of *ad valorem* equivalents (AVEs) and conversion to a single HS revision. Each step of the process is described below in detail, listing all caveats and assumptions.

3.4.1. Merging and translation

In the best case export tax rates look exactly as a complete import tariff schedule, where rates, including units of measurement for specific taxes, are listed next to every available NTL product code, specifying applicable tax preference for partner countries. In most cases, however, export tax data represent as a positive list of products at a different level of aggregation. Information often comes from various sources and can contain product descriptions without HS codes (see [Box 1](#) for an example of an export tax regulation).

For countries where export tax rates were available in several different documents, the data were merged, for example permanent and temporary tax rates (apply for example by China), general and preferential tax rates (Malaysia), product-specific export taxes (South Africa) and multiple para-fiscal levies (Cote d'Ivoire). Relevant parts of the documents, namely currency, units of measurement for specific taxes, and comments related to export tax rates and their application were translated into English.

taxes and that have changed the rates of export taxes in the past 10 years. A handful of other countries satisfy these characteristics but the effort required to obtain the data is beyond the utility of further expanding the dataset.

Box 1 Example of an export tax regulation (Egypt 2011)

Al-Wakaye Al-Mesreya / Government Bulletin - Issue No. 135 (Supplement)
Dated 13 June 2011

Ministry Of Industry and Foreign Trade
Decree No. 277 Of The Year 2011
On Imposing An Export Duty
On Certain Kinds Of Scrap And Materials

The Minister of Industry and Foreign Trade;
After Preamble

DECREES THE FOLLOWING

Article: 1

En Export Duty shall be imposed on the metal scraps illustrated in the following table as are respectively assigned thereto:

H.S Code	Description	Duty L.E/Tonne
74.01	Copper mattes; cement copper (precipitated copper).	8000
7402.00	Unrefined copper; copper anodes for electrolytic refining.	
74.03	Refined copper and copper alloys, unwrought.	
7404.00	Copper waste and scrap.	8000
7419.91	Cast, moulded, stamped or forged, but not further worked	

[...]

7902.00	Zinc waste and scrap.	
79.03	Zinc dust, powders and flakes.	

Article: 2

An Export duty amounting to L.E 1500 per tonne, shall be imposed on all wastes, parings and scraps of plastics.

Article: 3

An Export duty amounting to L.E 1200 per tonne shall be imposed on paper or paperboard (dashed paper) wastes and Scraps.

Article: 4

Any provision contradicting the provisions of the present decree shall be superseded.

Article: 5

The present decree shall be published in the Al-Wakaye Al-Mesreya / Government Bulletin and shall apply for one year as of the day following its publication date.

Issued on 13/6/2011

Minister of Industry and Foreign Trade
Dr./ Samir Youssef El-Sayyad

3.4.2. Conversion to unified units of measurement and currency for non-*ad valorem* taxes

Around a quarter of tax rates are expressed in *non-ad valorem* (NAV) forms. Similar to import tariffs, NAV export taxes include specific, compound and mixed form, variable levies and technical taxes. A dummy variable ‘*specific*’, equal to one for NAV taxes and zero otherwise, was introduced to the dataset to flag specific and other NAV taxes. The NAV tax rates are presented below with example, followed by the description of procedure required for harmonisation of the units of measurement and the currency units.

Specific taxes are expressed as a fixed payment per a physical unit of good, the rate of the variable levy depends on the price of the exported product, while the rate of technical taxes depends on the product properties that are not captured in the HS description of the product, for example whether logs are sourced from cultivated plantations. The rate of variable export duties depend on the price of goods, for instance Sri Lanka applies a variable export tax on quartz. Compound taxes contain an *ad valorem* and a specific component, while mixed taxes specify a payment of either specific rate or an *ad valorem* rate subject to an upper or lower limit. For example, in 2010 the Russian Federation taxed exports of logs at a rate of 6.5% but not less than 4 euro per cubic meter.

The rates of NAV taxes were harmonized to units of the metric system (e.g. a dozen of pieces was converted to 12 pieces, and one tonne was converted to 1000 kg) and parsed into a numeric value, a measurement unit and a currency unit.

NAV tax rates can be reported in domestic currency of the applying country or in third-party currencies. US dollars and euro are most frequent, but other currencies can be also used, for example specific export taxes applied by Azerbaijan in 2000 were denominated in the European Currency Unit (ECU). All NAV taxes denominated in currencies other than US dollars were converted to US dollars using mid-point exchange rates sourced from Oanda¹. A simple yearly average (January to December) of the year of the application of export taxes was used, independently of the start and the finish of the fiscal year or entry into force of export taxes.

3.4.3. Calculation of AVEs (HS6)

NAV rates make it difficult to compare taxes and to evaluate the rate of protection. Consequently, *ad valorem* equivalents (AVEs) or tax expressed as a percentage of the value of goods were calculated for NAV duties using a methodology described below.

¹ Oanda is an online platform providing forex trading, as well as current and historic currency information (www.oanda.com)

The AVE (t_{AVE}) of a specific component of a NAV tax rate is equal to the specific rate (t_{NAV}) divided by the unit value (UV) and multiplied by 100 in case of AVE expressed in percentage terms:

$$t_{AVE} = 100 * \frac{t_{NAV}}{UV}$$

Unit value (UV) is calculated for each product by dividing trade values (TV) by trade quantities (TQ):

$$UV = \frac{TV}{TQ}$$

Methodologies for calculating AVEs (e.g. [Berthou and Emlinger \(2011\)](#), [WTO, UNCTAD and ITC \(2007\)](#)) mainly differ with regard to the approaches taking for selecting the level at which AVE is calculated (e.g. HS6 or NTL), trade volumes and values (e.g. bilateral, group or world trade flow), treatment of outliers and cases for which trade data is not available. The selection of most appropriate methodology depends on the objective of the research; with consistency and transparency being important requirements.

For the AVE calculation, I have made the following choices. The AVEs are calculated at the HS6 level, which allows for international comparison and does not depend on idiosyncratic national schedules. Total export flows of each HS6 (product's export to the world by the tax-imposing nation) is used to reflect the differences in prices by origin of product as the exporting decision of the enterprises is taken depending on the prices they face (as opposed to the international prices of the product). Bilateral trade data was not used as products are generally exported only to a few destinations. Outliers were kept in the dataset as they are most likely to represent export taxes designed to be prohibitive rather than overestimated values. When trade data was not available for the product and year in focus, exporter statistics from the nearest 2 years was used. In case the product was not traded in the span of 5 years, world trade data (product's total world exports) was utilized.

In case of compound taxes the AVE of the specific component was added to the *ad valorem* component. For mixed taxes the *ad valorem* component was used. Most mixed taxes specify a lower limit and have been most likely put in place to prevent revenue loss due to under-invoicing. For this to work, the specific component of the mixed taxes should be very close to the *ad-valorem* component, so the approach of retaining only *ad valorem* parts of mixed taxes should not violate the data.

It was not possible to calculate AVEs when specific component was expressed using a different physical unit of measurement than that used for the volumes of trade statistics, such as for example an

export tax on live animals applied by Botswana and expressed in per head terms while trade statistics is expressed in kilograms¹. Furthermore, AVEs were not calculated for technical duties and variable levies, as specific information required for such calculations (e.g. origin of logs, cocoa content or price of each transaction) is not available in standard trade statistics. To retain information in the dataset a variable ‘*taxdummy*’, equal to one when an export tax is applied and zero otherwise, was introduced in the dataset. For cases described above the AVE is missing but ‘*taxdummy*’ signals the presence of tax.

3.4.4. Extension to a complete list

In most cases export taxes are reported as a positive list, i.e. the list containing only taxed products, and at different level of aggregation, from a specific NTL product to larger groups, such as “all crops”. Furthermore, in some cases product descriptions are available without their corresponding codes (e.g. “waste, parings and scraps of plastic” in the example in [Box 1](#)).

In cases where HS codes were missing they were assigned manually using the descriptions from revision 2 of the HS classification². The positive list was expanded to a complete list at HS6 and NTL level by using national product schedules reported for import tariffs in the same year as the year of the application of export taxes.³ In cases where import tariff schedules were not available for the year in question, the data from the nearest available year, preferably based on the revision 2 of the HS classification was used. The resulting NTL datasets contain export tax rates at the most detailed level of product classification which is country-specific.

3.4.5. Aggregation to HS 6-digit level and averaging by year

To ensure that the export tax data is comparable across countries and matches trade statistics, the national datasets were aggregated to HS 6-digit level and averaged by year. Export tax rates were aggregated from NTL level to harmonized HS 6-digit level using simple average rates of taxed products. Cases of partial coverage, i.e. HS6 products which contain both taxed and non-taxed NTL products were flagged using a dummy variable ‘*partial*’ equal to one when the tax rate does not cover

¹ Volumes of trade are generally recorded in two units of measurement. The primary unit is most often kg, while the secondary unit is recommended by World Customs Organisation depending on the product characteristics e.g. square meter, number of pairs or weigh in carat ([Reister and Muryawan 2009](#)). Using two reported measures as well as mirror statistics (in cases exporter and importer report different units) it is possible to construct empirical conversion factors for different physical units of measurements. Nonetheless, to avoid measurement errors, I opted for calculating AVEs only for the cases where units of trade statistics correspond to the units of a NAV tax. Around 4% of all observations are non-convertible (except for Azerbaijan with 39% non-convertible lines).

² For identification of product codes I used an online search engine available at <http://www.trademap.org/advancedproductsearch.aspx> upon registration.

³ Import tariff schedules are available in ITC’s Market Access Map <http://www.macmap.org> upon registration.

the entire HS6 group and zero otherwise. In some cases, e.g. China, the rates are specified for products detailed at a finer level than NTL. Such cases were also marked using variable 'partial'.

The national approaches to setting the rates of export taxes differ greatly – from tax rates changed multiple times a year, e.g. in India and Russia, to rates unchanged for the last decade, e.g. Azerbaijan. Furthermore a number of countries have their fiscal year starting in March-June, while their trade statistics is reported for the calendar year (January-December) e.g. Nepal. Both cases require assumptions for averaging export tax rates by year. In case of countries that change their export tax rates several times a year, the rates of the first change was taken as the yearly average. In cases where a different tax rates were applied depending on the season, e.g. China, a simple average of applied rates was used. Whenever temporary tax rates superseded permanent rates for more than 6 months, temporary tax rates were used. For countries where fiscal year starts in March-June, the export taxes of that year were assumed to be applied throughout the calendar year.

3.4.6. Conversion to HS Revision 2002 (HS6)

HS classification is updated every 5 years and countries adopt it immediately or with some lag. Furthermore, export taxes put in place over time may be expressed in different HS revisions (e.g. Ukraine). As my dataset spans over 10 years, it contains data reported in three different HS revisions. Consequently, all 6-digit level data were converted to revision 2 to of the HS classification. This ensured a clean match with cross-country trade statistics and prevented cases where the same products have different codes because of the HS classification revision¹.

The resulting HS6 dataset contains export tax rates and *ad valorem* equivalents of NAV rates at HS6 digit level (**Table 4** below lists all variables and their descriptions). Two main features of the dataset are its comprehensive coverage and harmonized format. The dataset includes export tax rates of 20 tax-imposing nations applied to all importing countries (rates are destination specific)², for 2 time periods (capturing a change in rates occurring in the span 2001-2011) and all products (around 5200 HS6 products per country). An aligned definition across countries, ad-valorem equivalents of specific taxes and conversion to a single HS revision (HS Rev.2002) make this dataset comparable across products, countries and time periods.

¹ To convert data reported in revision 1 (1996) and revision 3 (2007) to revision 2 (2002) of the HS product classification I used correlation tables available at the website of the World Customs Organisation http://www.wcoomd.org/en/topics/nomenclature/instrument-and-tools/hs_nomenclature_older_edition.aspx.

² The current dataset covers 169 largest importing countries and territories (partner countries) and can be easily extended to all importing countries.

Table 4 Variables' description of the HS6 level dataset of export taxes (PET Dataset)

Variable name	Variable description
reporter	ISO 3-digit numerical code for the country or customs territory applying export tax (and exporting the product in focus).
partner	ISO 3-digit numerical code for the partner country or customs territory that is subject to export tax (and the importer of the product in focus).
year	Year of application (validity of) of export taxes.
hs6	Harmonized System (HS) 6-digit code in revision 2002.
taxdummy	A dummy variable equal to one if at least one NTL code in the HS6 product is subject to an export tax, and zero if products are not subject to tax. The variable is bilateral; it takes into account preferences granted by tax imposing countries.
specific	A dummy variable equal to one if at least one NTLC code in the HS6 product is subject to specific or any other non- <i>ad valorem</i> (NAV) export tax, and zero if products are subject to ad-valorem tax or free of tax.
partial	A dummy variable equal to one if a taxed HS6 product contains NTL codes that are not subject to export taxes.
taxave	Tax rate in percentages. For ad-valorem tariffs it is the reported rate or the simple average of the rates applied at NTLC level. For NAV rates, it is the AVE calculated at the HS6 digit level. Missing data (.) indicates cases where NAV export tax is applied but AVE cannot be calculated. The variable is bilateral; it takes into account preferences granted by tax imposing countries.

4. Stylized facts

This section presents stylized facts on export taxes, focusing on the frequency and rates of export duties. Frequency is defined as a number of taxed goods in the total number of goods per category, while coverage estimates the share of trade subject to taxes. All figures in this section are based on the PET dataset (see [Table 10](#) of Annex for summary statistics).

4.1. Export taxes by product category

Frequency and rates of export taxes are linked to the product characteristics. Agricultural goods are taxed at a higher rate (24% against 17% on average, [Table 5](#)), while the frequency is the highest for extractive industries (7.5% of HS6 codes are taxed compared to 1.4% on average). Both rates and frequency is decreasing with the level of processing. While 4.7% of unprocessed goods are taxed at 19.9%, only 0.4% of finished goods are taxed, and they are taxed at 13.1%. Furthermore, both rates and frequency are increasing with the market share of products. Countries impose export taxes on goods with large market share more frequently than on goods with small market share (1.7% and 0.7% respectively) and the rates are higher (18.9% against 15.9%).

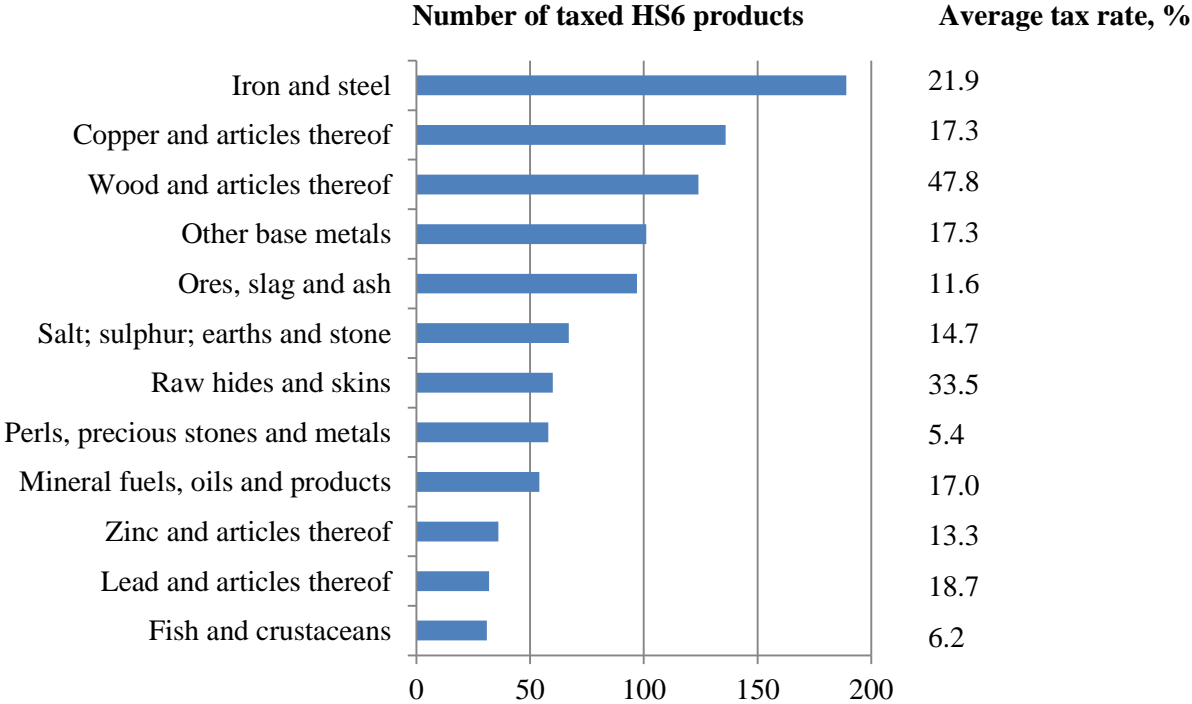
Table 5 Number of taxed goods and average tax rate (of traded goods), by product category

	(a) Products subject to export tax		(b) Average (unweighted) tax rate
	Number of products	Share in category	
Sector			
Agriculture	3813	2.1%	24.0%
Manufacturing	8822	0.7%	17.9%
Extractive industries	9905	7.5%	13.6%
Level of processing			
Unprocessed	5562	4.7%	19.9%
Semi-processed	12818	3.0%	17.0%
Finished	4160	0.4%	13.1%
Market share of product			
Small	2927	0.7%	15.9%
Medium	12870	1.6%	16.2%
Large	6743	1.7%	18.9%
Total/Average	22540	1.4%	17.0%

Note: The table is based on the PET dataset including 20 tax imposing exporting countries, 169 partner countries 2 time periods and all traded goods subject to export tax. Extractive industries include minerals, metals and other products of mining, as well as forestry and fishery products. Small market share refers to the good in the lower quartile (in sample), large market share refers to the upper quartile, and the remaining goods belonging to the interquartile range are assigned to the medium market share category.

Export taxes are concentrated on a number of product groups. Within extractive industries, frequently taxed commodities include mineral fuels and metals, with iron and steel being most taxed (Figure 4, based on sample of 20 countries). Countries often tax hides and skins, forestry and fishery products. Cereals and oilseeds are most taxed agro-food products (Table 11 in Annex).

Figure 4 Most taxed product groups and average tax rates



Note: Based on the general tax rate of 20 tax-imposing nations (see Table 11 in Annex for an exhaustive list).

4.2. Export taxes by country

Export taxes within each country are idiosyncratic, but tend to reflect production and export structure. Azerbaijan, Pakistan and Vietnam impose export taxes to extractive industries, while in Côte d’Ivoire, Mongolia and Nepal most export duties are applied to agricultural goods (Table 6). Average tax rates vary by country with ad-valorem equivalents as low as 2-5% in Azerbaijan, Papua New Guinea, Thailand and South Africa, and as high as 89% in Nepal.

Table 6 Number of taxed products by country and industry

Country	Year	Number of taxed HS6 products			Average tax rate,%
		agriculture	manufacturing	extractive	
Azerbaijan	2001	0	15	93	2.0
Bangladesh	2011	2	0	0	10.0
Belarus	2008	0	0	0	31.2
Brazil	2007	10	2	0	9.0
China	2009	18	71	163	20.0
Côte d'Ivoire	2009	10	0	0	18.9
Egypt	2011	0	9	34	26.5
Malawi	2011	0	14	0	50
Malaysia	2011	18	5	52	9.9
Mongolia	2011	2	0	0	3.6
Nepal	2010	47	20	22	89.2
Pakistan	2007	0	2	102	25
Papua New Guinea	2008	0	12	30	5
Russian Federation	2009	41	38	76	12.8
South Africa	2008	0	2	3	5
Sri Lanka	2010	17	9	15	33.8
Thailand	2011	0	54	9	5
Ukraine	2009	12	7	33	26.1
Viet Nam	2009	6	8	145	115
Zambia	2011	0	0	13	22.7

Note: Based on general tax rate of 20 tax-imposing nations

The application of export taxes has intensified over time. The number of countries that apply export taxes has increased two-fold since 1960s, reaching 111 jurisdictions (see [Table 7](#) of the Annex). A wider scope of products is covered by export taxes and the rates are changed more frequently, several times a year in some countries. However, the frequency and coverage of export taxes on average does not show an upward trend. The number of taxed products has decreased or remained stable in the last 7 years in half of the surveyed countries, while the share of trade subject to export taxes decreased in 58% of cases.

To sum up, the number of taxed products and the rates of export taxes depend on the tax-imposing country and product characteristics. Even though the number of countries taxing exports has increased significantly, the frequency and coverage ratio within countries remain stable on average.

5. Concluding remarks

The innovation of this paper is data driven. The scarcity of relevant data has precluded a systematic research on export taxes, albeit this policy instrument is increasingly employed and has a broad range of implications. By providing harmonized and comparable data on export tax rates, this work can lay the foundations for quantitative empirical research on export taxes. The possible avenues for such research include trade, economic and welfare effects of export taxes and their effectiveness for stated policy objectives; price effects and incidence of export taxes; export taxes in trade agreements, tax cartels and GATT/WTO, as well as endogenous determinants of export taxes.

Bibliography

- Akiyama, Takamasa. 1992. *Is There a Case for an Optimal Export Tax on Perennial Crops?* Vol. 854. International Economics Dept., World Bank.
- Akiyama, Takamasa, Donald F. Larson, and DEC. 1994. "The Adding-up Problem : Strategies for Primary Commodity Exports in sub-Saharan Africa". Policy Research Working Paper Series 1245. The World Bank. <http://ideas.repec.org/p/wbk/wbrwps/1245.html>.
- Auquier, A.A., and R.E. Caves. 1979. "Monopolistic Export Industries, Trade Taxes, and Optimal Competition Policy." *The Economic Journal*: 559–581.
- Ayal, Eliezer B. 1965. "The Impact of Export Taxes on the Domestic Economy of Underdeveloped Countries." *Journal of Development Studies* 1 (4): 330–362.
- Baldwin, Richard. 2013. "Lessons from the European Spaghetti Bowl." *Mimeo*.
- Bandyopadhyay, Subhayu, and Baishali Majumdar. 2004. "Multilateral Transfers, Export Taxation and Asymmetry." *Journal of Development Economics* 73 (2) (April): 715–725.
- Berthou, Antoine, and Charlotte Emlinger. 2011. "The Trade Unit Values Database." *CEPII Working Paper* N°2011-10 (April 2011). <http://www.cepii.fr/anglaisgraph/workpap/pdf/2011/wp2011-10.pdf>.
- Bouet, A., Carmen Estrades, and David Laborde. 2012. "Differential Export Taxes Along the Oilseeds Value Chain A Partial Equilibrium Analysis". IPFRI. <http://www.iadb.org/intal/intalcdi/PE/2010/05897.pdf>.
- Bouet, Antoine, Carmen Estrades, and David Laborde. 2011. "A Global Assessment of Economic Effects of Export Taxes - Draft." https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=3829.
- Bouët, Antoine, and David Laborde. 2010. "Economics of Export Taxation in a Context of Food Crisis". IPFRI. <http://www.iadb.org/intal/intalcdi/PE/2010/05897.pdf>.
- Brenton, Paul, and Gozde Isik. 2012. *De-fragmenting Africa-Deepening Regional Trade Integration in Goods and Services*. http://siteresources.worldbank.org/INTAFRICA/Resources/Defrag_Afr_English_web_version.pdf.
- Broda, C., N. Limão, and D. Weinstein. 2006. "Optimal Tariffs: The Evidence". National Bureau of Economic Research. <http://www.nber.org/papers/w12033>.
- Choeun, H., Y. Godo, and Y. Hayami. 2006. "The Economics and Politics of Rice Export Taxation in Thailand: A Historical Simulation Analysis, 1950–1985." *Journal of Asian Economics* 17 (1): 103–125.
- Deardorff, A. V., and I. Rajaraman. 2005. "Can Export Taxation Counter Monopsony Power?" In *Research Seminar in International Economics, University of Michigan Working Papers*. <http://141.211.144.225/rsie/workingpapers/Papers526-550/r541.pdf>.
- Deese, W., and J. Reeder. 2008. "Export Taxes on Agricultural Products: Recent History and Economic Modeling of Soybean Export Taxes in Argentina." *Journal of International Commerce & Economics: a Cross-disciplinary Journal of International Trade Issues* 1: 185.
- Devarajan, S., D. Go, M. Schiff, and S. Suthiwart-Narueput. 1996. "The Whys and Why Nots of Export Taxation." *World Bank Policy Research Working Paper* (1684).
- Dowd, W. N. 2009. "Export Taxation: The Case of Argentina." <http://dspace.udel.edu:8080/dspace/handle/19716/4258>.
- EC. 2006. "WTO NAMA Negotiating Proposal on Export Taxes Communication from the European Communities."
- Edminster, Lynn Ramsay. 1930. "Control of Exports of Raw Materials: An International Problem." *The ANNALS of the American Academy of Political and Social Science* 150 (1) (September 1): 89–97.
- Emran, M. S. 2005. "Revenue-increasing and Welfare-enhancing Reform of Taxes on Exports." *Journal of Development Economics* 77 (1): 277–292.
- Flaaten, O., and C. E. Schulz. 2010. "Triple Win for Trade in Renewable Resource Goods by Use of Export Taxes." *Ecological Economics* 69 (5): 1076–1082.
- Fliess, Barbara, and Tarja Mard. 2012. "Taking Stock of Measures Restricting the Export of Raw Materials: Analysis of the OECD Inventory Data". OECD Publishing.

- GATT. 1947. "The General Agreement on Tariffs and Trade."
http://www.wto.org/english/docs_e/legal_e/gatt47_e.pdf.
- Goode, Richard, George E. Lent, and P. D. Ojha. 1966. "Role of Export Taxes in Developing Countries." *Staff Papers - International Monetary Fund* 13 (3) (November 1): 453–503.
- Hasan, M.F., M.R. Reed, and M.A. Marchant. 2001. "Effects of an Export Tax on Competitiveness: The Case of the Indonesian Palm Oil Industry." *Journal of Economic Development* 26 (2): 77–90.
- Hudson, Darren, and Don Ethridge. 1999. "Export Taxes and Sectoral Economic Growth: Evidence from Cotton and Yarn Markets in Pakistan." *Agricultural Economics* 20 (3) (May): 263–276.
- Irwin, D.A. 2003. "The Optimal Tax on Antebellum US Cotton Exports." *Journal of International Economics* 60 (2): 275–291.
- James, Gorton. 1924. "British Preferential Export Taxes." *The American Economic Review* 14 (1): 56–63.
- Karapinar, B. 2010. "Export Restrictions and the WTO Law: 'Regulatory Deficiency' or 'Unintended Policy Space,'" NCCR trade regulation working paper 2010/11.
http://www.wti.org/fileadmin/user_upload/nccr-trade.ch/wp4/publications/Karapinar%20-%20Working%20Paper%202010-11.pdf.
- Kireyev, Alexei. 2010. *Export Tax and Pricing Power: Two Hypotheses on the Cocoa Market in Côte d'Ivoire*. International Monetary Fund.
- Klein, H. S. 2010. *The Atlantic Slave Trade*. Cambridge University Press.
- Korinek, Jane, and Jessica Bartos. 2012. "Multilateralising Regionalism: Disciplines on Export Restrictions in Regional Trade Agreements."
- Latina, Joelle, Roberta Piermartini, and Michele Ruta. 2011. "Natural Resources and Non-cooperative Trade Policy." *International Economics and Economic Policy* 8 (2) (May 3): 177–196.
- McMillan, M., D. Rodrik, and K. H. Welch. 2002. "When Economic Reform Goes Wrong: Cashews in Mozambique". National Bureau of Economic Research. <http://www.nber.org/papers/w9117>.
- McMillan, Margaret. 2001. "Why Kill the Golden Goose? A Political-Economy Model of Export Taxation." *Review of Economics and Statistics* 83 (1) (February 1): 170–184.
- Musacchio, A., A. M. Fritscher, and M. Viarengo. 2013. "Colonial Institutions, Trade Shocks, and the Diffusion of Elementary Education in Brazil." Accessed January 13.
http://www.hbs.edu/faculty/Publication%20Files/10-075_0ad1be00-09f7-4869-9347-d965a7accd5c.pdf.
- ODI. 2012. "The Next Decade of EU Trade Policy: Confronting Global Challenges?" Overseas Development Institute. <http://www.odi.org.uk/resources/docs/7727.pdf>.
- OECD, ed. 2010. *The economic impact of export restrictions on raw materials*. Paris: OECD.
<http://dx.doi.org/10.1787/9789264096448-en>.
- Piermartini, Roberta. 2004. *The role of export taxes in the field of primary commodities*. WTO discussion papers. Geneva, Switzerland: WTO.
http://www.wto.org/english/res_e/booksp_e/discussion_papers4_e.pdf.
- Reid Smith, Sanya. 2009. "The Importance and Benefits of Export Taxes". The Third World Network (TWN). <http://www.twinside.org.sg/title2/wto.info/2009/twninfo20090916.htm>.
- Reister, Matthias, and Markie Muryawan. 2009. "Quantity and Weight Data in UN Comtrade". UNSD. <http://unstats.un.org/unsd/tradekb/Knowledgebase/Quantity-and-Weight-Data-in-UN-Comtrade>.
- Santis, Roberto A. De. 2012. "Optimal Export Taxes, Welfare, Industry Concentration, and Firm Size: A General Equilibrium Analysis." *SSRN eLibrary*.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=234870.
- Dos Santos, Paulo, and Laurel Bain. 2004. "Survey of the Caribbean Tax System". CARICOM Secretariat.
- Solleder, Olga. 2013. "Trade Effects of Export Taxes." HEID Working Papers 08-2013. Graduate Institute of International and Development Studies, Geneva.
- South Centre. 2006. "Some Reasons Not to Negotiate Export Taxes and Restrictions in the WTO NAMA Negotiations." <http://www.eldis.org/vfile/upload/1/document/0708/DOC21657.pdf>.
- Staiger, R. 2012. "Non-Tariff Measures and the WTO."

- Suzuki, Katsuhiko. 1978. "The Welfare Effects of an Export Tax Levied on an Intermediate Good." *The Quarterly Journal of Economics* 92 (1) (February 1): 55–69. doi:10.2307/1885998.
- Timilsina, Govinda R., Omar O. Chisari, and Carlos A. Romero. 2013. "Economy-wide Impacts of Biofuels in Argentina." *Energy Policy*.
- Viner, Jacob. 1925. "National Monopolies of Raw Materials." *Foreign Affairs* 4: 585.
- Wang, X., J.F. Li, and Y.X. Zhang. 2010. "Can Export Tax Be Genuine Climate Policy? An Analysis on China's Export Tax and Export VAT Refund Rebate Policies." *Idées Pour Le Débat* (8).
- Warr, Peter G. 2001. "Welfare Effects of an Export Tax: Thailand's Rice Premium." *American Journal of Agricultural Economics* 83 (4) (November 1): 903–920.
- Warr, Peter G. 2002. "Export Taxes and Income Distribution: The Philippines Coconut Levy."
- Waschik, R., and I. Fraser. 2007. "A Computable General Equilibrium Analysis of Export Taxes in the Australian Wool Industry." *Economic Modelling* 24 (4): 712–736.
- Way, Edwin. 2012. "Why Rich Nations Fail: Explaining Dutch Economic Decline in the 18th Century."
- World Bank. 2011. "Harnessing Regional Integration Trade Growth Southern Africa." http://siteresources.worldbank.org/INTAFRREGTOPTRADE/Resources/Harnessing_Regional_Integration_Trade_Growth_SouthernAfrica.pdf.
- . 2012. "Africa Can Feed Africa. Removing Barriers to Regional Trade in Food Staples." <http://siteresources.worldbank.org/INTAFRICA/Resources/Africa-Can-Feed-Africa-Report.pdf>.
- WTO. 2010. *World Trade Report 2010. Trade in natural resources*. Geneva: WTO.
- . 2012. "Request for a Waiver: Communication from Mongolia." Council for Trade in Goods, No. G/C/W/571 (26 January 2007): 1-4."
- WTO Dispute Settlement. 2012. "China – Measures Related to the Exportation of Various Raw Materials, DS394, DS395, DS398." http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds394_e.htm.
- WTO, UNCTAD, and ITC. 2007. *World tariff profiles, 2006*. Geneva: WTO.
- Yilmaz, Kamil. 1999. "Optimal Export Taxes in a Multicountry Framework." *Journal of Development Economics* 60 (2) (December): 439–465.
- Zee, Howell H. 2007. "Export Taxes in Times of Trade Surpluses." *The Journal of International Trade & Economic Development* 16 (2): 137–157.

Data sources

Exchange rates

- Oanda, <http://www.oanda.com/>

Export values and volumes

- International Trade Centre, Trade Map, www.intracen.org/marketanalysis.
- United Nations, Comtrade, <http://comtrade.un.org>

Export taxes

- Panel Export Taxes (PET) Dataset, <http://olga.solleder.org/export-taxes>
- Global Trade Alert (GTA). Policies that affect world trade, <http://www.globaltradealert.org>
- OECD. Inventory of measures restricting exports of raw materials, <http://www.oecd.org/tad/non-tariffmeasures/>
- IMF Data and Statistics, <http://www.imf.org/external/data.htm>
- EC Market Access database, <http://madb.europa.eu>

Appendices

Table 7 Countries applying export taxes

Country or territory	WTO status	Country or territory	WTO status	Country or territory	WTO status
Africa		Americas		Asia	
Angola	Member	Antigua and Barbuda	Member	Bangladesh	Member
Benin	Member	Argentina	Member	Bhutan	Observer
Botswana	Member	Barbados	Member	Cambodia	Member
Burkina Faso	Member	Belize	Member	China	Member
Burundi	Member	Bermuda		East-Timor	
Cameroon	Member	Bolivia	Member	Hong Kong, China	Member
Central African Rep	Member	Brazil	Member	India	Member
Chad	Member	Canada	Member	Indonesia	Member
DRC (Kin)	Member	Colombia	Member	Lao	Observer
Congo (Bra)	Member	Costa Rica	Member	Malaysia	Member
Cote d'Ivoire	Member	Dominica	Member	Maldives	Member
Djibouti	Member	Dominican Republic	Member	Mongolia	Member
Egypt	Member	Ecuador	Member	Myanmar	Member
Ethiopia	Observer	Guatemala	Member	Nepal	Member
Gabon	Member	Guyana	Member	Pakistan	Member
Gambia	Member	Honduras	Member	Philippines	Member
Ghana	Member	Mexico	Member	Sri Lanka	Member
Guinea	Member	Panama	Member	Thailand	Member
Guinea-Bissau	Member	Paraguay	Member	Viet Nam	Member
Kenya	Member	St Kitts and Nevis	Member	Europe	
Lesotho	Member	Saint Lucia	Member	Macedonia	Member
Liberia	Observer	St Vincent and the Grenadines	Member	Norway	Member
Madagascar	Member	Sao Tome and Principe	Observer	Turkey	Member
Malawi	Member	Suriname	Member	Middle East	
Mali	Member	Trinidad and Tobago	Member	Bahrain	Member
Mauritania	Member	Turks and Caicos		Iraq	Observer
Morocco	Member	Uruguay	Member	Iran	Observer
Mozambique	Member	CIS		Jordan	Member
Namibia	Member	Azerbaijan	Observer	Saudi Arabia	Member
Niger	Member	Belarus	Observer	UAE	Member
Nigeria	Member	Kazakhstan	Observer	Oceania	
Senegal	Member	Kyrgyzstan	Member	Fiji	Member
Sierra Leone	Member	Russia	Member	French Polynesia	
South Africa	Member	Turkmenistan		Kiribati	
Sudan	Observer	Ukraine	Member	Papua New Guinea	Member
Swaziland	Member			Solomon Islands	Member
Tanzania	Member			Tuvalu	
Togo	Member			Vanuatu	Member
Tunisia	Member				
Uganda	Member				
Zambia	Member				
Zimbabwe	Member				

Note: Countries and territories included in the table applied export taxes for at least one product at least once in the period 2007-2012. If country is not listed in the table, it either does not impose export taxes or information for this country is not available.

Table 8 Export tax definitions

Type of tax	Definition
Export tax* (included in the database)	<p>A tax collected on goods or commodities at the time they leave a customs territory. This tax can be set either on an <i>ad valorem</i> (value) basis, as a percentage paid on the value of exports (generally f.o.b. value) or in <i>non-ad valorem</i> forms, which include, inter alia,</p> <ul style="list-style-type: none"> - specific taxes (on a per unit basis), - conditional taxes (maximum of two rates), - technical duties (rates calculated based on the product characteristics not captured by the product code), - variable taxes (<i>ad valorem</i> rates depend on the price of the good). <p>Other terminology equivalent to export tax includes export tariff, export duty, export levy, export charge. In some countries the term “cess” is used. In French speaking countries, the term “exit tax” (“droit de sortie”) is often used. Export tax is generally administered and collected by the Customs.</p>
Fiscal tax on exports* (included in the database)	<p>A tax not paid at the border, but which applies only or discriminates against goods or commodities intended for export. An example is when the sales tax which a government charges is higher for goods or commodities intended for export than when these goods or commodities are offered for sale in the domestic market. Other terminology equivalent to fiscal tax on exports is export royalty.</p>
Export surtax*	<p>A tax collected on goods or commodities at the time they leave a customs territory, and which is applied in addition to the normal export tax rate. They can be part of a progressive tax system or can be adapted to price trends and thus being of a temporary nature. Example: a USD 10 surcharge is applied on each tonne of a commodity exported when the world price of this commodity exceeds USD 1800 a tonne.</p> <p>Other terminology equivalent to export surtax is export surcharge.</p>
Temporary export tax (included in the database)	<p>Export tax applied on a temporary basis, generally for less than a year, with a defined end date. Depending on the jurisdiction, temporary export taxes can replace export taxes or be applied in addition to them.</p> <p>As export taxes, temporary export taxes can be expressed in <i>ad valorem</i> and <i>non-ad valorem</i> terms.</p> <p>A temporary export tax is generally collected by the Customs on goods or commodities at the time they leave a customs territory.</p>
Para-fiscal contributions	<p>Para-fiscal contributions are sector specific taxes collected to para-fiscal stabilization funds; export promotion and promotions funds or sectoral associations, e.g. National Coffee Growers' Federation. Para-fiscal contributions are indirectly returned to tax payers, by developing or promoting industry or improving the livelihood of the employees.</p> <p>They are generally collected by the fund or association benefiting from the tax revenues before the exported goods leave the production site.</p> <p>As export taxes, para-fiscal contributions can be expressed in <i>ad valorem</i> and <i>non-ad valorem</i> terms.</p>
Bound rate of export tax	<p>The maximum allowed or ceiling rate of export tax that binds government to keep the applied rates of export taxes below their bound rates. Applied export tax rate can be equal or lower than the bound rates. The bound rates can be negotiated in the WTO frameworks, as is the case for newly acceded members, or be specified in the national legislation.</p> <p>Sometimes the term “statutory” is used as an equivalent of “bound”. The use of term statutory can be confusing, as in some countries it is also used to indicate para-fiscal contributions.</p>

* Definitions are adopted from (Fliess and Mard 2012)

Table 9 Coverage and data sources of the product-level dataset on export taxes

Country applying export taxes	Year 1	Year 2	Organization that provided data (data source)
Azerbaijan*	2000	2001	State Customs Committee (website)
Bangladesh	2010	2011	National Board of Revenue (website)
Belarus*	2008	2010	Governmental repository of legal texts under the Council of Ministers (website)
Brazil*	2005	2007	Chamber for Foreign Trade CAMEX -Câmara de Comércio Exterior (email)
China	2007	2009	General Administration of Customs (in Customs Tariff of Export of the People's Republic of China, the WTO library, paper-based)
Côte D'Ivoire	2008	2009	Kireyev 2010, and the WTO Secretariat TPR 2012 (documents online)
Egypt	2010	2011	Ministry of Finance (email)
Malawi	2010	2011	Ministry of Industry and Trade (email)
Malaysia*	2007	2011	Ministry of Trade and Industry (website)
Mongolia	2010	2011	Customs General Administration (website)
Nepal	2009	2010	Department of Customs and the Ministry of Finance (website and email)
Pakistan	2006	2007	Federal Board of Revenue (website)
Papua New Guinea	2007	2008	Department of Foreign Affairs and Trade (included in the tariff schedule submitted to ITC)
Russian Federation*	2007	2009	Legal portal "Garant" (website)
South Africa	2007	2008	South African Revenue Service (website) and Diamond and Precious Metal Regulator (email)
Sri Lanka	2009	2010	Customs Administration (website)
Thailand	2007	2011	Customs Department, Integrated Tariff Database (website)
Ukraine*	2007	2009	Legal portal "NAU" (website)
Vietnam	2008	2009	General Department of Customs (website)
Zambia	2007	2011	Revenue authority (included in the tariff schedule submitted to ITC)

Note: Countries marked with asterisk () apply preferential export taxes.*

Table 10 Summary statistics of the PET dataset

Variable	Label	Obs	Mean	Std. Dev.	Min	Max
taxave	AVE of export tax, in %	31 728 983	0.25	4.57	0	810
taxd	A dummy variable equal to one if product is subject to an export tax	31 784 168	0.01	0.12	0	1
For observations with positive tax (taxd = 1)						
taxave	AVE of export tax, in %	399 058	20.21	35.47	0.09	810
specific	A dummy variable equal to one if product is subject to non-ad valorem export tax	454 243	0.24	0.43	0	1
partial	A dummy variable equal to one if not all products within HS6 are taxed	454 243	0.37	0.48	0	1

Note: The tables is based on the dataset including 20 tax imposing exporting countries, 169 partner countries 2 time periods and all goods at HS6 level.

Table 11 Number of taxed HS6 products, by HS chapter

HS chapter	Description	No of taxed HS6 products	Average tax rate, %
01	Live animals	13	12
03	Fish and crustaceans	31	6
05	Products of animal origin, not elsewhere specified or included	3	40
06	Live trees and other plants; bulbs, roots and the like; cut flowers	1	40
07	Edible vegetables and certain roots and tubers	3	1
08	Edible fruit and nuts; peel of citrus fruits or melons	1	1
09	Coffee, tea, maté and spices	5	1
10	Cereals	19	4
11	Products of the milling industry; malt; starches; inulin; wheat gluten	7	7
12	Oil seeds and oleaginous fruits	19	79
13	Lac; gums, resins and other vegetable saps and extracts	10	5
14	Vegetable plaiting materials; vegetable products nes	2	13
15	Animal or vegetable fats and oils; prepared edible fats; waxes	3	8
18	Cocoa and cocoa preparations	10	19
23	Residues from the food industries	19	5
24	Tobacco and manufactured tobacco substitutes	2	10
25	Salt; sulphur; earths and stone	67	15
26	Ores, slag and ash	97	12
27	Mineral fuels, oils and products	54	17
28	Inorganic chemicals	30	23
31	Fertilizers	23	58
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments	1	58
38	Miscellaneous chemical products	1	58
39	Plastics and articles thereof	4	52
40	Rubber and articles thereof	3	4
41	Raw hides and skins	60	34
43	Furskins and artificial fur; manufactures thereof	1	34
44	Wood and articles thereof	124	48
47	Pulp of wood	19	17
68	Articles of stone, plaster, cement, asbestos, mica or similar materials	2	5
71	Pearls, precious stones and metals	58	5
72	Iron and steel	189	22
73	Articles of iron or steel	1	22
74	Copper and articles thereof	136	17
75	Nickel and articles thereof	24	13
76	Aluminium and articles thereof	25	17
78	Lead and articles thereof	32	19
79	Zinc and articles thereof	36	13
80	Tin and articles thereof	18	16
81	Other base metals	101	17
85	Electrical machinery and equipment and parts thereof	3	18
86	Railway or tramway locomotives, rolling-stock and parts thereof	1	18

Note: The tables is based on the dataset including 20 tax imposing exporting countries at general rate.