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Who profits from trade facilitation initiatives?

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UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

Who Profits from Trade Facilitation Initiatives?

Bernard Hoekman and

Ben Shepherd

ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

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ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

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Who Profits From Trade Facilitation Initiatives?

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Abstract: Extensive research has demonstrated the existence of large potential welfare gains from trade facilitation—measures to reduce the overall costs of the international movement of goods. From an equity perspective an important question is how those benefits are distributed across and within nations. After discussing the possible impacts of trade facilitation, we use firm-level data for a wide variety of developing countries to investigate whether it is mostly large firms that benefit from trade facilitation. We find that firms of all sizes export more in response to improved trade facilitation. Our results suggest that trade facilitation can be beneficial in a range of countries, including those that are primarily involved in value chains as suppliers.

JEL Classification: F13; F14; O24

Keywords: Trade facilitation; trade costs; WTO; firm-level data; developing countries; global value chains; supply chains.

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Introduction

The term "trade facilitation" has a variety of context-dependent meanings. At the WTO, it refers primarily to the reform of border management processes designed to make import and export transactions easier, thus reducing the cost of trade. In other fora, such as the Asia Pacific Economic Cooperation (APEC), it refers to a broader set of policies that may have an impact on trade costs – e.g., including policy measures that affect the efficiency of transport and logistics services. This second meaning encompasses the WTO focus but goes much beyond it. In this paper we take a broad view of trade facilitation as including any policy action—including streamlining of border management processes—that tends to reduce international trade costs. Trade costs in turn refer to the full range of factors that drive a wedge between export and import prices. Trade facilitation can therefore be seen as the "technology" of international trade—the set of policies and procedures that makes it possible for exporters and importers to engage in mutually beneficial transactions and that defines the total cost of getting a good from one country into another.

Extensive empirical evidence, some of which is discussed in Section 2, suggests that trade facilitation can give a significant boost to bilateral trade, export diversification, and economic welfare. Although most papers focus on quantifying the benefits of trade facilitation, those that also take into account the investment dimension uniformly find that although the up-front costs can be substantial, they are significantly outweighed by the benefits.[1] Trade facilitation is therefore a "good deal" for countries. Although trade facilitation can be expected to have a significant net benefit for reforming countries in aggregate terms, there is a question as to how those gains are distributed, especially in the context of global value chains (GVCs) that may be dominated by large "lead" firms that are headquartered in developed nations. One possibility is that all firms in the value chain gain from better trade facilitation, because lead firms and their suppliers are all able to operate with lower costs and overall turnover expands. Another possibility that has been discussed in the literature, however, is that the gains from trade cost reductions are appropriated as rents by lead firms, because these firms have market power and/or suppliers are locked into dealing with specific lead firms. The result is that large/lead firms capture most of the gains, and workers in (owners of) supplying firms do not share in the benefits.[2] A variant of this argument that has been put

[1] As discussed below, here much depends on how broadly the concept of trade facilitation is defined and in particular whether it includes transport infrastructure.

[2] See e.g., Milberg and Winkler (2010), Barrientos et al. (2011), Berhardt and Milberg (2011), and Gereffi (2013). Mayer and Milberg (2013) make a similar argument in discussing the effects of Aid for Trade. While these strands

forward in the WTO negotiations on trade facilitation is that developing countries may not benefit from trade facilitation initiatives if they are large net importers. One way such concerns have been articulated by some developing country negotiators is to note that trade balances for developing countries are often in deficit, and to infer from this that lower trade costs will expand imports more than exports, thus worsening the initial imbalance (South Centre, 2011; ICTSD, 2012). This is a misconceived concern, because the overall balance of payments is not determined by trade costs but by macroeconomic variables (the savings-investment balance). Thus a reduction in trade costs cannot worsen the trade balance.[3] However, the concern could be understood in rent capture terms: that in countries that are large net importers the savings from trade facilitation are not passed on to domestic consumers and importing firms but are captured by the (foreign) firms – whether lead firms in GVCs or specialized international distributors – that are the source of the imports.

Arguments that large multinational firms – and thus, implicitly, developed countries – will capture most of the benefits from trade facilitation depend on there being a lack of competition among such firms, or at least that suppliers face substantial switching costs that effectively make it impossible to deal with other GVCs in the same sector. It is an empirical question whether all of the firms in a GVC will benefit. If most of the gains from better trade facilitation are appropriated by lead firms, we would expect to see that reflected in firm-level data. Specifically, we would expect to see that better trade facilitation is an important determinant of export behavior for large firms, but not for small ones. This paper contributes to the trade facilitation literature by testing that hypothesis with firm-level data for a wide range of developing countries, sourced from the World Bank's Enterprise Surveys project.

Although there is some variation in results according to sector, our general findings suggest that the gains from trade facilitation accrue to large and small firms alike: all size classes of firms export more in response to improved trade facilitation. There is limited evidence that small firms may not experience substantial gains from trade facilitation in the garments sector, but the data are relatively weak on this point, and the finding is not repeated in other sectors, or when the data are pooled across all sectors. Our findings therefore contribute to the policy debate on the distribution of the benefits of trade facilitation, as well as to the

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of the research literature focus on the distributional impacts of GVCs and not specifically on the effects of trade facilitation, GVCs are directly impacted by any reduction in trade costs.

[3] A reading of the way the balance of payments concerns have been raised in the WTO discussions suggest that the cause of the confusion is in part due to a misreading of the results in the literature on the effects of trade facilitation. Influential papers by Wilson et al. (2003; 2005) report results from gravity regressions in terms of estimated increases in a country's exports and its imports. If a country imports much more from a partner than it exports, trade facilitation measures will have a greater effect on the volume of imports than on exports. But this does not mean the overall balance of trade will be affected as the type of methodology used in these studies ignores the overall balance-of-payments financing constraint.

emerging firm-level literature on the export effects of improved trade facilitation (e.g., Shepherd, 2013).

Against this background, the paper proceeds as follows. Section 2 reviews the empirical evidence on the benefits and costs of trade facilitation. In Section 3, we examine trade facilitation from the point of view of firms involved in GVCs. Section 4 presents our dataset and empirical results. Section 5 concludes, and discusses the policy implications of our findings.

1. Benefits and costs of trade facilitation

Most published work on trade facilitation—whether using the narrow or broad definition—focuses exclusively on the benefits. Only a relatively small number of papers also consider the upfront investment costs that may need to be incurred to obtain any benefits. However, the finding from this literature is clear and consistent: the benefits of trade facilitation far outweigh the costs, which means that improving trade facilitation is well worth the initial investment costs it implies. It follows from this finding that there is also a strong case for providing aid resources to deal with these up-front costs: the published research on the effectiveness of aid for trade facilitation shows that it has a strongly trade-promoting effect (Cali and te Velde, 2011; Helble et al., 2012). In this section, we review some of the literature in this area, starting with contributions that assess the benefits of trade facilitation, and then moving to the small number of papers that also consider costs.

1.1. Evidence on the benefits of trade facilitation

The mechanisms by which trade facilitation can promote economic gains are well known. Taking the broad definition—in which trade facilitation is any policy action that reduces trade costs—shows that the key lies in an understanding of the factors that impede bilateral trade. Trade costs drive a wedge between export and import prices. As a result of this wedge, producers export less than they would in a world with lower trade costs, and consumers purchase less of each traded product, as well as a narrower range of products, than they otherwise would. Trade facilitation, which reduces the size of this wedge, therefore brings producers and consumers in different countries into closer contact, and tends to increase producer surplus in exporting countries, and consumer surplus in importing countries. Trade facilitation supports the process of economic integration through trade, which can, under appropriate circumstances, lead to rising national incomes, faster productivity growth, and poverty reduction.

There are two types of empirical evidence showing that improved trade facilitation can have significant economic benefits, econometric analyses and computable general equilibrium models. Econometric analyses use different measures of trade facilitation, with many of the more recent papers using either the World Bank's *Doing Business* database or the World Bank's Logistics Performance Indicators (Arvis et al. 2012). Much of the econometric research employs gravity regression models. A representative example is Djankov Freund

and Pham (2010) who use export time as measured by the World Bank's Doing Business project as an indicator of national trade facilitation performance. This measure includes document preparation, inland transit, passage through customs and other border agencies, and port and terminal handling. It therefore captures a number of important elements of trade facilitation in both the broad and narrow senses. They estimate a gravity model for 98 countries in which the dependent variable is the value of bilateral trade. In addition to standard gravity model control variables, they include the Doing Business time to export measure. They find that it is a significant determinant of bilateral trade flows. Concretely, an extra day's delay is associated with a reduction in bilateral trade of at least 1%.

Research of this type has been undertaken by numerous authors all of whom arrive at similar conclusions: trade facilitation (and lack of trade facilitation) matters importantly as a determinant of overall trade costs and is likely to have a larger impact on trade flows than import tariffs.[4] A particularly careful and detailed recent analysis of the potential impacts of what is on the table in the WTO trade facilitation talks – which as mentioned does not include infrastructure and related services – by Moïsé and Sorescu (2013), based on a comprehensive new dataset of trade facilitation indicators (Moïsé, Orliac and Minor, 2012) estimates that implementing the various elements of what has been proposed in the Doha Round would lower developing country trade costs by around 14%.

Saslavsky and Shepherd (2012) provide complementary evidence specific to the case of GVCs. Using a gravity model with trade in machinery parts and components as a proxy for goods traded within GVCs and using the World Bank's Logistics Performance Indicators, they find that intra-GVC trade is more sensitive to improvements in logistics performance—another important aspect of trade facilitation—than trade in other types of goods. Indeed, the link between logistics performance (trade facilitation) and trade in GVC products is about 50% stronger than for other goods. Trade facilitation is thus particularly important in the case of GVCs.

This type of research shows that improved trade facilitation has strong potential to boost trade, benefiting producers and consumers alike. However, the gravity model approach limits the assessment to one of the likely trade effects of improvements; it does not allow a direct assessment of economic welfare (real income) effects. Although more trade does not directly translate into improvements in economic welfare, reductions in trade costs do insofar as such costs are "wasteful" and do not generate rents. Trade facilitation to some extent involves the elimination of resource waste – e.g., duplicative procedural requirements and paperwork – in contrast to trade liberalization (e.g., lowering tariffs), which mainly reallocates

[4] See e.g., Wilson et al. (2003; 2005), Hoekman and Nicita (2010; 2011), Martinez-Zarzoso and Marquez-Ramos (2008).

resources and in the process generates efficiency gains. Trade facilitation lowers costs and hence prices, both to consumers and to firms that import production inputs, and therefore increases real disposable incomes and/or profits. Moreover, firms and consumers may gain access to a wider variety of goods as the fixed costs of getting products into the market fall.

Computable general equilibrium models of the world economy pick up these effects. While they only provide a rough sense of the orders of magnitude involved because there is little information of the extent to which trade facilitation measures will reduce waste, the extant models generally suggest that the economy-wide gains from trade facilitation can be very substantial. Francois et al. (2005) conclude that the national income effects from improved trade facilitation can be up to twice or three times as large as those that result from removing all tariffs globally on manufactured goods. A more recent CGE-based analysis, WEF (2013), incorporates econometric estimates of the impacts of a number of specific trade facilitation-related variables, and concludes that if countries pursue ambitious improvements in trade facilitation the ratio could be on the order of five or more. Concerted action to raise the average trade facilitation performance of countries to halfway the level of best practice (defined by Singapore) could increase global GDP by almost 5%, six times more than would result from removing all remaining import tariffs.[5] Of course, achieving trade facilitation improvements will require investments, while tariff reductions require only the stroke of a pen. However, many of the barriers that are modeled in WEF (2013) can be traced to policy and regulatory measures that will not require significant investment to reform/improve.

In addition to boosting bilateral trade—particularly trade taking place within GVCs— and increasing national income, trade facilitation can also contribute to the important development policy aim of export diversification. Moving along the extensive margin of trade is important for developing countries: selling goods in which a comparative advantage exists to additional countries, and entering into the production of new types of products. Both dimensions of diversification are part and parcel of GVC participation and are likely to be facilitated through such participation. The reason is that GVCs allow firms to specialize in narrow activities and tasks in which they are competitive. Trade facilitation helps in entering and exploiting such niches by lowering the fixed costs of participation in international trade (GVCs). Such costs are particularly important barriers to internationalization for small companies which are of course particularly prevalent in developing countries (Baldwin, 2012).

Dennis and Shepherd (2011) show that improving trade facilitation helps promote export diversification by making it easier for countries to export “new” products, in the sense of

[5] The focus of the WEF (2013) analysis is on the impact of two trade facilitation measures: border management (customs clearance and other regulatory requirements and processes that pertain to goods entering or leaving a country) and transport and communications infrastructure services.

products they currently do not export. Their modeling approach is not based on a gravity formulation, although the variables included are quite similar, in that the dependent variable is the number of eight-digit products a country exports to the EU (taken as a representative developed country market). Using a sample of 118 developing countries, Dennis and Shepherd (2011) find that a 10% reduction in the costs associated with the aspects of trade facilitation considered by Djankov, Freund and Pham (2010) is associated with a 3% increase in the number of products exported. Trade facilitation therefore not only promotes greater bilateral trade between countries, but also makes it easier for developing countries to export a wider range of products—which is an important development goal.

1.2. Evidence on the benefit-cost balance of trade facilitation

The papers discussed in the previous section only deal with the benefits of trade facilitation. In this subsection, we consider contributions that assess both the benefits and costs. We first consider two examples from the gravity model literature, before turning to an additional contribution that examines the costs and benefits of trade facilitation in general equilibrium, from a welfare standpoint.

Gravity models can be combined with a project costing model to analyze the benefits and costs of specific types of trade facilitation improvement such as road quality upgrading. Buys et al. (2010) do this for the case of Sub-Saharan Africa, and Shepherd and Wilson (2007) for the case of Europe and Central Asia. Both papers find the expected trade gains from improved road connectivity quickly dwarf the initial investment costs, even though the latter can be substantial, especially in Africa. Buys et al. (2010) find that road upgrading could expand overland trade among Sub-Saharan African countries by up to $250bn over 15 years. Using a World Bank road costing model based on extensive data from previous road projects, they estimate that the initial investment cost would be of the order of $20bn, and that an additional $1bn would be required annually for maintenance. There is thus a strong net benefit from trade facilitation by improving road connectivity, even once substantial upgrading costs are accounted for.

Mirza (2009) takes a general equilibrium approach to assessing the costs and benefits of trade facilitation. She contributes to the literature in two main ways. First, she includes a capital goods sector in the economy, which produces trade-related infrastructure. This innovation means that investment carries an opportunity cost, i.e., the resources could be productively used elsewhere in the economy. Second, she includes data and parameters in the model to characterize border efficiency across countries, and its impact on trade. The

basis for this approach is the World Bank's Logistics Performance Index. Econometric models make it possible to estimate a relationship between logistics performance and the estimated stock of trade-related capital, and between logistics performance and trade. Putting these various elements together provides a general equilibrium setting for analyzing the costs and benefits of trade facilitation.

Against this background, Mirza (2009) finds that there is a strong net benefit from trade facilitation in economic welfare terms, even when the initial investment costs are netted out. Concretely, an improvement of about 1% in Sub-Saharan Africa's logistics performance requires an up-front investment of around $18bn. The estimated welfare gains from this improvement are much larger, on the order of $70bn. The benefit-cost balance is therefore strongly positive even in a general equilibrium setting. This result reinforces the narrower findings of Buys et al. (2010), and Shepherd and Wilson (2007).

More generally, the *net* returns of trade facilitation measures will be a function of how trade facilitation is defined. Under the WTO it will mostly involve border management process-related measures such as the use of information technology; risk assessment; etc. that do not involve a need for major investment in infrastructure. Estimates of the likely costs of implementing a WTO agreement are much lower than the costs associated with transport infrastructure upgrading and are expected to be in the US$5-20 million range depending on initial conditions (McLinden, 2011; OECD, 2012). Many types of trade facilitation initiatives are low cost to implement. The fact that assessments that consider major investments in hard infrastructure conclude that the net return is positive and substantial in magnitude therefore suggests that the conclusion that there are large payoffs to trade facilitation is robust.

2. Distributional concerns and questions

The papers on costs and benefits of trade facilitation reviewed above take a "macro" perspective. They are interested in overall impacts on the volume of trade of changes in trade costs, or in overall welfare changes, compared with the total costs of improving trade facilitation. They do not deal with distributional issues, i.e., how the net benefits are allocated across different groups in society or across different countries. The presumption in most CGE models is that there is a "representative" consumer who benefits from lower costs and greater variety. These models distinguish between sectors of the economy and do not have firm-level detail. This is also the case for gravity models, which center on products. Gravity models that use trade data therefore also do not allow for an assessment of the incidence of cost reductions on firms – the analysis focuses only on the trade effects of lower trade costs.

Inefficient logistics and border management will be reflected in higher trade costs and policy measures such as trade facilitation should result in connecting firms and communities more closely to world markets, reducing the difference between domestic and world prices. But prevailing market structures, including market power in downstream segments of the production/value chain may affect the distribution of the benefits of trade facilitation by allowing some firms to capture the benefits as rents, with no consequent impact on prices.[6] Alternatively, the appropriation of trade facilitation improvements as rents by lead firms would prevent them from bringing benefits to upstream firms (small suppliers) and those directly involved in the performance of such firms (workers).[7]

In light of the rise of GVCs in numerous sectors involving a wide range of countries, the distributional question is an important one. Recent analysis of trade in value added has shown that a large share of the value that is embodied in a traded good reflects a variety of services inputs. These range from the value of the knowledge and research and development that led to the design of the product to the value generated by ownership of the brand under which a product is marketed to consumers. The value of the labor and processing tasks that is needed for the assembly of the product, especially if this spans different stages spread out over a number of countries, is often only a small share of the total. The same is true for agricultural GVCs. The structure of GVCs often is centered around a lead firm, which may be located at the downstream end of a chain, as is the case with a large retailer or supermarket chain, or at the upstream end of the chain, as would be the

[6] See for example Sexton et al. (2007), and Porto et al. (2011).
[7] Mayer and Milberg (2013) make essentially this argument in the case of Aid for Trade measures that are designed to lower trade costs.

case in high-tech products where most of the value is generated by the design and technology that defines the utility of what is being offered to buyers/consumers (e.g., aircraft, smartphones). Whatever the specifics of the product and the structure of the relevant GVC, the firms that drive and manage the associated production network will generally be much larger than their suppliers and are likely to have some market (price-setting) power vis-à-vis their suppliers and partners. If so, they might be able to take at least a portion of the gains from trade facilitation initiatives as rents, thus depriving consumers/suppliers of expected welfare/profit gains.

Of particular interest (concern) then is whether it is primarily the large multinational (lead) firms that (will) benefit from reductions in trade costs in developing countries following improved trade facilitation. Monopoly power of providers of inputs and/or monopsony power on the part of buyers (trading companies; retailers) can lower domestic farm/factory gate prices and/or may result in retail prices that are higher than they would be if the relevant markets were characterized by greater competition. The crucial question here is whether and how much market power firms have and whether they use it to extract rents. The degree of market power in turn depends importantly on the extent of competition *between* value chains within the same sector. It is only if suppliers are locked into dealing with a single lead firm that the distributional argument has real force.[8] There is, in fact, very little empirical evidence on this point, although its importance is recognized in the literature on value chains (e.g., Mayer and Milberg, 2013).

Significant policy attention has been given to the question whether changing market structures and the rise of GVCs give rise to competition concerns because of excessive concentration/market power in certain parts of the supply chain—especially "buyer power" by retailers. A particular focus in this regard has been on the operation of markets for foodstuffs and agricultural produce. In the late 2000s, European national competition agencies investigated the prevalence and extent of imperfect competition in the food supply chain. Despite high concentration ratios at the retail level in many countries, the degree of competition was found to be intense, and no national competition authority saw a need for (or had taken) action against retailers for taking part in horizontal anti-competitive agreements or engaging in abuse of dominance (EU, 2009).[9]

While large retailers (supermarkets) may have buying power, so too do major multinational food companies with strong brands. Insofar as retailers use their market power to bargain for

[8] Lock-in effects may arise be because of a lack of competition among lead firms or because suppliers incur significant sunk costs due to a need to invest in GVC specific facilities and processes.
[9] EU (2009) notes that in 2006, the average net profit margins of European retailers were around 4% as compared to margins for The Coca-Cola Company and Group Danone of some 20% and 11%, respectively.

better prices from suppliers that also have market power (the multinationals), the battle is over the distribution of rents.[10] Market power at any stage of the value chain can be expected to affect the distribution of the rents that accrue to the agents that are involved in the chain. Thus, buyer power by retailers can be used to extract any rents from upstream producers –be they multinationals, wholesalers or farmers in developing countries. However, while such rent shifting/extraction may motivate actions by either the upstream producers or the government to affect their distribution, from a global welfare perspective what matters is whether the end result of the interaction between the firms in a given GVC results in higher consumer retail prices. If the effect is to lower final prices, there is not a problem from a consumer welfare and efficiency perspective—to the contrary. The same reasoning applies in the trade facilitation context.

In many developing countries, suppliers are small firms or smallholder farmers who depend on a small number of buyers that have market power (oligopsony) and are thus able to extract some of the surplus that the export market generates. Porto et al. (2011) find that greater competition among processors in a sample of African countries and export crops would benefit farmers by increasing farm gate prices. Similarly, Improvements in rural infrastructure—which is a type of trade facilitation—improves the incomes of agricultural smallholders, at the same time as reducing prices for consumers. Matters are complicated however by the fact that buyers often also provide ancillary services and working capital (e.g., seeds). Pervasive market failures such as lack of access to credit mean that in practice processors may provide inputs to farmers in return for agreement to buy their harvest at a negotiated price. Given weak capacity to enforce contracts through the legal system, the feasibility of such arrangements may depend on the buyers having some market power. Porto et al. (2011) conclude that if such constraints (market failures) are taken into account, the benefits of greater competition are reduced, but the reductions relative to a benchmark without market failures are generally small.

Trade facilitation should help increase competitive forces; whatever the case may be in the context of a specific GVC with respect to efforts by a lead firm or distributors to extract the rents from trade facilitation efforts, trade facilitation initiatives will lower actual costs of trade and thus reduce the barriers to entry by new firms and the cost of switching to alternative GVCs. On the margin therefore trade facilitation should result in *all* firms in a GVC benefiting. That said, if switching and search costs are substantial, the benefits of trade facilitation may be distributed in a skewed fashion, with small suppliers seeing less in the way of gains than

[10] The type of bilateral bargaining that occurs between large retailers and large producers of processed foods (multinationals) is unlikely to reduce output – in fact it may increase it by inducing suppliers to compensate for lower prices by producing more (OECD, 2008).

they would in a perfectly competitive market. At the end of the day the issue is an empirical one, and there is as yet very little evidence on it. Mayer and Milberg (2013) criticize the available quantitative evidence on the basis that it generally looks at trade effects at the level of country aggregates, and it is therefore impossible to see what is happening at the level of individual firms. There are also obvious limitations of a qualitative approach in terms of sample selection, omitted variables, and attribution (causation), but Mayer and Milberg (2013) argue that the available case study evidence on Aid for Trade—which is often centers in part on trade facilitation—suggests that benefits accrue to workers in cases when aid is targeted directly at them, rather than at the whole value chain.

In the remainder of this paper, we seek to provide additional empirical clarity on these points by using a firm-level quantitative approach.

3. Empirical evidence: do small firms win too?

This section uses firm-level data to assess whether or not the impact of trade facilitation reforms depends on firm size. The first subsection discusses our dataset. The second presents our empirical model and results.

3.1. Data

Table 1 provides a full list of variables and definitions used in the empirical analysis. Descriptive statistics are in Table 2. All data are sourced from the World Bank's Enterprise Surveys. That project now covers over 130,000 firms in 135 countries. We use the current standardized version of the dataset (as at March 3, 2013), which includes data for firms in 119 developing countries and 11 manufacturing sectors over the period 2006-2011.

Various units of the World Bank have been conducting firm-level surveys since 2002. Since 2005-2006, those efforts have been centralized in the Enterprise Surveys project. Although country-specific survey instruments are used, responses are also matched to a standardized questionnaire, and the data are made available in a comparable format, free of charge, on the World Bank website (www.enterprisesurveys.org). The World Bank does not conduct the surveys itself, but instead uses private contractors. The identity of survey respondents is kept confidential, due to the sensitive nature of much of the data collected. Each survey typically covers one year of data, but for some key variables—such as sales and employment—firms are asked to provide data for the last fiscal year, and three fiscal years ago. However, even when countries appear more than once in the dataset—as is frequently the case—it is not possible to create a true firm level panel, because anonymous firm identifiers are year specific, which makes it impossible to identify whether a particular firm has been interviewed more than once. The dataset therefore consists of a sample of firms for each country-year in which a survey is administered. The dimensionality of the dataset is important when it comes to using fixed effects in the regression analysis below.

Typically, business owners and top managers are the survey respondents. Sometimes, they call in company accountants and human resource officers to assist. The sampling procedure is carefully controlled. Stratified random sampling is applied, with strata corresponding to firm size category, business sector, and geographical region within a country.

Surveys only sample firms in the formal sector with at least five employees. In the developing country context, they therefore probably over-sample larger firms to some extent: 28% of the dataset is made up of micro-firms, 42% consists of small firms, 22% consists of medium firms, and the remainder (8%) is made up of large firms.[11] The sampling frame is derived whenever possible from the universe of eligible firms as determined by the country's statistical office. In other cases, the list of firms is obtained from tax agencies or business licensing authorities. Alternatively, business associations or marketing databases are used. In a few cases, the World Bank manually constructs the firm list after partitioning a country's major economic cities into clusters and blocks, and then randomly selecting a subset of blocks to be enumerated.

Data quality is clearly an issue for the Enterprise Surveys data, since they are collected by private contractors with no enforcement power in the case of misstatement, a contrast with the situation when firm-level surveys are conducted by national authorities. Two aspects of the data suggest that they are of sufficient quality for use in the present case, however. First, the Enterprise Surveys data or similar World Bank firm-level surveys have been widely used in published work as they represent the best available data for many developing countries; analysis using other data is simply not feasible. Examples of well-known and widely-cited papers using these data—either the Enterprise Surveys themselves, or their previous versions at the World Bank—include: Svensson (2003); Beck et al. (2004); Van Biesebroeck (2005); Dollar et al. (2006); Fisman and Svensson (2007); and Djankov et al. (2010). Shepherd (2013) uses the Enterprise Surveys data to assess the impact of trade facilitation on export performance at the firm-level, which is the same use to which the data are put here.

In addition to being widely used in published work, the data are cleaned by taking advantage of the survey administrator's response to two questions: whether or not the questions in the survey relating to opinions and perceptions were answered truthfully or somewhat truthfully; and whether or not the questions regarding figures were taken directly from establishment records or were estimates computed with some precision. Firms not satisfying either of these two criteria are dropped from the analysis.

[11] Firm categories are defined as follows: micro, less than 10 employees; small, between 10 and 50 employees; medium, between 50 and 250 employees; and large, greater than 250 employees.

3.2. Empirical model and results

If it is the case that only large firms benefit from trade facilitation, we would expect to see that contention reflected in firm-level data. Specifically, we would expect to see that an indicator of trade facilitation—such as the time it takes firms to export goods—would only be negatively associated with export performance, as in Shepherd (2013), for large firms, not small ones.

To examine whether or not this is in fact the case, we follow the same general approach as Shepherd (2013). We add interaction terms between our indicator of trade facilitation performance—average time to export,[12] as reported by each firm—and firm size, as proxied by dummy variables for micro, small, and medium enterprises. Large firms make up the excluded category. To properly specify such an interaction model, we also need to include the same dummies for firm size independently in the estimating equation. We therefore drop the logarithm of the number of employees, which is the variable Shepherd (2013) uses to capture firm size in his regressions.

This approach gives the following basic estimating equation:

$$(1)\ \%\ \text{Direct Exports} = \sum_{c}\sum_{s}\sum_{t} d_{cst} + b_0 \log(Export\ Time_{fcst}) + b_1 \log\left(Export\ Time_{fcst}\right) * Micro + b_2 \log\left(Export\ Time_{fcst}\right) * Small + b_3 \log\left(Export\ Time_{fcst}\right) * Medium + b_4 Micro + b_5 Small + b_6 Medium + \sum_{i=7} b_i Controls_{fcst} + e_{fcst}$$

where: export time is the average number of days taken for direct exports between arrival at the main point of exit and clearance by customs, as reported by each firm; micro, small, and medium are firm size category dummies; controls refers to a set of firm-level control variables; and d represents a full set of fixed effects in the country-sector-year dimension. The dependent variable is the percentage of firm sales that is directly exported (without a distributor). Because it is bounded between zero and unity, OLS estimation is biased. We therefore use the fractional logit estimator (Papke and Wooldridge, 1996), which is specifically designed for this type of dependent variable.

To give a first idea of the correlations in the data, we initially estimate the model without any additional controls (Table 3, column 1). Average export time has a negative and statistically

[12] "Export time" is defined as the average number of days taken for direct exports between arrival at the main point of exit and clearance by customs (Table 1).

significant (1%) coefficient, which is in line with expectations and the previous results of Shepherd (2013). Large firms are the excluded category from the regression, so the interpretation of this result is that for large firms, better trade facilitation—shorter export time—is associated with a greater proportion of sales being exported. To see whether this effect also holds true for smaller firms, we need to analyze the interaction terms that follow. In all three cases—micro, small, and medium firms—the interaction terms have statistically insignificant coefficients. This finding means that better trade facilitation has the same impact for smaller firms as it does for large ones: it improves export performance. Results of this first regression therefore tend to go against the contention that trade facilitation only benefits large firms.

Column 2 re-runs the same regression with a number of firm-level controls. We include capital intensity, the capacity utilization ratio (as a proxy for management competence), and dummies for majority foreign ownership and ISO-9000 certification. This specification is identical to the one in Shepherd (2013), except that, as previously noted, size dummies are used instead of the number of employees. Results for the trade facilitation variables remain substantially unchanged: the coefficient on average export time is negative and 1% statistically significant, and none of the interaction terms have a statistically significant coefficient. With the exception of the foreign ownership dummy—which has a positive and 1% statistically significant coefficient—the control variables do not exhibit a statistically significant association with export performance.

To investigate the issue further, we split the data into subsamples according to sector. In these specifications (Table 3, columns 3-5) we replace the country-sector-year fixed effects with country-year fixed effects, because each regression only covers a single sector. We choose three sectors in which GVCs are particularly prevalent, and where the size contention may therefore play out differently than in the full sample: garments, food, and electronics. We rerun the regression from column 1—i.e., excluding firm-level controls—for each sector separately. We do not include the additional firm level controls from column 2 in order to preserve sample size, which is very small in electronics; in any event, results from column 2 show that addition of the control variables does not substantially change our results on trade facilitation.

Results show some degree of variability according to sector. Interestingly, export time has a coefficient that is considerably larger in absolute value than in the full sample regression for garments, and especially electronics. This result lines up well with findings from the cross-country (gravity model) literature, which show that the kinds of goods traded within GVCs

tend to be more sensitive to improvements in trade facilitation than other types of goods (Saslavsky and Shepherd, 2012).

Taking garments (column 3), we see that two of the three interaction terms are statistically insignificant. Only the coefficient of the interaction term with the dummy for small firms is positive and statistically significant. This finding suggests that trade facilitation has the same impact for all categories of firms except small ones, for which it is significantly attenuated. This result lines up with the contention that trade facilitation matters more for larger firms, but from that point of view, it is strange not to see micro and medium enterprises affected in the same way as small ones. Given this inconsistency and the relatively low number of observations for a firm-level data set, we conclude that results for the garments sector only provide weak evidence in favor of the contention that small firms do not benefit from trade facilitation.

Results for food (column 4) show that export time is not a significant determinant of export performance for firms of any size. This surprising result is perhaps due to the fact that the Enterprise Surveys data probably do not capture much of the kind of new agricultural exporting activity that is driving growth of agrifood GVCs. On the one hand, the survey only includes firms, not farmers, who typically do not have any formal business entity in the developing world. Second, for many countries, horticultural goods and niche products like cut flowers—which are in fact highly perishable and therefore are likely to depend strongly on trade facilitation for their export performance—are not a significant part of the export bundle, and so probably are only marginally sampled in the Enterprise Surveys data.

In electronics (column 5), as in the pooled model, none of the interaction terms are statistically significant. This finding means that for the best known GVC sector, trade facilitation has the same effect for firms of all sizes. Although the sample is very small, we would expect to see significant differences in this case because it is an area in which GVCs are particularly well developed. Results show, however, that there is no evidence in the case of electronics that trade facilitation is only a significant determinant of export performance for large companies.

4. Conclusion and policy implications

Whether we are talking about trade facilitation in the broad sense of reducing trade costs or in the WTO sense of streamlining border procedures, the empirical evidence from econometric studies and CGE models is overwhelming: improvements have the potential to bring major economic gains in terms of increased trade and real incomes. Moreover, the available evidence—although scant—suggests that even when the sometimes significant upfront costs of trade facilitation are netted out, the benefit-cost balance is strongly positive. In a global sense, trade facilitation is a "good deal" for countries, in that it has the potential to bring economic benefits at least on a par with, and perhaps well in excess of, those that would come from a major round of tariff cuts in manufacturing.

However, from a negotiating standpoint, as well from the point of view of development policy, it is not just the global economic gains that matter, but also their distribution. Two questions are important. First, is it primarily developed countries that stand to reap significant gains from improved trade facilitation, or will developing countries also gain? Second, and tied to the first, in the context of GVCs, is it only large firms (mostly headquartered in developed countries) that benefit from trade facilitation, to the exclusion of small suppliers (mostly located in developing countries)? On the first question, the available empirical evidence suggests that developing and developed countries both stand to gain from improved trade facilitation. In particular, exports are expected to increase for both country groups. Some parties have raised concerns that developing country imports might, however, increase more rapidly than exports, thereby causing balance of payments problems for developing countries. However, there is no economic basis for believing that this would be the case. The balance of payments is determined by macroeconomic forces within a country, most fundamentally the ratio of savings to investment. Trade policy of any type—be it tariffs or trade facilitation—plays almost no role in the determination of the balance of payments, except in the very short term while macroeconomic variables like the exchange rate are adjusting. Developing countries can therefore feel reasonably certain that they stand to reap real economic gains from improved trade facilitation, partly through increased exports, partly through cheaper access to imported intermediate goods that are used by their own producers and exporters and partly through a reduction in socially wasteful activity that lowers the costs of trade goods and increases real incomes.

This paper has focused more particularly on the second question, since it is empirical in nature, but has not been subject to any rigorous testing. For the contention that trade facilitation only benefits large, mostly foreign owned firms to hold in the GVC context, one of

two conditions must be met. One possibility is that there is a lack of competition between value chains, such that lead firms act as oligopsonists with respect to suppliers, and are thus able to appropriate the potential trade facilitation gains as rents. An alternative problem could be that suppliers incur large sunk costs in adapting their production processes to the needs of one lead firm, and therefore cannot easily change. The result in the second case would be the same as in the first, and the lead firm would be able to appropriate at least part of the potential gains from trade facilitation as rents, rather than passing them on to other firms and consumers.

The contention that only large, lead firms benefit from trade facilitation is one that we would expect to see reflected in firm-level data if it is true. We have tested it here using a large dataset from a variety of developing countries, and have found no consistent evidence in its favor. Generally speaking, firms of all sizes benefit from improved trade facilitation by exporting more in response to improvements like reductions in the time taken to export goods. Although there are some differences in the data at a sectoral level, particularly for garments, our conclusion is that except under special circumstances that do not appear to hold in practice, small firms stand to benefit from trade facilitation through the same mechanism that large ones do. As a result, countries where small, supplier firms are prevalent and lead firms are few or nonexistent—which is the case for many developing countries—also stand to gain from improved trade facilitation.

In terms of policy, our results and review of the literature suggest two main conclusions. First, those interested in supporting small producers and exporters in developing countries—policymakers, researchers, and the development community—should actively support improved trade facilitation in developing countries. It flows from this that the same parties should welcome a WTO Agreement on Trade Facilitation.

Second, the arguments that have been put forward by some in the policy community as reasons for developing countries to be wary of the trade facilitation debate do not stand up to empirical scrutiny. On the one hand, the contention that improved trade facilitation may worsen balance of payments problems in some developing countries ignores the fact that it is macroeconomic factors (savings and investment) that determine the balance of payments, not trade policy. In addition, the fact that small firms can benefit in the same way as large firms from improved trade facilitation means that economies where supplier firms are prevalent but lead firms are not still stand to gain from trade facilitation reforms. Distributional issues are, of course, important to the political economy of trade negotiations, and to their development implications. But in this case, distributional concerns do not undermine the wealth of evidence showing that trade facilitation can boost trade and real

incomes across the globe, in countries at all levels of development. This is not to deny that gains from trade facilitation could be distributed unequally or that governments should monitor the impacts of trade facilitation initiatives. In this area – as more generally – it is important that reforms and projects are designed in a way that allows assessments of impacts over time.

References

Baldwin, R. 2012. "Global Supply Chains: Why They Emerged, Why They Matter, and Where They are Going." Discussion Paper 9103, CEPR.

Barrientos, S., F. Mayer, F., R. Pickles, and A. Posthuma. 2011. "Decent Work in Global Production Networks: Framing the Policy Debate." *International Labour Review*, 150(3-4): 297-317.

Beck, T., A. Demirguc-Kunt, and V. Maksimovic. 2004. "Bank Competition and Access to Finance: International Evidence." *Journal of Money, Credit, and Banking* 36(3): 627-648.

Bernhardt, T., and W. Milberg. 2011. "Economic and Social Upgrading in Global Value Chains: Analysis of Horticulture, Apparel, Tourism and Mobile Telephones." Working Paper, Capturing the Gains.

Buys, P., U. Deichmann, and D. Wheeler. 2010. "Road Network Upgrading and Overland Trade Expansion in Sub-Saharan Africa." *Journal of African Economies*, 19(3): 299-432.

Calì, M. and D. te Velde, 2011. "Does Aid for Trade Really Improve Trade Performance?" *World Development*, 39(5): 725-40.

Cattaneo, O., G. Gereffi, S. Miroudot, and D. Taglioni. 2013. "Joining, Upgrading and Being Competitive in Global Value Chains: A Strategic Framework." Policy Research Working Paper 6406, World Bank.

Coe, N. 2013. "Missing Links: Logistics, Governance and Upgrading in a Shifting Global Economy." *Review of International Political Economy*.

Dennis, A., and B. Shepherd. 2011. "Trade Facilitation and Export Diversification." *The World Economy*, 34(1): 101-122.

Djankov, D., C. Freund, and C. Pham. 2010. "Trading on Time." *Review of Economics and Statistics*, 92(1): 166-173.

Djankov, S., T. Ganser, C. McLiesh, R. Ramalho, and A. Shleifer. 2010. "The Effect of Corporate Taxes on Investment and Entrepreneurship." *American Economics Journal: Macroeconomics* 2(3): 31-64.

Dollar, D., M. Hallward-Driemeier, and T. Mengistae. 2006. "Investment Climate and International Integration." *World Development* 34(9): 1498-1516.

EU (Commission of the European Communities). 2009. "Competition in the Food Supply Chain." SEC(2009) 1449, Brussels.

Fisman, R., and J. Svensson. 2007. "Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence." *Journal of Development Economics* 83(1): 63-75.

Francois, J., H. Van Meijl, and F. Van Tongeren. 2005. "Trade Liberalization in the Doha Development Round." *Economic Policy*, 20(42): 349-391.

Gereffi, G. 2013. "Global Value Chains in a Post-Washington Consensus World." *Review of International Political Economy*

Helble, M., C. Mann, and J. Wilson. 2012. "Aid for Trade Facilitation." *Review of World Economics*, 148(2): 357-376.

Hoekman, B., and A. Nicita. 2011. "Trade Policy, Trade Costs and Developing Country Trade." *World Development,* 39(12): 2069-79.

Hoekman, B., and A. Nicita. 2010. “Assessing the Doha Round: Market Access, Transactions Costs and Aid for Trade Facilitation.” *Journal of International Trade & Economic Development,* 19(1): 65-80.

ICTSD. 2012. “’Signs of Momentum’ in WTO Doha Round Talks, Lamy Says.” Bridges Weekly Trade News Digest, 16(33), October 3.

Lee, J., G. Gereffi, and S. Barrientos. 2011. “Global Value Chains, Upgrading and Poverty Reduction.” Briefing Note 03, Capturing the Gains.

Mayer, F. and W. Milberg. 2013. “Aid for Trade in a World of Global Value Chains: Chain Power, The Distribution of Rents, and Implications for the Form of Aid,” Duke University working paper.

Martinez-Zarzoso, I., and L. Marquez-Ramos. 2008. “The Effect of Trade Facilitation on Sectoral Trade.” *The B.E. Journal of Economic Analysis & Policy*, 8(1): 42.

McLinden, G. 2011. “World Bank Gap Assessment Study.” Symposium on Practical Experience of Implementing Trade Facilitation Reforms, Including Their Costs and Benefits, Geneva (November). At http://www.wto.org/english/tratop_e/tradfa_e/case_studies_e/wb_pres_e.ppt.

Milberg, W., and D. Winkler. 2010. “Financialisation and the Dynamics of Offshoring in the USA,” *Cambridge Journal of Economics*, 34(2): 275-293.

Mirza, T. 2009. “Infrastructure and Trade in Sub-Saharan Africa.” GTAP Resource 3127, Purdue University.

Moïsé, E., and S. Sorescu. 2013. “Trade Facilitation Indicators: The Potential Impact of Trade Facilitation on Developing Countries' Trade.” Trade Policy Paper 144, OECD.

Moïsé, E., T. Orliac, and P. Minor, 2012. “Trade Facilitation Indicators: The Impact on Trade Costs.” Trade Policy Paper 118, OECD.

OECD. 2009. “Monopsony and Buyer Power.” DAF/COMP(2008)38 (December 17).

OECD. 2012. *The Costs and Challenges of Trade Facilitation Measures*. Paris: OECD.

Papke, L., and J. Wooldridge. 1996. “Econometric Methods for Fractional Response Variables with an Application to 401(k) Plan Participation Rates.” *Journal of Applied Econometrics*, 11(6): 619-632.

Porto, G., N. Chauvin, and M. Olarreaga. 2011. *Supply Chains in Export Agriculture, Competition and Poverty in Sub-Saharan Africa*. London: World Bank and CEPR.

Saslavsky, D., and B. Shepherd. 2012. “Facilitating International Production Networks: The Role of Trade Logistics.” Policy Research Working Paper 6224, World Bank.

Sexton, R., I. Sheldon, S. McCorriston, and H. Wang. 2007. “Agricultural Trade Liberalisation and Economic Development: The Role of Downstream Market Power.” *Agricultural Economics* 36: 253-70.

Shepherd, B. 2013. “Trade Times, Importing, and Exporting: Firm-Level Evidence.” *Applied Economics Letters*, 20(9): 879-883.

Shepherd, B., and J. Wilson. 2007. “Trade, Infrastructure, and Roadways in Europe and Central Asia: New Empirical Evidence.” *Journal of Economic Integration*, 22(4): 723-747.

South Centre. 2011. “Trade Facilitation State of Play and Implications of an ‘Early Harvest’ for Developing Countries.” Geneva: South Centre (May).

Svensson, J. 2003. “Who Must Pay Bribes and How Much? Evidence from a Cross-Section of Firms.” *Quarterly Journal of Economics* 118(1): 207-230.

Van Biesebroeck, J. 2005. “Exporting Raises Productivity in Sub-Saharan African Manufacturing Firms.” *Journal of International Economics* 67(2): 373-391.

Wilson, J., C. Mann, and T. Otsuki. 2003. “Trade Facilitation and Economic Development: A New Approach to Measuring the Impact.” *World Bank Economic Review*, 17(3): 367-389.

Wilson, J., C. Mann, and T. Otsuki, 2005. “Assessing the Benefits of Trade Facilitation: A Global Perspective." *The World Economy*, 28(6): 841-71.

Tables

Table 1: Variables, definitions, and sources

Variable	Definition	Year	Source
% Direct Exports	Percentage of an establishment's total sales accounted for by direct exports	Various	Enterprise Surveys question d3b
Foreign	Dummy variable equal to unity for establishments that are owned more than 50% by foreign private individuals, companies, or organizations	Various	Enterprise Surveys question b2b
Log(Capacity Utilization)	Logarithm of the establishment's current output in comparison with its maximum possible output over the last year	Various	Enterprise Surveys question f1
Log(Capital Intensity)	Logarithm of the net book value of total assets per permanent and temporary or seasonal full time employee	Various	Enterprise Surveys questions l1, l6, n6a, and n6b
Log(Export time)	Logarithm of the average number of days taken for direct exports between arrival at the main point of exit and clearance by customs	Various	Enterprise Surveys question d4
Medium	Dummy variable equal to unity for establishments with more than 50 but no more than 250 permanent and temporary or seasonal full time employees in the last fiscal year	Various	Enterprise Surveys questions l1 and l6
Micro	Dummy variable equal to unity for establishments with 10 or fewer permanent and temporary or seasonal full time employees in the last fiscal year	Various	Enterprise Surveys questions l1 and l6
Small	Dummy variable equal to unity for establishments with more than 10 but no more than 50 permanent and temporary or seasonal full time employees in the last fiscal year	Various	Enterprise Surveys questions l1 and l6

Table 2: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min.	Max.
% Direct Exports	36744	0.100	0.251	0	1
Foreign	36626	0.091	0.288	0	1
Log(Capacity Utilization)	30474	4.222	0.429	-0.693	4.654
Log(Capital Intensity)	23581	12.137	3.048	-2.996	26.801
Log(Export time)	7890	1.222	1.078	0	7.599
Medium	36907	0.255	0.436	0	1
Micro	36907	0.213	0.409	0	1
Small	36907	0.430	0.495	0	1

Table 3: Regression results

	(1) All	(2) All	(3) Garments	(4) Food	(5) Electronics
Log(Export Time)	-0.148***	-0.137***	-0.338***	-0.095	-0.479*
	(0.000)	(0.004)	(0.002)	(0.292)	(0.072)
Log(Export Time) * Micro	0.113	0.118	0.265	-0.299	0.186
	(0.294)	(0.384)	(0.312)	(0.295)	(0.843)
Log(Export Time) * Small	0.080	0.083	0.284*	-0.067	0.647
	(0.131)	(0.220)	(0.055)	(0.534)	(0.112)
Log(Export Time) * Medium	0.098**	0.083	0.086	0.111	0.511
	(0.025)	(0.106)	(0.476)	(0.219)	(0.159)
Micro	-0.462**	-0.223	-1.222**	0.801*	-0.559
	(0.012)	(0.333)	(0.021)	(0.066)	(0.473)
Small	-0.455***	-0.339***	-1.293***	0.160	-1.348**
	(0.000)	(0.005)	(0.000)	(0.391)	(0.014)
Medium	-0.266***	-0.181*	-0.660**	-0.111	-0.538
	(0.001)	(0.059)	(0.027)	(0.475)	(0.183)
Log(Capital Intensity)		-0.007			
		(0.669)			
Log(Capacity Utilization)		-0.049			
		(0.464)			
Foreign		0.493***			
		(0.000)			
ISO		0.079			
		(0.192)			
Observations	7858	5538	1128	1330	203
R2	0.029	0.029	0.190	0.001	0.234
Fixed Effects	Country-Sector-Year	Country-Sector-Year	Country-Year	Country-Year	Country-Year

*Note: The dependent variable in all cases is % Direct Exports. Regression is by fractional logit. R2 is calculated as the square of the correlation between actual and fitted values. P-values based on standard errors adjusted for clustering in the same dimension as the fixed effects appear in parentheses. Statistical significance is indicated by: * (10%), ** (5%), and *** (1%).*

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