

Understanding the Operations of Freight Forwarders

Evidence from Serbia

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June 2015

Abstract

Freight forwarders play a key role in moving goods across international borders. They arrange transport, oversee customs clearance on behalf of their clients, and more generally troubleshoot issues that arise while goods are in transit. This paper reports the results from a survey of 153 freight forwarding firms in Serbia. Respondents report on firm characteristics, operational choices, and conditions at the border posts and terminals where imported goods are cleared for release. One key purpose of the study is to investigate operational trade-offs between time and cost

that arise when import shipments are in transit. In three of four hypotheticals, respondents suggest that money savings dominate time savings. Responses regarding real operational decisions such as route choices reinforce this finding. Respondents also reported penalty rates for late delivery of import shipments as well as the value of a typical import shipment. From these responses, it is estimated that the contracted value of one additional (unexpected) day of delivery time in Serbia appears to be approximately 1 percent of the value of the underlying shipment.

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Understanding the Operations of Freight Forwarders: Evidence from Serbia*

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Keywords: Trade facilitation, Logistics, Freight forwarding, Trade costs, Serbia.

JEL Classification codes: F13, F14, F15.

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I. Introduction

An efficient logistics sector is an integral part of a sustainable growth strategy for any country. Reducing costs and improving the quality of logistics services allows for more efficient and timely movement of goods which integrates domestic markets and improves access to foreign markets. Better logistics performance is shown to be strongly associated with trade growth, export diversification, and economic growth (Arvis et al., 2010; Behar et al., 2013). The logistics of any supply chain - be it domestic, regional, or global - encompasses freight transportation, warehousing, border clearance, payment systems, and other functions outsourced by producers and traders to specialized providers.

Freight forwarders are some of the key specialized providers in the logistics network. A freight forwarder is an individual or firm that organizes shipments for other individuals or firms, in order to get the goods from the producer to a market (whether to a direct customer or to a distribution point). The freight forwarder need not move the goods itself, but arranges shipping by contracting with a carrier to move the goods (by ship, airplane, truck, railroad, or a combination of these) and arranges storage. Freight forwarders that handle international shipments also assist with preparation and processing of customs and other documentation needed to cross international borders and deal with the relevant government agencies. Freight forwarders' familiarity with the particularities of logistics and administrative hindrances in a given setting means that their views offer important contextual information for understanding international trade frictions.

Both the highly-influential World Bank's Doing Business indicators on the costs of trading across borders as well as the World Bank's Logistics Performance Indicators are to a large extent based on data collected from a small number of freight forwarders in each country. Yet, while assessments of the general trading environment and the ease of trading across borders often rely on such indicators, there is little evidence about freight forwarders' operations within a country based on comprehensive data. This study fills in this knowledge gap by providing evidence on operational behavior of freight forwarders and how it is affected by delays in border procedures based on a survey of 153 freight forwarders in Serbia conducted in 2014. This survey was conducted as a complement to a project estimating the value of time and uncertainty in the context of trade facilitation reforms in the Western Balkans in conjunction with the South East Europe Trade Logistics Project. An important purpose of the survey is to understand trade-offs

between time and costs in trade. We also use the survey as an opportunity to learn more about logistical challenges in the region by the agents that know them best.

The remainder of the paper is broken into four components. In Section II, we describe the freight forwarding firms in the sample based on a range of self-reported statistics. As a whole, the freight forwarding sector in Serbia is focused on the movement of goods from the European Union (EU) market. Those freight forwarders that we identify as medium or large handle approximately ten times as many import declarations per firm as the small freight forwarders. By contrast, the average value associated with an import declaration is largely independent of the size of the freight forwarder, the goods in a typical import declaration are valued at approximately 15,000 euros. While there are not too many operational differences that depend on freight forwarder size, medium and large freight forwarders are more likely to offer transport services and more likely to arrange shipments from outside the EU.

Section III describes some of the operational choices that freight forwarders make in the course of organizing import shipments, including modes of shipment, route choices, and exporting countries that they serve. Approximately half of the freight forwarders consolidate shipments ‘always’ or ‘frequently.’ Consolidation is more common among the medium and large than among the small freight forwarders. The use of multimodal transport is not common, which may reflect the fact that most goods are imported from European locations and travel exclusively by truck. Freight forwarders were more likely to organize shipments from East Asia than from North America, and medium and large freight forwarders were more likely to organize non-European shipments than small freight forwarders. The vast majority of freight forwarders use Northern Adriatic ports to handle overseas shipments. Transport costs are much more significant determinants of route choice than border costs and delays.

Section IV focuses on border clearance times and costs, reporting freight forwarders’ perceptions about the sources of delays that occur as goods are moved across Serbia’s international borders. The vast majority of small freight forwarders report clearing their goods within a single day. Approximately one third of medium and large freight forwarders report clearance times involving an overnight stay, but none of these indicate that two overnight stays are necessary. Freight forwarders indicate that the most common reasons for delays included inadequate documentation, congestion at the border post, and lengthy inspections associated with trade in particular products. Intensive physical inspections were also linked to delays. Only a

small fraction of freight forwarders report that delays are caused by poor performance of customs or other agencies operating at the border.

A key purpose of the survey is to understand the contractual arrangements that govern freight movements. One question of particular interest is the incidence of a delay on a given shipment. Respondents were asked to report the penalty they pay when goods are required to stay at the border post or terminal overnight unexpectedly. For those freight forwarders that manage the transportation service or directly subcontract it, the median response was 150 euros and the average was 210 euros. Given that the value of goods associated with a single import declaration is approximately 15,000 euros, this suggests that the typical direct costs to the freight forwarder from an overnight delay are roughly 1% of shipment value. While freight forwarders may have some options to make up time following a delay, in the majority of cases freight forwarders indicate that they absorb the logistics costs of delay.

Finally, Section V investigates the relative importance of time and monetary costs in operational decision-making by freight forwarders. Respondents were asked about operational decisions in particular situations that impose a direct trade-off between cost and time savings. Freight forwarders were given four choices that indicated a specific trade-off between monetary costs and potential delays. In three of the four cases, cost concerns dominated time savings, while in another case time savings appeared to be more important. Freight forwarders indicated that their clients typically claimed preferential trade agreement tariffs, even if doing so increased the risk of delay. They also risked delay by consolidating shipments, and by delaying shipments in order to get a full truck load. The only case in which time concerns dominated monetary costs was the freight forwarders' choice of border posts as they indicated that they tend to choose faster border posts even when doing so means higher monetary costs. The reported preference for monetary over time savings is consistent with route choice decisions summarized in section III.

II. Data and Characterization of Freight Forwarders

The analysis in this study is based on survey data for a representative sample of international freight forwarders in Serbia, collected by the market research company Ipsos' Serbia branch between August 2014 and November 2014. The questionnaire included 54 questions focusing on

the handling of import transactions, and the data was collected for 153 freight forwarding firms.¹ One of the challenges faced in this data collection exercise was the identification of the universe of freight forwarding firms in Serbia from which a representative sample of firms could be drawn. Table 1 shows the composition of our final survey sample and the initial sub-universes and response rates whose details are provided in what follows. We initially obtained a list of 36 firms that are members of the Serbian Freight Forwarder Association and firms identified by logistics experts in the field as relevant in providing freight forwarder services. Given their relevance, we screened and attempted to survey all firms in this list, and in our final survey sample 11% of firms are these ‘relevant’ freight forwarders. Additionally, we obtained from the National Bank of Serbia a list of 1,311 registered firms in transport and trade related activities (i.e., rail and road transport, cargo handling, etc.) with information on size measured by their number of employees.² We conducted a screening of the firms in both lists to identify those that qualify as international freight forwarders and found that 31% of the firms complied with the screening criteria. Of those 61% were surveyed.

Based on the recent evidence that international trade is highly concentrated in the hands of a few very large firms, we screened and attempted to survey all medium-sized and large freight forwarders (with 50-250 employees and more than 250 employees).³ With a response rate of 77%, these freight forwarders account for 7% of our final sample. A random sample of small freight forwarders was screened and 61% of those identified as international freight forwarders were successfully interviewed. The distribution of freight forwarding firms according to their size is representative of the universe of freight forwarding firms, as shown by Appendix Figures A.1 and A.2.

¹ The questionnaire can be obtained from the authors upon request.

² The registered firms are those with valid contact information available.

³ Cebeci et al. (2012) and Freund and Pierola (2015) show that in any typical developing country the bulk of exports is conducted by a small share of the top exporting firms. We attempted to sample all medium and large freight forwarder firms because it was likely that the distribution of activity across freight forwarders was also skewed, and the survey confirmed that it is.

Table 1. Representativeness of Survey Sample and Response Rates

	Number of firms in list	Proportion in the universe of freight forwarding firms	Number of firms contacted/ screened	Number of firms that complied with screening criteria	Number of firms interviewed	Number of firms successfully interviewed	Response rate (%)	Proportion in final survey sample
<i>Source of Information</i>								
Serbian Freight Forwarding Association & relevant freight forwarders (small and large firms)	36	3%	36	28	17	17	61%	11%
National Bank of Serbia (medium firms with 50-250 employees and large firms with more than 50 employees)	28	2%	28	13	11	10	77%	7%
National Bank of Serbia (small firms with less than 50 employees)	1283	95%	720 (randomly selected)	206	130	126	61%	82%
Total	1347	100%	64	247	158	153	62%	100%

In this study we refer to medium/large firms as those with more than 50 employees (in 2011 and 2012) and small firms as those with less than 50 employees (in 2011 and 2012). The official Serbian government definition of large firms being those with 250 or more employees is not relevant for this sector since such firms are extremely rare.⁴ Among the 153 firms in our final survey sample, only six do not report the number of employees in the National Serbian Bank data and for those we use survey data on the number of employees to identify their size category. Our final survey sample is constituted of 92% of small firms and 8% of medium/large firms.⁵ Based on the employment data from the Bank of Serbia Table 2 shows that the typical (median) small freight forwarder in the final sample has five employees, while the typical (median) medium/large freight forwarder has 66 employees.

Table 2. Employment Distribution Overall and within Freight Forwarder Size Categories

	Number of freight forwarders	Mean number of employees	Standard deviation of number of employees	Median number of employees
Small	135	9.4	10.4	5
Medium/Large	12	98.6	59.9	66
Total	147	16.7	31.1	6

Source: Employment data from the National Bank of Serbia.

⁴ Only two firms that qualify as international freight forwarders have more than 250 employees. One of them was used during the pilot of the survey questionnaire and is not included in the final sample.

⁵ The information on employment collected by the survey is consistent with that in the Serbian Bank data: 90.5% of firms report in the survey that they have less than 50 employees while 9.5% report that they have more than 50 employees.

In the remainder of the study we present indicators based on survey responses for all freight forwarders and where relevant also disaggregated by freight forwarder size. A survey of importing firms would provide an important additional perspective, although many of these firms would not have the specific knowledge of the sources of border delays or other operational decisions made by freight forwarders. Moreover the universe of importing firms would be much larger and more diverse than the universe of freight forwarder firms, making the logistics of such a survey considerably more complex. Our survey questionnaire incorporated where relevant a distinction between freight forwarder decisions and importing firm (client) decisions. Thus our survey reflects where necessary both the freight forwarder as well as the importing firm perspectives.

The primary purpose of the survey is to provide insights into how delivery time - and uncertainty over delivery time - are reflected in the costs of delivery. We investigate operational decisions and ask about the terms of the contracts governing delivery by the freight forwarder. We use the survey to elicit an estimate of the magnitude of the costs of (unexpected) delays, and express these costs as a proportion of the value of the underlying import shipment. In general our survey questions presuppose that the expected costs of delivery (at the expected time) are borne by the importing firm through the contracted fees they pay to the freight forwarder. If an unexpected delay causes the freight forwarder to violate the contractual terms of delivery, the cost of this delay will generally be borne by the freight forwarder.⁶ Insofar as absorbing the costs of delays raises the price of freight forwarding services, the costs of delay should ultimately be borne by importing firms as well. The importing firm may also bear additional induced costs such as additional warehousing or other hedging costs.⁷ In that sense the results we report may understate the size of the costs time and uncertainty. On the other hand, the contracted penalties for late deliveries may include a margin intended to induce effort by the freight forwarder, and so might overstate the true costs to the importing firm of delay.

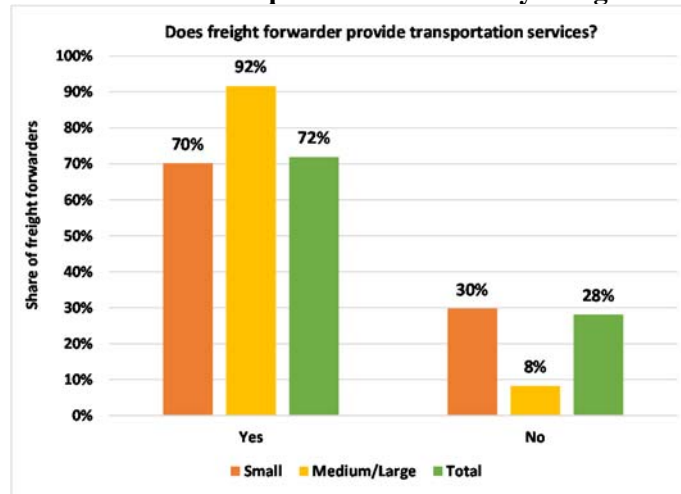
⁶ The costs that a delay of an individual shipment imposes on the importing firm should be covered, in a perfectly competitive equilibrium, by the penalty structure in the contract.

⁷ Marteau *et al.* (2007) argue that importing firms bear the direct costs associated with moving goods (including freight costs, port and handling charges procedural fees, agent sides, and side payments) but also absorb “induced” costs associated with hedging for the lack of predictability and reliability of the supply chain. Only some of these costs are reflected in the fees paid to freight forwarders and transporters.

Most international freight forwarders in Serbia are also transportation providers

A large majority of freight forwarders, though not all, provide transportation services of their own in addition to their provision of freight forwarding services.⁸ Figure 1 shows that 28% of the freight forwarders do not handle transportation. In such cases the importing firm needs to contract separately and directly with a transportation carrier. Small freight forwarders are substantially less likely to provide transportation services than medium/large freight forwarders.

Figure 1. Provision of Transportation Services by Freight Forwarders



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

Larger freight forwarders handle about 10 times as many import declarations as small freight forwarders, but the value of goods in an import declaration is not related to freight forwarder size

The number of import shipments that a freight forwarder handles in a given year varies significantly with the size of the freight forwarder. A medium/large freight forwarder handles 8,405 import shipments per year, a number that is almost 10 times higher than that handled by a small freight forwarder each year, as seen in Panel A of Table 3. However, the median value of an import shipment is similar across all freight forwarders, at about 15,000 euros. Panel B shows that on average the share of the business (revenues/sales) that involves the largest client is similar across freight forwarders, at about one-third. However, the median share is 23% for

⁸ Note that in our analysis we will be focusing only on the freight forwarder contract, not on the contract of sale, thus we do not refer to incoterm codes, i.e., the commercial terms published by the International Chamber of Commerce (ICC) that divide tasks, responsibilities, transaction costs, and risks associated with the transportation and delivery of goods internationally among buyer and seller. The contract of interest to us is the contract terms relevant to the delivery of the goods by the freight forwarder.

medium/large freight forwarders and 30% for small freight forwarders. Therefore, the size of the shipments is similar regardless of the size of the freight forwarder but the frequency of trading is higher for medium/large freight forwarders which also have a more diversified portfolio of clients.

Table 3. Import Shipment Numbers and Values, and Diversification across Clients
Panel A. Import Shipment Numbers and Values

	Number of freight forwarders	Average number of import shipments per year	Median number of shipments per year	Standard deviation of number of shipments per year	Average value of an import shipment (in euros)	Median value of an import shipment (in euros)	Standard deviation of an import shipment (in euros)
Small	138	2,170	800	5022	15,454	15,000	10,284
Medium/Large	12	29,609	8,405	57,054	14,894	15,000	11,750
Total	150	4,365	1,000	17,869	15,416	15,000	10,335

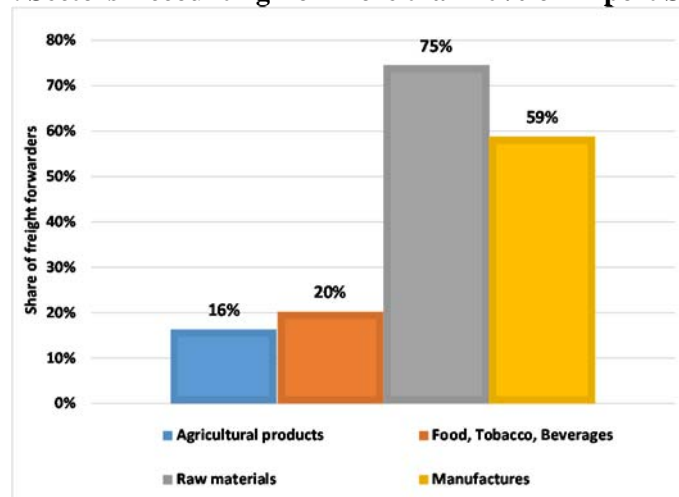
Panel B. Diversification across Clients

	Number of freight forwarders	Share of business that involves the largest client - average	Share of business that involves the largest client - median
Small	134	32%	30%
Medium/Large	12	33%	23%
Total	146	32%	30%

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Freight forwarders listed all the sectors which account more than 20% of their import shipments and the majority reported raw materials and manufactures as being their main import sectors, as seen in Figure 2. Less than a fifth of the freight forwarders reported agricultural products or food, tobacco, beverages as accounting more than 20% of their import shipments.

Figure 2. Sectors Accounting For More than 20% of Import Shipments



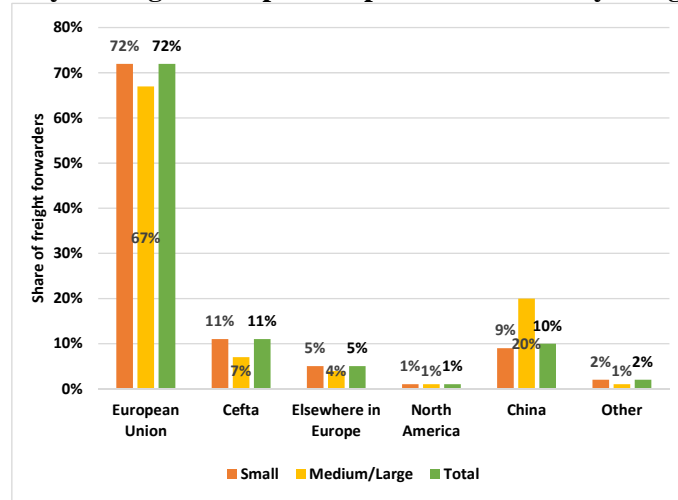
Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.
Note: the statistics shown are based on responses by all 153 freight forwarders.

Most freight forwarders specialize in moving goods from the European Union and those that handle goods from outside Europe tend to be larger

Almost three-quarters of the import shipments that Serbian freight forwarders handle originate in the European Union (EU), as seen in Figure 3.⁹ However there are important differences across freight forwarder size for other countries of origin. Small freight forwarders import a relatively larger share from CEFTA countries and other European countries compared to medium/large freight forwarders whereas medium/large freight forwarders import a substantially larger share from China compared to small freight forwarders. A possible conjecture for this fact is that small freight forwarders have limited capacity to manage more complex supply chains such as those with a distant country like China.

⁹ Each freight forwarder provided the percentages of import shipments originating in six mutually exclusive groups of countries. Hence for small or for medium/large freight forwarders the proportions shown in the different bars in Figure 3 add up to 100%.

Figure 3. Country of Origin of Import Shipments Handled by Freight Forwarders



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.
Note: the statistics shown are based on responses by all 153 freight forwarders.

III. How Freight Forwarders Operate

This section describes the types of activities undertaken by firms in the course of fulfilling their specific freight forwarding duties. Respondents were asked how often they consolidate shipments, whether they use multi-modal transport, as well as details about route choices for inter-continental movements of goods.

Larger freight forwarders consolidate products more frequently than small freight forwarders

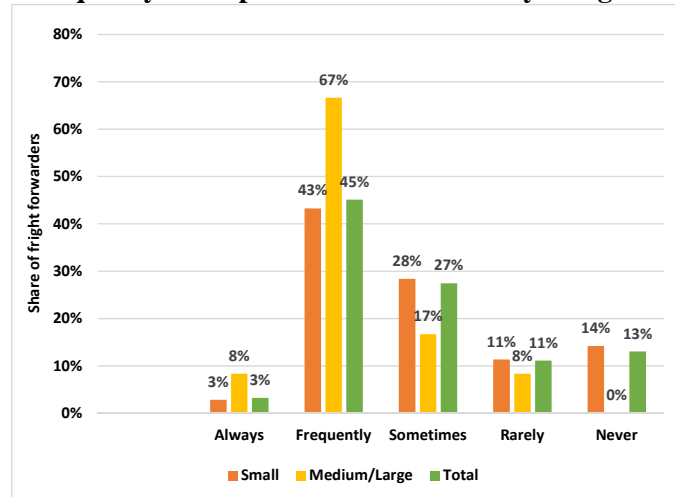
Freight forwarders can organize consolidated shipments that are comprised of different products of the same client, or of similar/different products of different clients.¹⁰ Consolidating shipments has the benefit of lowering shipping costs but has the risk of taking potentially longer time to be delivered due to a higher risk of inspection by customs (and possibly higher cost) and/or due to longer time to organize a full shipment/container.¹¹ Figure 4 shows that the frequency of shipment consolidation varies with firm size: 75% of medium/large freight forwarders either always or frequently consolidate shipments of different products or clients while only 46% of small freight forwarders always or frequently consolidate shipments and actually a quarter rarely or never consolidate shipments. Moreover, when they do consolidate

¹⁰ The decision to consolidate may be taken either by the freight forwarder or by the importing firm.

¹¹ Customs operations specialists have indicated to us that when there is a mix of products and/or importing firms, the likelihood of a physical inspection by the customs agency increases. Also, if customs clearance for one product/client is taking longer than the others, the entire consolidated shipment is delayed.

shipments, medium/large freight forwarders tend to consolidate similar products of different clients, while small freight forwarders tend to consolidate different products and different clients.

Figure 4. Frequency of Shipment Consolidation by Freight Forwarders



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

Interestingly the benefits from shipment consolidation are similar across freight forwarder size: close to 70% of freight forwarders of any size in Serbia consider the additional earnings from organizing a consolidated shipment (relative to a non-consolidated shipment) to be in the range of 1% to 20% in Table 4. Given the comparable magnitude of the benefits, the lower frequency of consolidation by small freight forwarders might be due to the following reasons. First, small freight forwarders may be more vulnerable to the risks associated with consolidated shipments, namely the delays and uncertainty regarding the time a shipment will spend before clearing customs. Second, consolidation may imply additional logistics or organizational processes that are more difficult to undertake by small freight forwarders. Third, small freight forwarders may not have enough business to consolidate frequently.

Table 4. Additional Earnings on Consolidated Shipments for Freight Forwarders

	Number of freight forwarders	Share of firms indicating range for additional earnings from consolidating relative to not consolidating a shipment				
		1 to 5 %	5 to 10%	10 to 20%	20 to 50%	More than 50%
Small	107	22%	21%	22%	22%	14%
Medium/Large	11	27%	18%	27%	9%	18%
Total	118	22%	20%	22%	21%	14%

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Only a small share of freight forwarders use multimodal transport

Multimodal transport is the combination of air/rail/road/sea type of transport to carry goods from the country of origin to the final destination. The majority of freight forwarders use multimodal transport for less than 25% of their shipments and close to a quarter do not use multimodal transport for any of their shipments. This is driven to a large extent by the geographic position of Serbia and the fact that on average 70% of the handled import shipments come from the EU, therefore freight forwarders mainly use road transport to transit within Europe.

Table 5. Use of Multimodal Transport for Import Shipments by Freight Forwarders

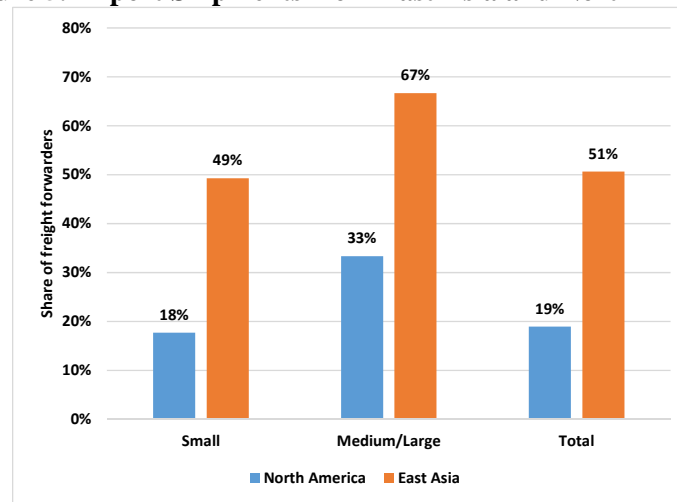
	Number of freight forwarders	Share of firms indicating share of shipments using multimodal transport				
		75% or more	50-75%	25-49%	Less than 25%	Zero
Small	141	9%	9%	6%	53%	23%
Medium/Large	12	8%	0%	25%	33%	33%
Total	153	9%	8%	8%	52%	24%

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Fewer freight forwarders handle imports coming from North America than from East Asia

Focusing on non-European shipments, only 19% of freight forwarders handle imports coming from North America while half of the freight forwarders do handle imports from East Asia, as seen in Figure 5. Medium/large freight forwarders are more likely to handle non-European shipments. Of the freight forwarders that handle non-European import shipments, more than 50 percent organize those shipments from the source country itself (not limiting themselves just to moving the goods within Europe).

Figure 5. Import Shipments from East Asia and North America



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders for North America and 152 freight forwarders (140 small and 12 medium/large) for East Asia.

Most overseas shipments are transited through Northern Adriatic ports

Freight forwarders that organize non-European shipments utilize several routes and transport options. Table 6 shows that for both East Asian and North American imports, the Northern Adriatic ports (Rijeka, Koper, Trieste) are the most common choice for the majority of freight forwarders. But there are differences across size on the main second route chosen for East Asian imports: the port of Bar for small freight forwarders and air transfer for medium/large freight forwarders (while no small freight forwarder uses air transfer). For both East Asian- and North American- origin imports, a single medium/large freight forwarder indicated that it most commonly moves intercontinental shipments by air.

The choice of Northern Adriatic ports over Thessaloniki for East Asian and Rotterdam for North American shipments may be interpreted as a choice of cost savings over speed by freight forwarders. According to international data on shipping distances and time, Serbian freight forwarders could move goods much more quickly through these more distant ports.¹² Shipments traveling from East Asia to Belgrade via the Suez Canal would arrive more than one day sooner if routed through Thessaloniki. Moving North American goods through Rotterdam to Belgrade, rather than through Northern Adriatic ports, would save three days of transit time. While there are multiple factors to consider when assessing land versus sea transport, a key

¹² Data on international shipping distances and time was obtained from the website <http://www.searates.com/reference/portdistance/>.

factor is likely to be cost - it is cheaper to move goods by sea than overland. We take freight forwarders' choices of longer sea routes over faster routes involving more overland travel to be indicative of a preference for lower **transport cost** over faster shipping times.

Table 6. Seaport or Air Transport Use for Imports from East Asia and North America

	Number of freight forwarders	Share of firms indicating share of shipments using each seaport or using air transfer						
		Thessaloniki	Rotterdam	Bar	Northern Adriatic ports	Air transfer	Amsterdam	Not applicable
<u>For East Asian Imports</u>								
Small	69	10%	1%	17%	67%	0%	1%	3%
Medium/Large	8	0%	0%	0%	75%	13%	0%	13%
Total	77	9%	1%	16%	68%	1%	1%	4%
<u>For North American Imports</u>								
Small	23	4%	4%	9%	65%	9%	0%	9%
Medium/Large	4	0%	0%	0%	75%	25%	0%	0%
Total	27	4%	4%	7%	67%	11%	7%	0%

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Freight costs are a substantially more important factor affecting route choice than border-related costs or delays

Many factors can determine route choice for a given shipment by a freight forwarder, some related to freight costs, others related to time or uncertainty in clearance procedures along the route. Freight costs are the main factor affecting route choice for the large majority of freight forwarders but the relative importance of ocean versus overland differs by size, as seen in Table 7. Ocean freight costs are important for more of the small freight forwarders while overland freight costs are important for more of the medium/large freight forwarders. Border costs/delays in countries other than Serbia are the main determinant of route choice for just a minority of freight forwarders, more so for larger ones. Border costs or delays in Serbia play no meaningful role as determinants of route choice.

Table 7. Main Factor Determining Route Choice by Freight Forwarder Size

	Number of freight forwarders	Share of firms indicating this as major factor affecting route choice			
		Ocean freight costs	Overland freight costs	Border costs/delays outside Serbia	Border costs/delays in Serbia
Small	130	48%	38%	9%	5%
Medium/Large	11	36%	45%	18%	0%
Total	141	47%	38%	10%	5%

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

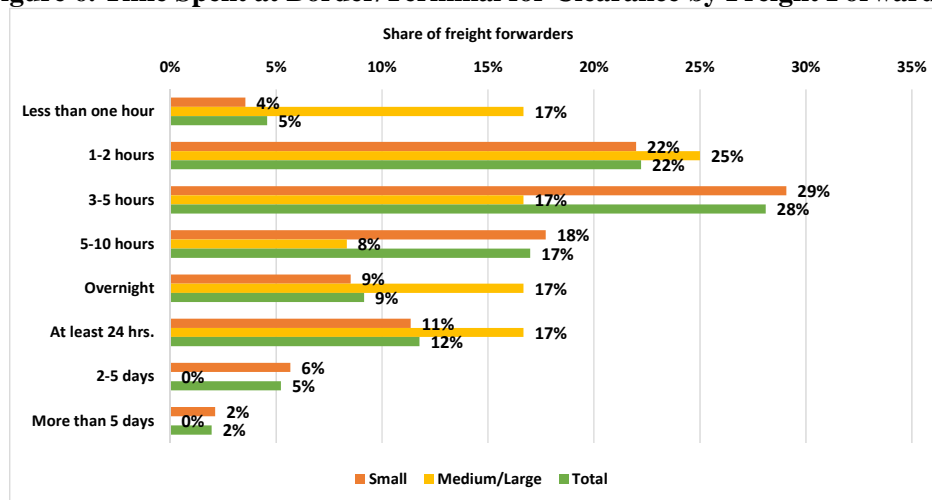
IV. Border Clearance Time, Delays, and Costs

In this section we focus on the frequency, source, and magnitude of delays at the border, as well as freight forwarders' response to delays and the consequences of delays for freight forwarders' business.

Reported border clearance times exhibit considerable heterogeneity

Since a key objective of our survey is to understand the effects of delays in the process of importing we inquired with freight forwarders about border-related clearance procedures for a typical import shipment of the most traded product, referring to all agencies involved in border/terminal clearance (not differentiating between customs and technical agencies). For small freight forwarders, a typical import shipment is expected to be cleared in 1 to 5 hours, as seen in Figure 6, and only 4% of them expect to clear their import shipments in less than an hour. In contrast, 17% of medium/large freight forwarders expect to clear their import shipments in less than an hour and 25% in 1 to 2 hours. But at the same time, overnight stays at the border or terminal and at least 24 hours for clearance of import shipments are substantially more likely for medium/large freight forwarders (34%) than for small freight forwarders (20%). Yet no medium/large freight forwarder expects to spend more than 2 days to clear import shipments while 8% of small freight forwarders expect so.

Figure 6. Time Spent at Border/Terminal for Clearance by Freight Forwarders



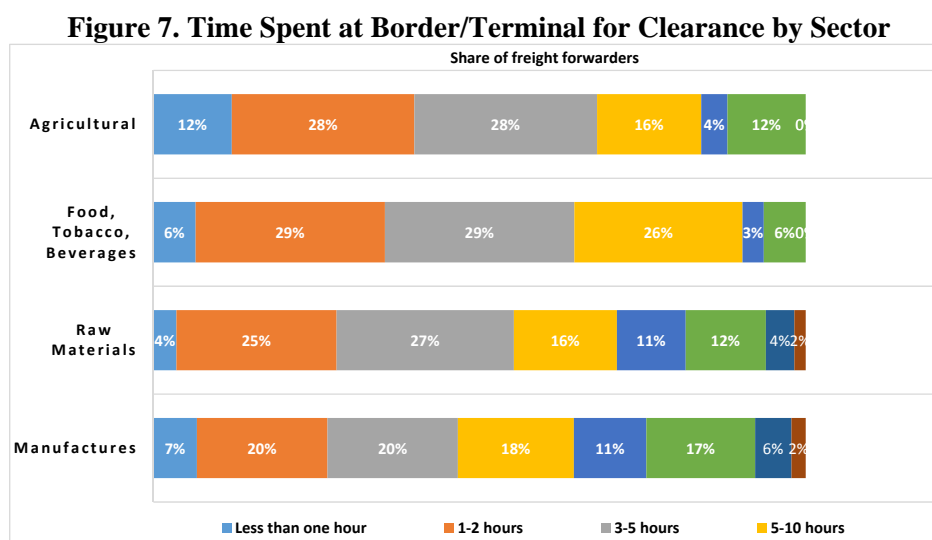
Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

While it is not entirely clear-cut which type of freight forwarder experiences longer clearance time, the findings suggest that medium/large freight forwarders are able to clear their typical import shipment faster, even though they also face a higher probability of having their import shipments spend a night at the border post or terminal for clearance.

Although imports of agricultural products and foodstuffs are usually more subject to inspections, most freight forwarders clear these in less than a day

For freight forwarders importing agricultural products or food, beverages, and tobacco 80% or more have their typical import shipments cleared within a day in Figure 7. In fact, 12% of freight forwarders importing agricultural products clear their shipments in less than 1 hour. In contrast, about a third of freight forwarders that import raw materials or manufactures spend a night at the border post or terminal or at least 24 hours to clear their typical shipments. While agricultural goods often require more inspections than other goods, the faster reported clearance times likely reflect the existence of expedited procedures for goods that are time-sensitive, because they are more sensitive to spoilage, for example.¹³ The survey provides some additional evidence that this is the case: the majority of freight forwarders report that cold storage shipments are always or frequently given priority for clearance at the border.



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

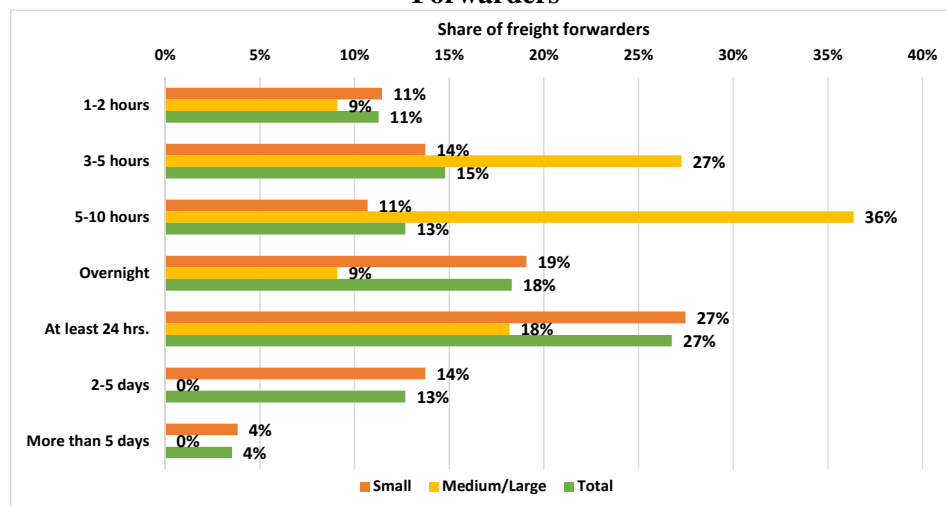
¹³ According to the Revised Kyoto Conventions live animals and perishable goods are supposed to be given preference in scheduling examinations.

For most freight forwarders a critical delay in clearance is 1 additional unexpected day

A delay is defined in our survey as the additional unexpected time that an import shipment has to spend at the border/terminal to be cleared such that the freight forwarder is at risk for breaching its contractual obligations. A quarter of the freight forwarders indicate that a critical delay consists of 1 additional unexpected day, but the other three-quarters are evenly distributed across very different time categories. When disaggregating the data by freight forwarder size some differences are identified in Figure 8. The majority of medium/large freight forwarders (63%) consider a delay to be an additional 3 to 10 unexpected hours at the border post or terminal while the majority of small freight forwarders (60%) consider a delay to be either staying overnight at the border post or terminal or clearance to take up to five additional unexpected days.

Additionally, we find that freight forwarders consider delays to be of relatively similar magnitude regardless of their main import sectors: for any sector between a third and (almost) a half consider a typical delay as having to stay overnight or at least 24 hours at the border post or terminal.

Figure 8. Additional Unexpected Time Spent at Border/Terminal for Clearance by Freight Forwarders



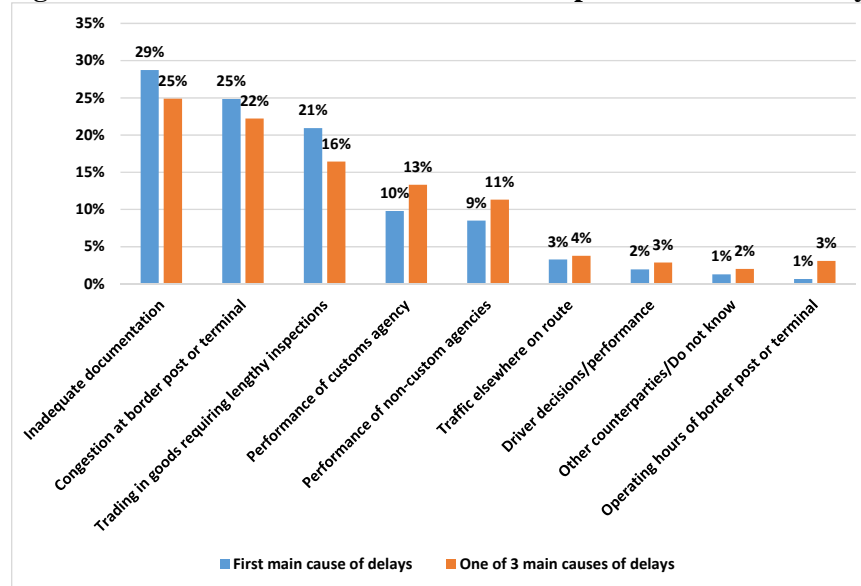
Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

The main causes for unexpected clearance delays are inadequate documentation, congestion at the border, and trading in goods that require lengthy inspections

Regarding the main causes of unexpected delays in the clearance process, a large majority of freight forwarders indicate that inadequate documentation (29%), or congestion at the border (25%), or trading in goods that require lengthy inspections (21%) are the first main cause, as seen in Figure 9. Only a tenth of the freight forwarders indicate the performance of the customs agency as the first main cause of delays and close to another tenth indicate the performance of other agencies operating at the border being the first main cause of delays.¹⁴ These proportions increase slightly when we combine the responses of freight forwarders to what were the first main cause, the second main cause, and the third main cause of clearance delays, as seen in the right set of bars in Figure 9. These patterns are quite similar across freight forwarders of any size.

Figure 9. One of Three Main Causes of Unexpected Clearance Delays



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

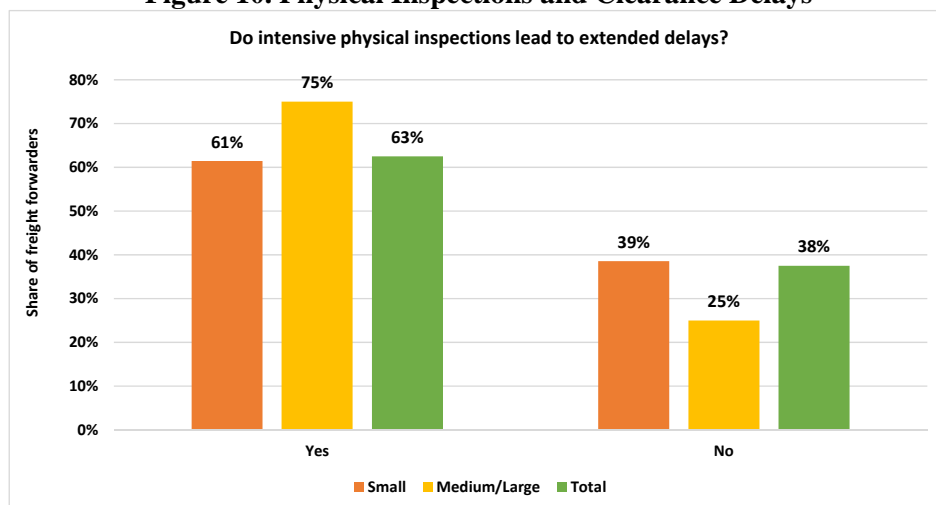
Note: the statistics shown are based on responses by all 153 freight forwarders.

Further evidence on inspections as a cause of clearance delays is shown in Figure 10 that shows 63% of freight forwarders indicating that intensive physical inspections frequently lead to

¹⁴ Many freight forwarders indicate that they do not trade in goods that require them to interact with the non-customs agency.

delays in clearance at the border post or terminals, with that percentage being actually higher for medium/large freight forwarders.¹⁵

Figure 10. Physical Inspections and Clearance Delays



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by 152 freight forwarders (140 small and 12 medium/large).

Regarding the poor performance of customs and other border agencies and how that may lead to unexpected delays in the clearance process, Table 8 shows that freight forwarders report poor training (of officials), understaffing, and lack of automation as the top three reasons for that poor performance.

Table 8. Ranking of Reasons for Border Agencies to Cause Unexpected Clearance Delays

Freight forwarders' ranking
1 - Poor Training (2.80)
2 - Understaffing (2.86)
3 - Lack of automation (2.90)
4 - Insufficient physical infrastructure at border/terminal (3.00)
5 - Corruption (3.93)

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: Mean rank reported in parentheses. Rank of 1 represents the biggest problem. The statistics shown are based on responses by 128 freight forwarders (117 small and 11 medium/large).

¹⁵ The risk of physical inspection is itself linked to shipment consolidation, more strongly so for small freight forwarders than for medium/large freight forwarders, as seen in Appendix B.

However it is also interesting to note that 42% of the freight forwarders in our sample report that the efficiency and quality of border agencies improved over the 2010-2013 period, while 40% indicate it did not change, as seen in Table 9.

Table 9. Perceptions of Performance of Border Agencies

	Number of freight forwarders	Share of firms indicating this regarding the quality and efficiency of border agencies over the period 2010-2013			
		Improved	Stayed the same	Worsened	Does not know
Small	141	43%	40%	16%	1%
Medium/Large	12	42%	50%	8%	0%
Total	153	42%	41%	16%	1%

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

The majority of freight forwarders absorb the losses when a shipment is unexpectedly delayed

The response to delays in clearance at the border post or terminal for more than half of the freight forwarders (55%) is to absorb the related liability and losses and the shipment continues as normal to the initial destination, whereas for 21% it is to redirect shipments to another route/border post or terminal, and for 15% it is through a driver response in terms of driving faster, as seen in Table 10. Only 3% of freight forwarders report experiencing no costs from delays or no delays. We also find that 84% of freight forwarders communicate with drivers about shipments when experiencing clearance delays. The largest difference in the response to delays across freight forwarder size in Table 10 concerns the redirection of shipments: chosen by 23% of the small freight forwarders but only by 8% of the medium/large freight forwarders. Another meaningful difference is seen in the proportion of freight forwarders that contact customs officials to expedite the process, which is 8% for medium/large freight forwarders but only 1% for small freight forwarders. This finding suggests that larger freight forwarders have more leverage with government officials and are likely to get more attention and assistance when they face unexpected delays.

Table 10. Response to Clearance Delays by Freight Forwarders

	Number of freight forwarders	Share of firms indicating each option as a response to clearance delays						
		Absorb losses/shipment continues as normal	Redirect shipments	Driver responds	No costs involved/ No delays	It depends	Contact customs officials to expedite process	Not applicable
Small	134	55%	22%	15%	2%	1%	1%	3%
Medium/Large	12	50%	8%	17%	8%	0%	8%	8%
Total	146	55%	21%	15%	3%	1%	2%	3%

Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Freight forwarders pay penalties when shipments are delayed but rarely lose business as a result

Considering the standard delivery contract for a freight forwarder, it sets up a delivery date for 74% of freight forwarders but sets up a specific hour of delivery for only 8% of freight forwarders.¹⁶ Among freight forwarders with either a delivery date or a specific hour of delivery in their contracts, 70% report that penalties apply for a late delivery.¹⁷ In contrast, all freight forwarders report that no penalties apply to early delivery. When asked about the type of penalties for delays 80% of freight forwarders report that penalties are established as a fixed rate (rather than as a proportion of shipment value).¹⁸ The fixed penalty rate reported for a shipment held unexpectedly at the border post or terminal overnight (thus delivered 1 day later than specified in the contract) is 210 euros on average and 150 euros at the median.¹⁹ The reported rates are very similar regardless of freight forwarder sizes.

A third of the full sample of freight forwarders report that penalties are incremental with each day of delay but the magnitude of such increments is not generic, rather it often depends on the contract negotiated between the freight forwarder and its client (the importing firm). Therefore it is not possible to construct a generic schedule of the penalty rates associated with different delays.

One conceptually useful measure that has been introduced elsewhere in the literature is the tariff equivalent value of a day. Hummels and Schaur (2013) use transport mode choices (air versus sea) in an econometric study of the implicit value that importers attach to time savings.

¹⁶ These percentages are calculated out of responses by 152 freight forwarders (140 small and 12 medium/large).

¹⁷ These percentages are calculated out of responses by 113 freight forwarders (103 small and 10 medium/large).

¹⁸ These percentages are calculated out of responses by 91 freight forwarders (84 small and 7 medium/large).

¹⁹ The statistics on the penalty fixed rates are reported based on responses by 79 freight forwarders (72 small and 7 medium/large). The penalty at the 75th percentile of the distribution is 500 euros and the maximum penalty reported is 2000 euros. Coincidentally, 150 euros also corresponds to the current level of charges associated with using a truck for one more day than is contracted.

They estimate that a day saved in transport is worth between 0.6 to 2.1 percent of the value of the goods using U.S. import data. Given Serbia's landlocked status, and the fact that most imports move by truck from Europe, it is difficult to estimate this value for Serbia in the same manner. We can however use the reported penalties for delay to provide a secondary estimate.²⁰ These penalties were negotiated between importing firms and freight forwarders and should therefore reflect a "market price" of an unexpected delay.²¹

Given that the median value of an import shipment for our sample of freight forwarders is 15,000 euros (or 17,500 euros for the sub-sample reporting penalties for delays), a 150 euro penalty for a one day delay corresponds to about 1 percent (0.9 percent) of the value of the import shipment. This represents a penalty rate, so while it is the cost to the freight forwarder of delays it may overstate the true cost of delay for the importing firms.²² Importing firms may also have various hedging and warehousing strategies that they employ to limit the costs of delays. Marteau *et al.* (2007) label these "induced" costs of unreliable supply chains that are borne by the importing firm. To the extent that these latter costs do not appear in the contracted penalty rate then the estimate may understate the true costs of unreliable supply chains.²³

Despite this clear monetary cost and despite causing disruption to freight forwarders' operations and delivery of shipments, the impact of clearance delays on freight forwarders' business seems to be limited. Only 26% of freight forwarders lost a client due to delays at the border post or terminals.²⁴ Of those freight forwarders that lost a client to clearance delays, 90% indicate that this situation is actually rare or happens only once a year (rather than weekly or monthly) and 70% of them experienced the most recent client loss due to delays of 1 to 2 days.²⁵

V. Trade-Offs between Time Savings and Cost Savings

Freight forwarders were asked about four hypothetical choices they or their clients might have to make in the course of their operations in order to assess if there are relevant trade-offs

²⁰ An econometric study that attempts to estimate this value using Serbian import data is currently under way.

²¹ Note that this figure is the market value of an "unexpected" additional day in transit, while the Hummels and Schaur (2013) estimate is better understood as the estimated value of a planned additional day.

²² Penalty rates would likely be set higher than the actual cost of delay in order to encourage freight forwarders to minimize the frequency and length of delays

²³ Our calculation estimates the market penalty of a realized unexpected additional delay for a single shipment. "Induced" costs to importing firms are incurred in the expectation that such realizations are sufficiently common that they should be hedged.

²⁴ These percentages are calculated out of responses by 152 freight forwarders (140 small and 12 medium/large).

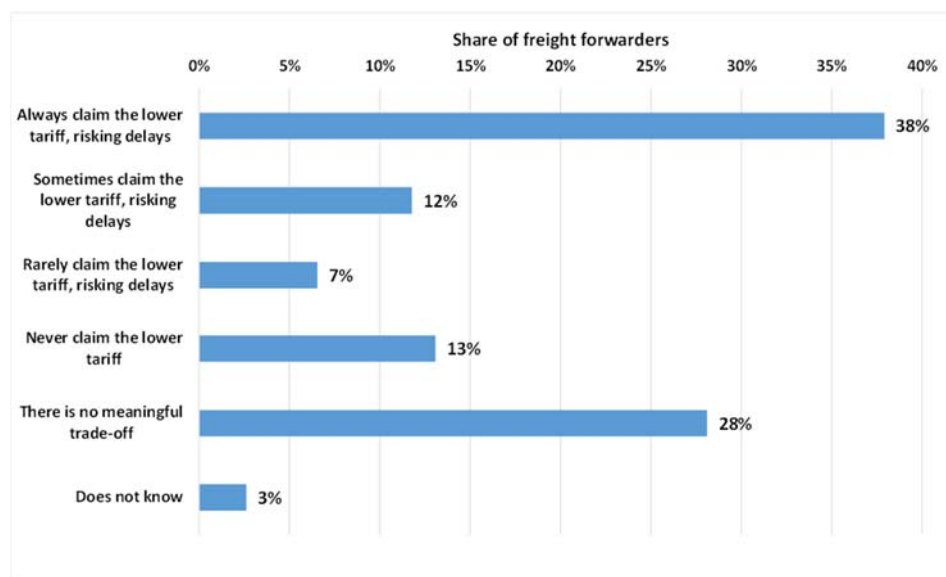
²⁵ These percentages are calculated out of responses by 40 freight forwarders (36 small and 4 medium/large).

between delays in the time to deliver their shipments and monetary costs, or put differently between time savings and cost savings.

In three of the four hypothetical choices, monetary savings are more important than time savings

First, a hypothetical choice related to the use of preferential trade agreements' tariffs is considered in Figure 11. When a freight forwarder (or more likely, their client) chooses to claim a lower preferential trade agreement tariff on an import shipment it is necessary to present documentation on the country of origin of the shipment. Moreover if there are rules of origin associated with the preferential tariff, a certificate of origin also needs to be provided for the customs agency to verify compliance with the rules of origin. These verifications are likely to involve more frequent/longer inspections and longer time under review at the border. The first choice for Serbian freight forwarders, with close to 40% indicating it, is that they would always claim the lower tariff risking delays. This is followed by the second choice selected by 28% of freight forwarders that there is actually no meaningful trade-off between costs savings due to claiming a lower preferential tariff and a longer clearance time due to a higher risk of inspection. The next choices are split almost evenly between never claiming the lower preferential tariff (13%) and sometimes claiming the lower preferential tariff risking delays.

Figure 11. Preferential Tariff Claim versus Longer Clearance Time

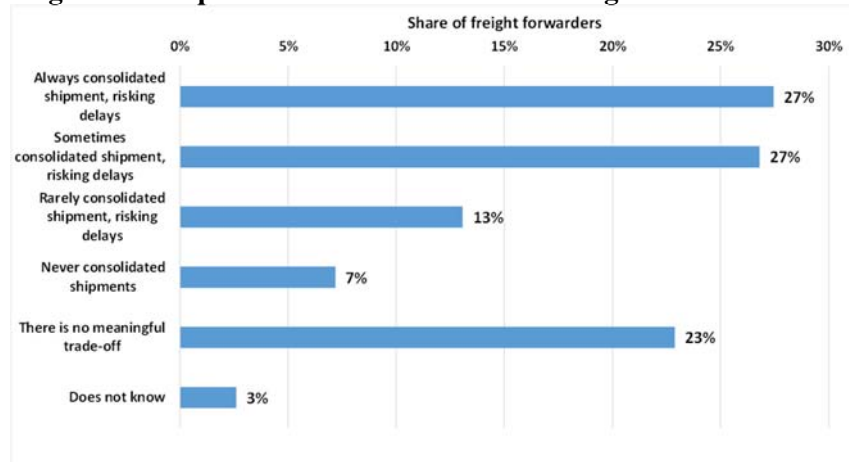


Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

Second, a hypothetical choice related to the consolidation of shipments is considered in Figure 12. Freight forwarders that consolidate shipments lower shipping costs for their clients, but at the risk of more frequent or longer inspections and longer clearance time. More than 50% of freight forwarders report that they (or their clients) would always or sometimes choose to include goods in consolidated shipments, risking a longer clearance time. The third choice picked by 23% of the freight forwarders is that there is no meaningful trade-off between shipment consolidation and longer clearance time.

Figure 12. Shipment Consolidation versus Longer Clearance Time

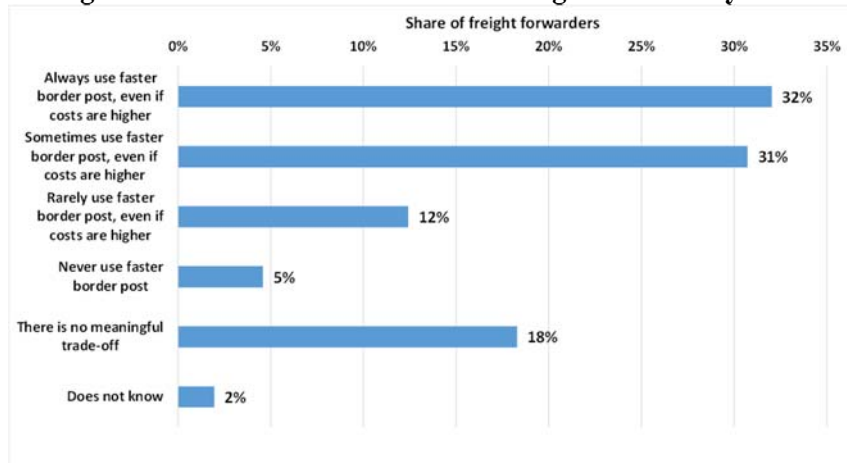


Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.

Note: the statistics shown are based on responses by all 153 freight forwarders.

Third, a hypothetical choice related to the choice of a border post is considered in Figure 13. In the previous two hypothetical choices the majority of freight forwarders indicated choices that would reduce monetary costs but could imply clearance delays. However, when asked whether they would use a border post that operates more quickly even if that implied higher monetary costs (e.g., related to higher transportation costs), more than 60% of freight forwarders indicated that they would, always or sometimes, use the faster border post even if the costs were higher. The next preferred choice for 18% of freight forwarders is that there is no meaningful trade-off between a faster border post.

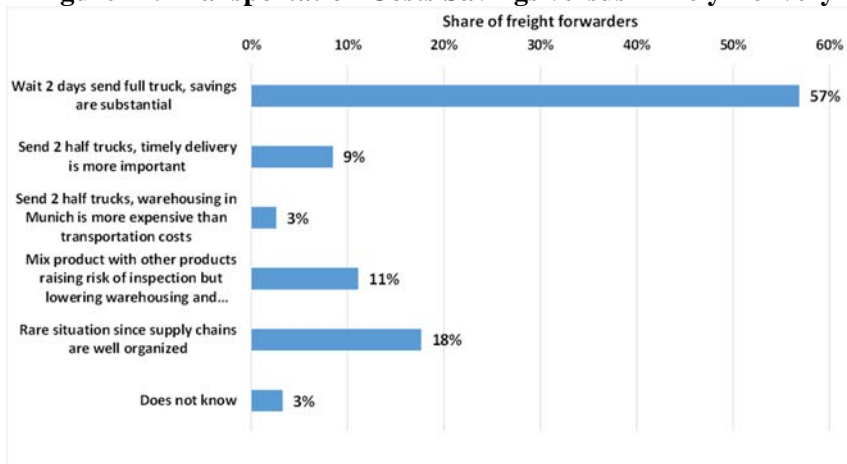
Figure 13. Faster Border Post versus Higher Monetary Costs



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.
 Note: the statistics shown are based on responses by all 153 freight forwarders.

Finally, a hypothetical choice related to shipping choices is considered in Figure 14, namely freight forwarders were asked what they (or their clients) would do and why if they were given the opportunity to ship a half truckload of a certain product from Munich the next day and a second half truckload shipment of the same product two days later. The assumption made was that the product being shipped would not spoil and would not be subject to technical agencies' inspections so few delays at the border would be expected. The majority of freight forwarders (57%) indicated that they would choose to wait two days to send a full truckload given that transportation costs are substantial. The second preferred choice indicated by 18% of the freight forwarders is that this situation rarely happens, as supply chains are well organized.

Figure 14. Transportation Costs Savings versus Timely Delivery



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.
 Note: the statistics shown are based on responses by all 153 freight forwarders.

VI. Concluding Remarks

While freight forwarding firms are not important to most economies in terms of their employment or the value of their output, they play a critical role as facilitators of international goods trade. But the sector's operation and its challenges are often not well understood. This study provides evidence on the operational behavior of international freight forwarders operating in Serbia, with a specific focus on the challenges involved with moving goods across international borders. These insights are derived from a survey of 153 freight forwarders in Serbia conducted in 2014.

The key lesson from this study concerns the relative importance that freight forwarders attach to time savings versus monetary cost savings. Responses to several hypothetical questions as well as to questions about actual operational decisions suggest that often monetary savings have a higher priority than time savings. First, Serbian freight forwarders indicate that transport costs are a substantially more important determinant of route choice than delays at borders or administrative costs. Second, the choice of Northern Adriatic ports over more distant European ports that would allow faster delivery also suggests a preference for monetary savings. Third, in three out of four specific hypothetical situations that impose a direct trade-off between monetary costs and time-savings, Serbian freight forwarders reported that they would give up time savings in order to have monetary savings. Freight forwarders indicated that they (or their clients) typically claimed preferential tariffs, even if doing so increased the risk of delay. They also risked delay by consolidating shipments, and by delaying shipments in order to get a full truck load. The only situation in which time savings concerns dominated monetary costs was the freight forwarders' choice of border posts as they indicated that they tend to choose faster border posts even when doing so means higher monetary costs.

There are a host of operational decisions that lie behind the delivery of an international shipment. It can therefore be difficult to summarize the particular factors that determine these choices. This study provides some context through a comprehensive survey of the firms that make such choices in Serbia, an upper-middle-income country. One key lesson from the study is that lower operating costs often dominate speed in key operations decisions. An interesting policy question that arises from our study is whether, given that freight forwarders generally absorb the logistics costs of delay (which presumably leads them to charge higher average rates)

trade facilitation reforms in Serbia would mainly lead to a reduction in costs for freight forwarders only or whether that would be passed on to the firms hiring them. That is, it will be important to study in the future the pricing behavior and degree of market power of freight forwarders as the costs they face change.

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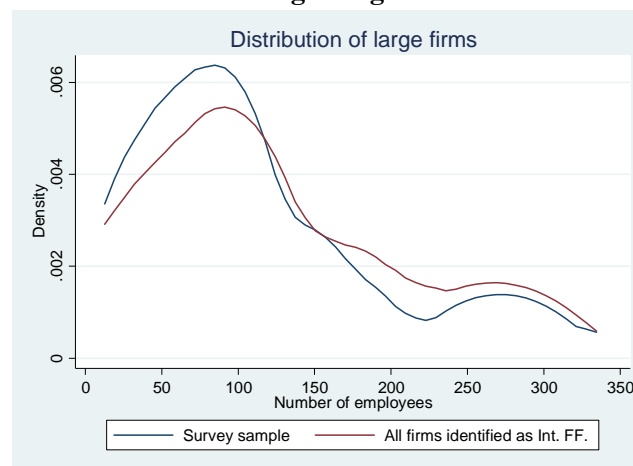
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Appendix

Appendix A. Selection of Sample

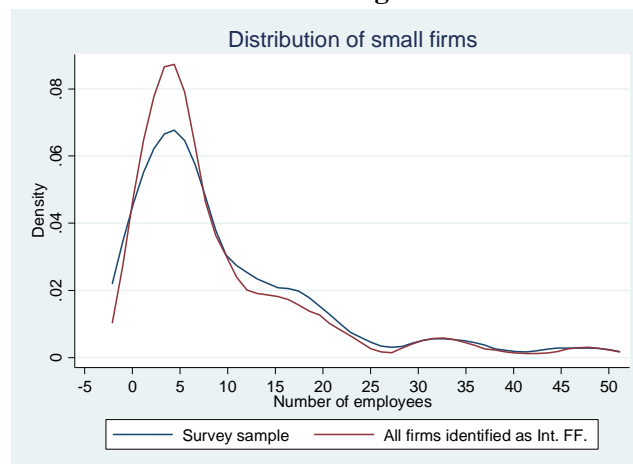
Given the purpose of our survey, we attempted to include in the sample most of the medium and large firms identified as international freight forwarders (Int. FF.) in Serbia. The specific size distribution across different numbers of employees for the large Int. FF. in our sample is representative of the distribution for the universe of medium and large Int. FF. as is shown in Appendix Figure 1. The specific size distribution across different numbers of employees for the small Int. FF. in our final sample is also similar to that for the universe of small Int. FF., as seen in Appendix Figure 2.

Appendix Figure 1. Distribution of size for large freight forwarders in universe and in our sample



Source: Employment data from the National Bank of Serbia.

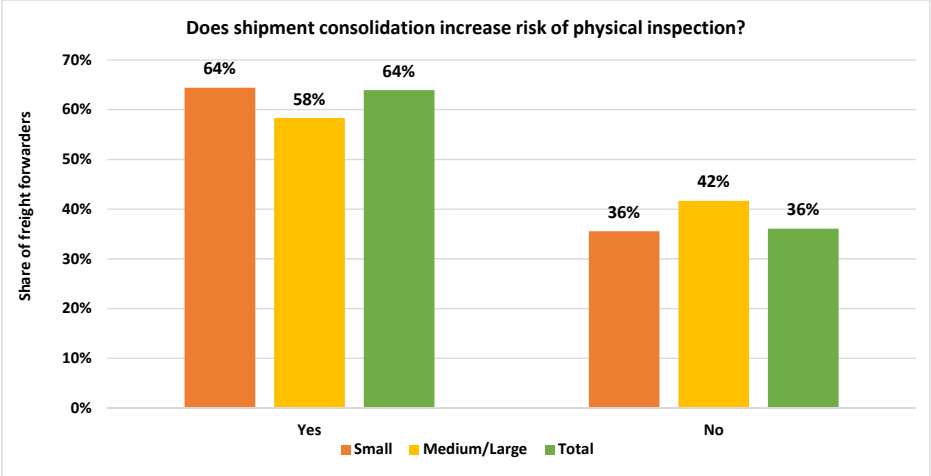
Appendix Figure 2. Distribution of size for small freight forwarders in universe and in our sample



Source: Employment data from the National Bank of Serbia.

Appendix B. Additional Findings

Appendix Figure 3. Shipment Consolidation and Inspections



Source: Authors' calculations based on data from the Survey of Serbian Freight Forwarders.