Strategic Currency Choice in International Trade*

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Abstract

How exporters choose currency for their exports? Using highly disaggregated data on the population of Russian Federation exporting firms between 2005 and 2009 this paper studies the strategic determinants of currency invoicing decisions. Strategic morives embrace the bargaining powers over the currency choice and, in contrast to the micro and macro determinants, are found to be realised differently at the aggregate and firm level. Foremost, this is the first paper that shows that the firm-level dimension should be taken into account when making inferences on currency denomination. On the industry level the higher country's bargaining power lessens the reliance on "vehicle" currency and increases the probability of use of the trading partners' currencies, whereas the increase of the firm level bargaining power increases the probability of application of the "vehicle" currency. This finding suggests a novel link between bilateral trade expansion and the exporter's currency choice being conditioned on the trade structure between the countries. Additionaly, the paper posits that due to the realisation of strategic determinants the vehicle currency is used for the relatively cheaper sales of the firms who trade internationally. Secondly, we provide novel proof of relevance of the destination market structure by showing that firms indeed mimic the currency choice of their competitors. On the whole, the results of this paper support the "bargaining over invoicing" theory, which indicates that increases in firms' export size change the buyer's and seller's preferences over currency invoicing.

Keywords: currency pricing, strategic choice, pass-through, transaction data, export data, vehicle currency, emerging economy
JEL classification: F1, F4, C33

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1 Introduction

The recent expansion of the world trade has positioned many questions in a new scope. The questions on how exporters decide on the currency for their activity, which motives lead them to their preferences and how it affects their activity, has been granted an increasing attention of many scholars and policy-makers. The currency choice channels the uncertainties faced by the producer and the customer, determining who and to what extent gets exposed to the exchange rate risk. Using a unique dataset this paper looks at the relative novel dimension of this question - what role the strategic currency choice determinants play in determining these choices. This paper defines the strategic currency choice determinants as those resulting from either competition or bargaining side of international trade. The former has been discussed earlier in the literature as the relevance of market structure for the optimal currency choice (Bacchetta & van Wincoop, 2005; Auer & Schoenle, 2012; Goldberg & Tille, 2008a,b), whereas the relevance of the bargaining motives for the currency choice is a new concept (Goldberg & Tille, 2013) and has yet to be explored.

The bargaining theory of currency invoicing[1] concerns with the fact that every international trade transaction is a result of a contract which is being negotiated over three dimensions - price, quantity and currency. Among the three possibilities of currency pricing: PCP - "producer currency pricing", LCP - "local currency pricing" and VCP - "vehicle currency pricing" - the first two are bound to the economies of the seller and the buyer respectively, whereas the third one represents the choice of a currency of a country that is not participating in the exporting contract. The most popular VCP currency is USD, while the discussion of the reasons of the use of USD in international trade goes back to Bretton Woods system, the consequences of the hegemony of the USD in international trade came much later when the data became available.[2]. The application of the unique dataset of the transaction-track decisions of the currency choices of the Russian exporters allows us to shed light on the role of the strategic motives in currency choice in the domination of the VCP pricing (and therefore, USD) in international trade.

By utilising the most recent research on currency invoicing Bacchetta & van Wincoop (2005); Goldberg & Tille (2008a,b, 2013) we build up a framework for the test of the currency pricing determinants of Russian exporters. As we have firm identifiers, we are able to investigate in a greater detail the realisation of the strategic motives. By contasting the aggregate test to firm-level, this research establishes different directions of the strategic considerations at different levels. When a country has greater bargaining power, the transaction is more likely to be priced in the currency of the trading partners - PCP or LCP; when a firm has greater bargaining power, the application of the VCP is more probable. Along with the fact that we a persisent result of VCP being applied for the relatively cheaper sales, it supports the theory of "bargaining over invoicing", theoretically formulated by Goldberg & Tille (2013). For the bigger sales the seller will be willing to give up the initial preference of the domestic currency and take more exchange rate risk, as he cares less about the marginal profit for the greater sell. We find the result being robust to when we control together for the country and firm seller bargaining powers, which means it is important to take into account the fact that the currency choice is actually being determined at the firm level. This finding also implies that there will be different currency pricing behavior in the industries that have many or few exporters that do many or few transactions - therefore there will be different transmission of the exchange rate shock between these industries.

Another result of looking into the strategic currency choice with the information on the firm

[1] Terms "currency pricing" and "currency invoicing" are used interchangeably, as for overhwhelming majority of the exporters, as documented in the example of Sweden (Friberg & Wilander, 2008) the currency of the contract, the currency of invoice and the currency of settlement - therefore the actual currency recieved - is the same.

[2] Grassman (1973, 1976) was the first one to document the data on currencies used in international trade, but the data limitations drove the result of the conclusion that the advanced countries use the currency of the exporter. The later works Friberg (1998); Fry & Harris (1996) and the country cases Friberg & Wilander (2008); Ito *et al.* (2010) have all challenged this conclusion by finding much more intricate conclusions

identifyers is that we are able to observe the firm-level "coalescing" behavior: the firms tend to mimic the currency pricing that is being applied by its competitors. The more diversified is the portfolio of the competitors, the more likely is the exporter to diversify too.

In general, this research is also connected to the literature on the exchange rate pass-through: the low exchange rate pass-through of the bigger exporters (Berman *et al.* , 2012) may be explained by their higher application of VCP. When there is more VCP used in trade, the reaction to the destination-specific exchange rate shock trivially goes down.

Some recent survey studies on currencies in international trade (Ito *et al.* , 2010; Friberg & Wilander, 2008) established that VCP is more dominant than anticipated by the theory. The research of Goldberg & Tille (2013) have formulated framework that connects the currency pricing to the contractual nature of international trade. In contrast to their two-choice model, this paper brings these theoretically anticipated strategic determinants into the real data with the three choices that are available to the exporters.

The currency pricing of the transactions matters a lot at the firm level: the exporter is exposed to different exchange rate fluctuations, that might eliminate the profits of the transaction whatsoever; the importer still needs to convert any other currency into its domestic since that is (generally) the currency in which the good is realised at the domestic final consumption. It also matters as the sum in the aforesaid currency will take time to arrive to the account after the deal was signed and the good is shipped (Samiee & Anckar, 1998). Brol *et al.* (2006) show that different elasticities of risk aversion for exporters can channel the exchange rate shocks differently, resulting in gains and losses in utility from the same exchange rate shocks for different firms.

We find that strategic motives - namely, the motives resulting from the two contracting parties of the trade transaction having bargaining power over decision on the currency of the transaction - are realised differently on aggregate and firm level.

Both the empirical and theoretical frameworks have addressed several dimentions of the currency choice determinants and implications, but they have all fallen into the domain of either micro-determinants or macro-determinants. In our research we concentrate on the relatively new set of the determinants described above - strategic determinants of the currency choice. While the strategic determinants are the main concern of this paper, we still control for other type of currency choice determinants - both macro and micro.

In order to further exploit the firm-identifiers, we also try to control for not only the within firm variation of the currency choice, but also heterogeneity of firms. By looking separately at the subsamples of the big and small exporters as defined by the number of the product-destinations, we find that the smaller exporters drive the higher probability of the application of the trading partners' currencies when the country's bargaining power is greater, and the bigger exporters are more likely to switch to VCP when they have greater seller bargaining power. At the same time all types of the exporters tend to use VCP for the relatively cheaper sales. These findings confirm that in estimating or forecasting the effect of the exchange rate shock it should be accounted for the fact that currency choice is being implemented by individual firms - therefore the composition of the industry should be taken into account.

Therefore, for the sake of the policy application, the importance of strategic determinants should be taken into the account, since they are an important part of the currency choice decision of the firms, and can potentially explain the dominance of the USD in the international trade.

We find that strategic determinants, as proxied by the interaction of the bargaining powers of the contracting parties are playing important roles in the currency choice international trade, as in the three-choice world their realisation can increase the application of the VCP in international trade.

On top of showing the importance of the strategic currency choice determinants, we find that the existence of the VCP should not be disregarded both in the empirical and theoretical domain as, for such emerging economies (in our example Russia) and for majority of developing countries, vehicle currency pricing is the main applied choice of the exporters. The strategic motives, availability of the VCP, along with few destinations where many exporters act, may increase the use of VCP even more, making exporters exposed to the non-destination related exchange rate shocks. This implies by-turn that many exporters are opened to the monetary shock that is not coming from either their domestic economy nor their trading partners.

As we find evidence that the increase of bilateral country trade increases the usage of the

currencies of bilateral partners in exports, implies that the agreements that were signed in order to alleviate the relience on the VCP will have the desired effect in just some industries - namely, where the countries have many exporters engaged in the bilateral trade.[3]

In this paper we present a unique three-choice test on the firm-level data, which up to our knowledge, has never been done before. Till present moment both economic theory and empirics - with the notable exception of (Goldberg & Tille, 2008a,b) - was either limited to considering a two-choice models, where only the currencies of the trading partners have been at the question, or was overlooking the microeconomic and bargaining motivations.

The paper is organized as follows. Section 2 provides the literature review and discusses the main determinants behind the currency pricing predicted by theory. Section 3 describes the data and documents stylized facts on currency pricing. Section 4 describes the methodology. Section 5 provides the results. Section 6 summarizes the conclusions and discussion.

2 Conceptual Framework and Literature

The exchange rate shock exposure is conditioned on the choice of currency, and the determinants and effects of currency choice has been long debated.

The debate in the macroeconomics field has determined the importance of currency choice in a number of relevant questions, such as - currency choice effecting the volatility of the exchange rate (Betts & Devereux, 1999), alter the optimal monetary policy (Devereux & Engel, 2003) and overturn the predictions of the main economic fundamentals Betts & Devereux (1999).

One of the first recordings of the currency pricing patterns in trade goes back to Grassman (1973, 1976) research who stated the fact that trade of the manufactured goods between the developed countries tends to be invoiced in the PCP. Another finding of the epoch was that trade of differentiated products between developed and developing countries tends to be priced in the developed country's currency was backed up by Page (1977, 1981). Most of the research has been taking the exchange rate variability as the main driving force of application of the diverse currencies by the firms.

The conventional facts first recorded in the literature on currency pricing were found to be challenged in the recent decade when the empirical evidence was acquired. More recent research (Ito *et al.* , 2010; Friberg & Wilander, 2008; Bacchetta & van Wincoop, 2005; Goldberg & Tille, 2008a) has indicated that there should be other considerations accounted for in the currency pricing decision.

The first firm-level studies to look at the currency choice decision at the level of the firm - Ito *et al.* (2010) and Friberg & Wilander (2008) - indicated that Japanese and Swedish exports were not following the so-called "Grassman law" of currency pricing and the question of the currency pricing determinants was once again put on the table.

Altogether, the proposed determinants can be summarized in the three groups: micro, macro and strategic. This paper concerns with the latter group of determinants, but nevertheless this section also presents a brief overview of the other two.

Macro determinants

One of the big questions of currency choice in international trade is the high presence of USD in trade between the countries that do not trade much with the United States[4]. This question is addressed by Rey (2001) as prevalence of a single currency ("vehicle" currency) in international trade being the result of the **low transaction costs** of the aforesaid currency.

In the recent years the importance of the destination market structure has been raised as an important determinant of the currency choice. The influence of market-structure related parameters was combined into the notion of **coalescing motive** of currency choice by Goldberg & Tille (2008a). The rationale behind is that to insure the most stable position in the destination market

[3]This has been a clause, and more recently a goal of the signed treaties between almost all BRICS, and other developing and emerging countries such as Kazakhstan, Australia, United Arab Emirates, and in process (as in October 2014) those of Japan, Turkey, Iran.

[4]see, for example, Wilander (2005); Ito *et al.* (2010); Goldberg (2005)

a firm needs to mimic the portfolio of currencies that is used on the destination market of the certain good by other firms.

The "coalescing" motive can be illustrated on the fact that homogeneous goods - goods that are relatively easily substituted within brands like wheat, rice, coffee - are world-widely priced mostly in USD Grassman (1973); Goldberg & Tille (2008a,b); Novy (2006).

Volatility of the exchange rates appears to be one of the obstructing forces in international trade, though some research has found mixed evidence of the magnitude of the effect (**?**). It is important to take into account fixed exchange rates and other special arrangements on the exchange rate regimes, as they have different transmission of the exchnage rate shock**?**.

The most recent research deals with the special arrangements of payment systems between the countries **?**. The availability of the payment systems aimed at the currency settlements between firms in Argentina and Brazil effect the currency pricing making them more likely to apply bilateral trading partners' currencies.

Micro determinants

Most of the micro literature is concerned with the exchange rate channelling effect of currency choice. The exchange rate is repeatedly indicated as having a significant impact on the international trade (Hericourt & Poncet, 2012), that may be different for heterogeneous exporters (Berman *et al.* , 2012), but there could exist potential gains from "pooling" different currencies in the firm activity via their risk elasticities (Brol *et al.* , 2006).

The first microeconomic determinant brought up in works of Novy (2006); Goldberg & Tille (2008b); **?** is the intra-firm **hedging behavior**. Firms that use imported inputs use more non-domestic currencies than the ones that produce only from domestic resources. Research on American data of Amiti *et al.* (forthcoming) shows that there is different durations of price-adjustment and exchange-rate pass-through between the non-USD and USD transactions. The importance of the import-to-export currency match for exchange rate pass-through is being tested on Russian data in a follow-up paper to this one Kuzmina *et al.* (n.d.).

The more general statement on **hedging behavior** is that the firms engaged in international trade will choose the currency that has the highest utility in exchange rate movements. It should be noted that with the expansion of the supply chains in the recent decades, some production chains became very tangled and hard to trace, and these co-movements may result in greater likelihood of choosing the vehicle currencies such as USD and EUR.

One should note that the exchange rate movements could be financially hedged against, but as research of Martin & Mejean (2012) showed, even in such developed and internationally active economies as France, only some [biggest] firms implement financial hedging and only to some transactions. Therefore, looking at the economy of Russian Federation, this paper assumes that there is no financial hedging implemented by an average exporter.

Ito *et al.* (2010) showed that there is different currency pricing implemented between the firm and its affiliates and other companies, as they follow their own arrangements in payments.

One of the working microeconomic results used as an assumption in this paper is that there is the currency set for the invoice is the same that is used for settlement. This was true in overwhelming majority of the firms in research of Friberg & Wilander (2008) and therefore is assumed to be an appropriate assumption.

Strategic motives

Strategic motives deal with the bargaining and competitive nature of international trade.

This strategic motive takes form of the outcome of interaction of **bargaining powers** of the trading parties on the market. The most recent research (Friberg & Wilander, 2008; Goldberg & Tille, 2008a,b, 2013) indicated that the conventional idea of unilateral exporter bargaining power over the currency is faulty, as both the actual contract is being bargained over (price, quantity, currency) combination and therefore both the bargaining powers of the importer and exporter are considered when making a decision on the currency. If bargaining powers are asymmetric and parties have different preferences, the currency choice is being determined in favor of the party holding higher bargaining power, and therefore can be not-optimal for the second party. On the

terms of the transaction, the bargaining power determination comes down to two aspects: relative importance of the importer to the exporter, relative importance of the exporter to the buyer.

Building on the insights of the current research, this paper differentiates the existence of the aggregate (**country**) and individual (**firm level**) bargaining powers:

- Bacchetta & van Wincoop (2005) has indicated the higher presence of the domestic firms at the destination overturns the optimal pricing decision. Therefore when an exporter is trading to a destination where the home country is the major importer, it will hold higher bargaining power over the the currency choice.

- Bargaining model of Goldberg & Tille (2013) points out that as the volume of importer's purchases grows, the importer gains higher bargaining power over the currency determination, as she represents higher share of the exporter's sales.

The differentiation between the existence of the two different types of bargaining powers allows to get an important result of this paper: the bargaining powers on each level are realised differently.

Goldberg & Tille (2013) is the first paper that is encorporating the firm-level bargaining framework into the currency choice. Apart of having a two-choice models that neglects the existence of the third choice, another assumption of the model is that there is no effect of the production of products for every transaction on the marginal costs of production of others - meaning there is no spill-over from the production for each of the contracts. These assumptions allow the model to be trackable, but they may oversimplify the reality. In our empirical investigation we argue that it is important to look at the more aggregate situation while looking at the firm-level determination.

Looking at the data on industry level is more widely used as it is more applicable for policy determination and, additionally, the industry-level data became available earlier. We use the results of the two-choice model of Bacchetta & van Wincoop (2005) as the motivation for our test: when there is greater presence of the home companies at the destination, the currency choice of an individual firm may be changed.

This brings in another part of the strategic bargaining arguement - the domestic competitors' presence at the destination. As Bacchetta & van Wincoop (2005) argue that high home presence leads to a different optimal choice, this leads not only to consideration of the "domestic" presence, but also the "domestic competition" presence: a firm observes the home competitors selling at the destination, and this can effect the currency choice. This is partially linked to the "coalescing" behavior, but deals with the more competition-enforced determinant. We assign **firm-level "coalescing"** into one of the strategic currency choice determinants.

Foresaid studies has majorily lacked either the availability of the third - vehicle currency - choice or consideration for the fact that the actual decision over the currency is done at the firm level. This paper attempts to address both of these shortcomings in the current scientific literature and shed light on the determinants of the currency choice. The main contribution of our paper is that the strategic determinants are not only relevant for currency choice, but also - due to different realisation at thecountry and firm levels - may be partually accounted for the high presence of the vehicle currencies in international trade.

All in all, the strategic determinants of the currency choice sums up to three parameters:

- the country bargaining power: home presence can influence the optimal currency choice for individual transactions

- the firm bargaining power: relates the bigger size of the purchase to greater willingness to accept risk due to lower marginal risk

- the firm-level "coalescing" effect: the diversification of portfolios of competitors leads to a given firm's greater diversification

Utilizing the unique type of data - the transaction track decisions on currency choice with unique firm identifiers - this paper presents a sophisticated test on the strategic currency choice determinants, and highlights the importance of the startegic determinants, as they are realised in the different way at the country and firm level. This indicates the need to take into account the firm-level currency decisions when investigating or assessing currency denomination related questions:

the same aggregate policy may trigger diverse firm-level response, making the transmission of the policy different.

This section has presented the literature survey and outlaid the main theoretical motives that have been formulated for the currency choice in international trade. Special attention is paid to emerging literature and rationale behind the strategic currency choice determinants. The next session we describes the data that is used.

3 Data

3.1 Data sources

The main source of data is Russian customs database with population of transaction-level information. The information reported is transaction per firm, per product[5] (10-digit HS), per destination. Per each transaction the value is reported along with the specific currency of the transaction.

We can observe the identifier of the firm (or a phisical person, but those observations are dropped for our research) that is performing the export transaction. We concern ourselves only with the products that are originated in Russia. We have to admit that due to the absence of the customer identifiers, we can not observe if the transaction is a part of a sell to the same buyer or a part of the same contract. We assume that every transaction is a separate contract with a separate buyer, and leave the search for a better investigation to when a better data appears.

For one of the robustness checks we keep 40 most popular (either by count or by value) destinations in our dataset, which account for over 90% of trade. Filtering rare destinations could potentially take care of a mutual lack of liquidity faced by the trading parties when performing a selling to one of the filtered destinations, and the exporters/importers cannot get easy access to (or dispose quickly) the currency. The choice of the exporter is then effected by the inability to go for LCP and PCP, whereas the main goal of this study is to investigate the relation between these choices.

For the main test results we keep the population of transactions, but omit oil and gas industries of the Russian exports for the robustness check.

All transaction values are converted into the US dollars for compatibility. The conversion is done based on the monthly average exchange rate. As the average time to export for Russian Federation is 10 days (reported by Doing Business Report 2011), so averaging the exchange rates for a month should not be a source of bias. In case there was recorded a correction to the registered value of shipment, the correction is added to the value based on the exchange rate in the month that the correction has taken place[6].

Some shipments are excluded from the data investigated, as there is no country of destination reported, private (physical person) is exporting, incorrect tax payer number is stated or the currency of the transaction is not reported. The exclusion constitutes to about 13% of the transactions, roughly evenly distributed within the observed period. Also the transactions below 500USD[7] are disregarded if they are not a part of the series of the transactions of the similar size.

We omit July and August 2007, as the data quality for these months was very low, and relatively only few observations were left after cleaning in these months.

We omit the HS2 industries for which there are less then 1000 transactions reported in the cleaned dataset. This is done in order to satisfy the variation requirements in estimations.

Country-specific macroeconomic variables - GDP, inflation, CPI - are taken as reported by the World Bank, the Penn World tables and IMF IFS.

The exchange rate variation is calculated based on the monthly averages computed on the data provided by CBR (Central Bank of Russia). The exchange rate reported by the CBR might have a slight difference with the market one, but captures daily fluctuations to full extent.

[5] Using the 6-digit universal HS, Russian firms report 10-digit classification system TNVED, which provides more descriptive information of the product

[6] The correction of the customs declaration deals, as according to the specified law and regulations, with the incorrect filing of the declaration, changes in contract attributes, returns, and other circumstances which deal mostly with transportation and contractual obligations on delivery.

[7] This is an commonly used value that represents the need to discard the single "sample" transactions.

We currently do not restrict the sample to manufacturing, therefore we include wholesalers.We leave the manufacturing industries selection to the robustness checks. We omit transactions recorded as "re-export" as they are likely to be the exports of previous periods that got returned. We take advantage of the population dataset of roughly 10,9 mln transactions over the period, which after the appropriate cleaning is reduced to 8,5 mln observations. The loss of information is not found to be due to any other reason but strategic[8] purpose of the trade (therefore non-disclosure of information) or the information input error. Some data entries had to be omitted as there was no relevant entry in COMTRADE at the destination even for HS4 level. The general correspondence with COMTRADE imports is around 95%. The database covers the population of all individual export transactions from Russian Federation between the 1st January 2005 and 31st December 2009.

3.2 Data breakdown

Table 1 represents the exports decomposition by region in value over the whole observed period. The main export destination is EU with 92.03% of exports being basic metals and minerals. In general, the exports of basic metals and minerals are overwhelming majority of total exports (about 85%). This seconds the conventional knowledge that Russia is an resource-exporting country. By count decomposition Table 2though presents CIS (Commonwealth of Independent States) as a major export destination of Russian exporters (44.62%) whereas the EU accounts only for 15.90% per cent of transactions by number.

This fact represents the long-established relations between the "Soviet Block" countries as a much higher number of the smaller transactions from higher number of exporters exist for them, whereas with the big advanced economies the majority of the transactions are less frequent but are of much greater value coming from the big exporters.

The rightmost column depicts the industry decomposition of Russian exports. The decomposition by value is highly skewed toward the "basic metals and minerals" category, whereas by count it compiles to less than 24%. This represents high value added of the exported goods. Notably, except for the same pattern is being represented in the exports of machinery (1.72% by count and 11.30% by value), all other industries show an opposite pattern.

Table 3 depicts the Currency and Currency pricing decomposition of the Russian exports. From the composition of the Currency pricing it is noticeable that Russian firms prefer to apply VCP for the bigger transactions. And as the most used currency is USD which represents the same pattern in count/value ratio, we can draw a conclusion that USD is the main exporting currency for Russian exporters. Another distinctive feature of the data is that Russian rubles are systematically used for the lowest-value transactions - average count of 34.41% sums up to only 3.16% value on average. This can mean that smaller exported amounts are most likely to be priced in home currency, reflecting possibly the risk-aversion patterns in behavior of small exporters and their higher bargaining powers. LCP transactions present about 10% of the transaction counts on average and 12.64% on average of exports value. It is more inferential to discuss LCP when referring to Table 3 .

In Table 3 we present the size and percentiles distributions of currency pricing by average size and average count among the exporters of different size. Firm size is counted through counting the number of product-destination pairs for each firm. Quarter of all the firms interacts only with one product-destination, which supports the common knowledge of empirical trade. The median number of product-destination pairs is 4. We fix our further selection between "big" and "small" at 75th percentile and 11 product pairs. From Table 3a and Table 3b we record several evident and distinctive features of the data:

- Small exporters use LCP more frequently than big ones.

The fact that small exporters are using LCP more frequently than the big ones, is a novel evidence. Prior the evidence stated that LCP is more likely for the big exporters Martin & Mejean (2012). In our model we treat each transaction as a separate contract, therefore more frequent use of LCP by small exporters implies that they have higher number of customers which they choose to serve

[8]Precious metals and goods of strategical value are excluded. Services are also not recorded.

in LCP. This could be supporting evidence to the bargaining motive, as small exporters face lower bargaining power versus their customers.

Controlling for the sizes of transactions[9] (hypertargettable3 we also find evidence that LCP is indeed more present in the smaller transactions. The other two distinctive features of the same selection are concerned with VCP and LCP ratios between big and small transactions. Consequently, we can see that over 90% on average of the big transactions are done in VCP, whereas the count share is roughly similar to the small transactions. This finding can contribute to the empirical findings on the exchange rate pass-through: most of the big exporters do not exhibit high exchange rate pass through after the destination specific exchange-rate shock as they do not suffer the same shock as the small exporters: their currency pricing basket is more dependent on the VCP, which is quite unlikely to be affected by the local currency exchange rate shock.

- There is some correlation between the size of the exporter and the relative number and size of the transactions the exporter is doing.

On one hand this is supported by the Melitz model theory that indicates that the more productive exporters surpass the cut-off further (or to multiple markets) and are able to sale more at lower prices. But on the other hand, even though the total sales for bigger exporters increase, the average size of the shipment becomes smaller (true for LCP and PCP), while the number of shipments increases. This means that the exporter serving more than one destination is better off shipping more but smaller shipments than one serving one destination. And, as the average size of VCP is increasing by the percentile of the firm size, there is a higher preference for VCP for bigger transactions, which results in the following observation:

- There is a high and increasing usage of VCP for the exporters all types.

According to the existent theory, VCP is used more for homogeneous goods than the heterogeneous goods. The currency that is used as a "vehicle" currency is usually commonly accepted as a transaction currency and generally requires less cost for the exchange than LCP or PCP for the bilateral trade (Rey, 2001). Nevertheless, using VCP implies third-party exchange rate risk exposure, that can affect the trade. If countries A and B "over-use" VCP in their trade, they can get exposed exchange rate shocks that are not generated in countries A and B and the trade will be effected. At the same time, it secures the bilateral trade if the VCP is more stable against the currencies of the both partners than their common bilateral exchange rate.

In the next section we aim to get understanding of the described above empirical patterns and test if the currency pricing matters for the success of the individual exporters. We first provide the results for testing the existent currency-choice trade model of Goldberg & Tille (2008a), than we increase the dimensionality of the test by utilizing the data-specific characteristics. In the third part we introduce a small firm-level empirical test on importance of the currency pricing portfolio on the success of the exporters.

4 Methodology

This section first provides the specification of the main model in general terms. Then explicit explanation of every variable in question is presented, with some fuller explanations in the Appendix.

As explained above, this paper is taking after Friberg & Wilander (2008) research results the same currency for the transaction, invoicing and settlement is assumed - referred to as "currency pricing" or "currency invoicing" interchangeably. This assumption of common currency for three different operations is intuitive, as for most of the cases, the firm invoices in the currency set in the contract and receives the payment in the currency written in the invoice, which (in most of the cases) is replicating the currency written in the contract.

Each firm is indexed with f, exporting good (HS6) i to destination j in period t, k is the subscript for currency, where $k = (e, v, d)$, where e is PCP, v is VCP, and d denotes LCP. When we refer to a currency k on the firm- or industry-level it refers to any combinations of currencies used in the export activity, where corner solutions would be to price completely in VCP, LCP or PCP. The data suggests though, that all industries (HS-6 level) use at least two currency pricings.

[9] Here we are referring to the median transaction size.

As there are in most of the cases multiple transactions of the same good from the same exporter to the Index tr is the transaction index, as there would be multiple transactions to a destination of a same good from the same company in the same currency. We drop the time subscript for the brevity.

As currency choice consists of three possibilities, Multinomial Logit Model is used to test the relevance of the currency pricing determinants. The left hand side of the all the tests performed represents the mutually exclusive choice of the currency pricing. Therefore, the dependent variable is a categorical variable, where choice curpricing=0 represents producer currency pricing PCP, curpricing=1 represents local currency pricing LCP and curpricing=2 represents vehicle currency pricing VCP. There is no order dependency, and the values represent the mutually exclusive exhaustive choice.

The simplified version of the multinomial logistic regression takes full form of:

$$log\,(Pr(PCP, LCP)) = Strategic_determinants + Micro_determinants + \\ + Macro_determinants + \delta_t + \lambda_d$$

Full multinomial logit specifications for the different tests with full list of variables could be found in the Appendix.

To capture within industry correlations all regressions are run with the industry and year clustered robust standard errors on time-industry (year-HS6 level). Changing clusters to HS4-year does not change the results, so we prefer to stay at the more disaggregated level of HS6. Time dimension of clusters is taken at the year level, with time fixed effects entering the regression on the yearly level too. The level of aggregation provides us with sufficient number of clusters, which increase the estimation precision. Reduction of time-aggregation of clusters to a month does not provide sufficient changes to the results, but incommensurably increases the process of estimation.

All estimations are performed with Region-Income fixed effects instead of Destination fixed effects, except for the robustness check with 40 biggest exporting destinations. This is reasoned by the fact that in order to get the variance matrix symmetric and non-singular, we need to drop too many observations, which reduces the descriptiveness of the results. We though acknowledge the fact that destination fixed-effects would be a better specification, therefore we perform the robustness check with only 40 major destination.

For all multinomial regressions we chose the reference group of the VCP pricing (curpricing=2). The choice is done in favor of VCP as a reference group, as it captures more the effect of the determinants on the trading partners' economies, which are characterized by LCP and PCP. The motivation on choosing VCP as a reference category is the following:

- Theoretically the domestic currency is preferred by each party;
- Strategic determinants are formulated for the buyer and the seller.

This paper concentrates on the application of the strategic determinants of currency choice and asks a question what are the drivers of the contratcting parties to use the VCP (in most of the cases USD or EUR) for their export transactions.

The coefficients in the result tables represent the loglikehoods. The positive loglikelihood (relative risk ratios reported upon request) indicates that the increase in the according variable by 1 unit has positive log likelihood effect on applying one of (be it LCP or PCP) the trading partner currencies. The negative sign on the significant coefficient therefore indicates the lenience to VCP when the variable is increasing.

Table 4 presents the full set of variables used in the estimations. The subsections below describe the construction of the variables.

Table I: Summary of the main currency choice determinants and proxies for them

Currency choice motives		Country-level variables	Firm-level variables
Strategic determinants	Seller Bargaining	$Importshare^{i}_{d,t}$	$Seller_barg^{tr}_{f,d}$
	Customer Bargaining	$Cust_barg_ag^{tr}_{i,d,t}$	$Cust_barg^{tr}_{i,d,t,f}$
			$dAboveMed^{tr}_{f,d,t,i}$
			$Diversification^{i,d}_{t}$
Micro determinants		$USDhedge_{i,t,d}$	
		$EURhedge_{i,t,d}$	
		$Importintensity_{hs2}$	
Macro determinants		$Walrascon^{i}$	
		$Refcon^{i}$	
		$Eurozone_{d,t}$	
		$Coefvar_{t,d}$	
		$Year_{t}$	
		$Destination_{d}$	

The subsections below describe more thoroughly the construction of each variable.

On top of having the two-level test, we also split the sample for all regression based on the median size of the exporter - three product-destination pairs (when we drop the one-time exporters from consideration, the median number of product-destinations rise to five, but the results remain unchanged). Using this split allows us to discuss whether the determinants are realised in a similar manner between small and big exporters; this consideration is very important due to the non-linear distribution of the exporter sizes in international trade, with more than 60% on average serving one destination or one product(Melitz & Ottaviano, 2008).

4.1 Macroeconomic determinants

As we are looking into the exporting of Russian exporters, we assume that the transaction costs are same for all the exporters, as we control for the common time-variant characteristics through including the time-dummies $Year_t$. For the robustness check we drop the financial crisis period and look only into 2005-2007.

The coalescing motive is build after Goldberg & Tille (2008b) by constructing a set of dummies according to the Rauch (1999) classification (based on the level of elasticity of substitution): organized exchange traded, reference-priced and differentiated goods[10].

We hold homogenous goods as a reference category for the the dummies $Walrascon^{i}$ and $Refcon^{i}$ for the walrasian goods and reference priced respectively.

Destination is a dummy that captures the Region-Income level aspect of the destinations in the data. We use the World Bank classification of countries to build these dummies.

$Coefvar_{t,d}$ represents the volatility of the destination currency versus the national currency. The theoretical claim is that the higher is the volatility at the destination, the less likely the exporter to use LCP. The measure is calculated through the variation coefficient in order to dispose the level effects. It is constructed as a rolling coefficient for quarters based on the previous four quarters over the daily reported values[11]. As a robustness check we also perform a rolling coefficient over a 2-year window.

[10]Due to the differences in the composition of the markets of the relevant goods, the goods traded on the organized exchange market would appear to be mostly homogeneous, and for them the price is the main attribute when making a purchase. The reference priced goods are the ones that do not have an organized exchange market, but are close substitutes. The traders can find a reference for the price, and find a seller with the cheapest price, without being overly concerned about additional characteristics. For the differentiated goods the specific characteristics of the product, quality, the "brand" will matter more, leaving the producer with higher price-setting power.

[11]The daily reports on the exchange rates are taken from the Central Bank of Russia, therefore they capture the face-off dynamics of the rates for the firms

$Eurozone_{t,d}$ is a dummy indicating the EU country. Cyprus, Slovenia and Slovakia have entered eurozone within the observed period, therefore variable is time-variant. Denmark has both EUR and DKK assigned as LCP.

As we do not have the Import Intensity by industry of Russian exports, we construct *dummies* for every HS2 category in order to control for how much imports on average is needed for the industry. The assumption here is that the industries that require more imported inputs would be more likely to use currency other than domestic currency. This may be looked at in the framework of the back-and-forth trade where the exporter would use a currency of a country where she gets it imports from so that to "absorb" the exchange rate fluctuations into their cost structure. We leave it to the future research with better data to investigate the question more thoroughly.[12]

4.2 Micro determinants

The hedging motive is tested through constructing $USDhedge$, $EURhedge$. All dummies are constructed for each 1-quarter period and take value of 1 when the currency (USD or EUR) is a better hedge than the others. Therefore, $USDhedge$ will take value of 1 when it is a (statistically significant) better hedge in the given period than $EURhedge$, which then has a value of 0 for the relevant period[13].

We concern ourselves only with the two hedging currencies - EUR and USD, as they are the most popular vehicle currencies (85% VCP in the observed period accounts for USD, 14% to EUR). We do not add destination-country-specific measured hedging variable, as we other currencies are used as VCP in less then 2% of the cases.

It should be noted that we exclude the consideration of financial hedging only to discussing it in the conclusions of the paper. We assume there is no financial hedging done, as it has been documented that even in the economically developed countries financial hedging is used only for some of the big transactions by some of the big exporters (Martin & Mejean, 2012). Considering the Russian exporters, there is a suspicion[14] that when financial hedging is employed, it is employed majorly in the transactions between affiliates (or branches), therefore is applicable only to a very limited number of firms.

4.3 Strategic motives

As explained before, the strategic motives capture two aspects of international trade: competition and bargaining. First we introduce the construction of the variables that proxy for the bargaining part, and then explain the construction of variables that measure competition.

Conventionally, the currency choice determinants have been regarded at the aggregate level. Utilizing the information on the firm identifyers we construct the bargaining variables not only at the aggregate, but also at the firm level. Testing the established theories on the real data we find that the bargaining variables have different direction of the effect at the aggregate and firm level.

The bargaining powers are split in two possible ways: relative power of the seller to the buyer and relative power of the buyer to the seller. We construct the aggregate proxies for the bargaining power as in Goldberg & Tille (2008b). $Cust_barg_ag^{tr}_{i,d,t}$ acts as the aggregate measure of customer bargaining and represents the share of the transaction tr in the total exports of Russia (to all trading partners) of product i in year t.

$$Cust_barg_ag^{tr}_{i,d,t} = \frac{transaction_value}{total_export^{i,t}}$$

Since we see every transaction as a separate seller (we do not have buyer identifyers), value 1 of this measure means that there was only 1 customer (transaction) in the given year t for exports of product i. Theoretical assertion is that the bigger transaction will represent a bigger customer, who has greater bargaining power and therefore will have greater bargaining power - most likely switching to LCP, since its his domestic currency.

[12]The question is explored on the data with import side in a companion paper "Passing on the Pass-Through".
[13]See Appendix for the description of the construction.
[14]Based on the talks with real exporters.

The seller bargaining power $Importshare^{i}_{d,t}$ at the aggregate level is calculated as the share of HS6 imports of Russia at the destination.

$$Importshare^{i}_{d,t} = \frac{\sum_{f}\sum_{tr} transaction_value^{i,d,t,f,tr}}{total_import^{i,t,d}_{COMTRADE}}$$

This measure will be high at the product-destinations where Russia is one of the main suppliers - for example, Russian Federation supplies over 60% of European gas, and therefore the bargaining power in Europe of Russian exporters who sell gas is greater then those who sell cars.

Exploiting the firm identifiers we are able to construct similar measures at the firm level: Variable $Cust_barg^{tr}_{i,d,t,f}$ represents the transaction share in the firm sales and is calculated as the relative share of the transaction in firms' export of product i to the destination d in year t [15]. If a firm has only one customer at a given destination, then he faces high customer bargaining power and is more likely to apply the currency according to the customer bargaining power.

$$Cust_barg^{tr}_{i,d,t,f} = \frac{transaction_value^{i,d,t,f,tr}}{\sum_{tr} transaction_value^{i,d,t,f,tr}}$$

The bargaining power of the specific exporting firm to the buyer is measured through $Seller_barg^{tr}_{f,d}$ which represents the share of all firm's exports to the destination in the total imports of the product at the destination.

$$Seller_barg^{tr}_{f,d} = \frac{\sum_{tr} transaction_value^{i,d,t,f}}{total_import^{i,t,d}_{COMTRADE}}$$

For all the variables the total imports of the product to the destination d are acquired from the COMTRADE database.

Therefore we have different set of variables for the aggregate bargaining measure ($Cust_barg_ag$ and $Importshare$) and firm-level bargaining measure ($Cust_barg$ and $Seller_barg$). This allows us to contrast the realisation of the bargaining determinants at two levels.

As we have explained earlier, the currency choice is done as a part of the bargaining of the firm in a contract. The bargaining is done over three dimensions: $(price, quantity, currency)$. The theoretical framework on the relation of the parameters is scarce in the literature [16]. To capture other characteristics of specific contract we build a dummy variable $dAboveMed^{tr}_{f,d,t,i}$ which takes a value of one if the given transaction tr is higher then the median unit value of the sale of the specific exporter. Unit value is constructed as ratio of price to quantity, therefore the greater it is, the more expensive each unit of the sale is. By using unit values we can cross-compare different products of the same exporter and different exporters.

Referring to the bargaining setup of the contract, we can assume that sales that are more expensive than the median unit value are representing smaller sales. In the bigger sales the average price is lower since the seller is willing to compromise the marginal profit for the sake of getting greater total profit. Therefore $dAboveMed$ is one for the smaller sales[17].

As we are able to track selling firms, we are able to reflect on the competitive aspect of the currency pricing. The **coalescing** determinant refers in the ability to mimic the currency pricing portfolio. We argue that there is "mimicking" at the firm level - the firm observes the behavior of its competitors, and therefore if the competitors diversify, it diversifies too. To capture the firm-level mimicking of the currency pricing portfolios, we build a variable $Diversification_{t}^{-f,d}$ that indicates a greater level of diversification of the competing firms (therefore omitting the one in question) at the product-destination. Further we explain construction of this variable.

$Sharecur_{k,d,-f}$ denotes the share of the currency pricing k used by all *other* Russian exporters to the destination d in the given HS4 industry, where product i is classified, in a period t (year):

[15] As a robustness check we look at $Cust_barg_2^{tr}_{f,d,t}$ - the share of transaction in all exports of the product of the firm. The results remain the same

[16] the notable exception is Goldberg & Tille (2013), but they are bounded in the two-choice world

[17] We leave out of scope of this paper the discussion of the quality aspect of products. For the discussion on the relation of unit values to product quality please relate to Manova & Zhang (2012)

$$sharecur_{i,k,d,-f} = \frac{\sum_{-f}\sum_{tr} transaction_value^{i,d,t,f,tr,k}}{\sum_{-f}\sum_{k}\sum_{tr} transaction_value^{i,d,t,f,tr,k}}$$

Herfindahl-Hirshman Index $HH_{hs4,d,-f}$ is constructed for each firm at each destination-HS4 product pair in a following way:

$$HH_{i,d,-f} = \sum_{k} sharecur^2_{k,d,-f}$$

The diversification measure $Diversification_t^{i,d}$ is formed by computing a reverse index to HH index that shows the concentration of shares per each industry at product-destination:

$$Diversification_{hs4,d,-f} = 1 - HH_{hs4,d,-f}$$

For example, if all competitors of the firm $Pravda$[18] exporting a given HS4 product to Switzerland (d) price their sales in 25% USD and 75% Swiss francs, will get $sharecur_{i,v,-d,f} = 0.25$ and $sharecur_{i,e,d,-f} = 0.75$. Then $HH_{i,d,-f} = 0.0625 + 0.5625 = 0.625$ and $Diversification_{hs4,d,-f} = 1 - 0.0625 = 0.375$.

Value of Diversification index is bounded between $[0; 0.67]$. Diversification at zero implies that all HS4 competitors at the destination do extreme currency pricing and price only in one choice, notably VCP.[19]

The coalescing motive of Goldberg & Tille (2008b) predicts that the greater the diversification of the competitors is, the more diversified portfolio will be.

In the companion paper we investigate the question whether having a more diversified portfolio is more benefitial for the exporters, and leave this discussion out of the scope of this paper.

Dimensions of the Test

The results in the next section are presented in the following order - first we perform an aggregated test that relates closely to the test of Goldberg & Tille (2008b). We check if the same pattern of results will hold for our data. Secondly, we perform the new - firm-level - test, which utilises the firm- and competition- characteristics. We discuss the outcomes of the tests in light of the laid out above theoretical predictions and implications.

After discussing the results of the tests on the strategic component of the estimation, we investigate the interaction between the realization of the strategic motives at the firm-level and corresponding country-specific bargaining power. This is done by using the variables proxying for the strategic motives of the firm-level seller and the buyer and country-level proxies within the same test. This results appear to be an original finding for international economics, as it indicates a novel link between macro-level policies and firm-level decisions on currency choice. Then in conclusions we discuss the further implications of the results and policy relevance.

Brief discussions on the type of robustness checks performed are also reported.

5 Results

In previous sections we have devised an econometric test that is aimed to capture the influence of the strategic determinants of currency pricing as implied by the existent literature.[20] This section describes the realisation of this test on the currency-tracked transaction data of Russian exporters.

As we are performing the multinomial logit regressions, the left hand side of the all the tests performed represents the mutually exclusive choice of the currency pricing with VCP as the reference group. Due to the aplication of the multinomial logit, derived coefficients cannot be represented as elasticities, as they represent the log-likelihood of one of the choices versus the reference group;

[18] Hence the subscript is $-f$, denoting "everyone but the firm in question".

[19] Please refer to Appendix for more explanation on construction of diversification index.

[20] After the data cleaning as described in section 3.

they determine the direction of the influence of the variables on the choice outcome compared to the reference group.

We though utilise the firm-level data on the number of product-destinations served and split the sample by the median number - less than three product-destinations and more than three - naming the subsamples accordingly "small" and "big" exporters. This split allows us to see if there is different realisation of the determinants by the heterogeneous exporters. Table 5 provides the results of the aggregate test, while Table 6 reports the results of the firm-level test of the full set of the determinants on the full population of the currency choices of the exporters. The aggregate test is following the conventional determinants of the currency choice; this test does not take into account the firm-dimension strategic considerations and is similar to the test in Goldberg & Tille (2008b) on Canadian data. The firm-level test utilizes the information on the seller identifiers and runs a similar test but on the firm-level strategic currency choice determinants. As it will be discussed further in more detail, we find different realisation of the strategic motives at the two levels, therefore we built a joint test with aggregate and firm-level strategic variables, presented in Table 7.

The sample size is greater for the aggregate test since there are some destinations lost where there is only one exporter or there is only PCP or LCP applied at the destination (due to the construction of $Diversification$ index, described above and in the Appendix).

In every table columns (1) and (2) the results on the regressions on the full sample are presented, (3) - (6) utilize the information on the size of the firms: [(3) and (4)] on big; [(5) and (6)] on small exporters respectively.

5.1 Strategic currency choice determinants

The principal result with regards to the strategic determinants is that there is different effect of the seller bargaining powers at the aggregate and firm level:

- When a country has greater bargaining power ($Importshare$), the bilateral trading partner currencies (PCP and LCP) are more likely to be used;
- When a firm has a greater bargaining power ($FirmBarg$), the vehicle currency (VCP) is more likely to be applied.

The higher likelihood of applying LCP or PCP is somehow in line with the Bacchetta & van Wincoop (2005) idea of the change in the optimal pricing when there is a higher number of the domestic firms at the destination. When countries trade more, they get more exposed to each other's markets and bargaining power - they start using more of each other's currencies. When we look into the heterogeneous exporters dimension, we find that the result is more robust for the smaller exporters: when Russia is more present at the destination, they use more of their domestic and destination currencies, whereas the big exporters are more likely to use LCP, but not significantly more PCP.

The actual bargaining powers over the contract are realised at the firm-level by the actual selling and buying company. The firm-level test yeilds a different result: when a firm has greater bargaining power toward its customer, it is more likely to use more VCP. This finding can be explained through applying Goldberg & Tille (2013) theory of bargaining over invoicing to the three-choice world: for a bigger sale a firm gets higher on the marginal profits curve and therefore can take more exchange rate risk since the marginal loss is smaller(we operate in the setting of Goldberg & Tille (2008b) with diminishing returns to scale) - it does not prefer the domestic currency (PCP) any longer. The currency of the buyer (LCP) at the same time also less preferred over another possible choice in the real exporting - VCP. When we look into the heterogeneous exporters we see that there is no higher probability of the VCP over PCP for the smaller exporters. This could be explained through the following mechanism: smaller exporters are more bound to their preference to PCP due to the relatively greater dependency on their wage payments (since it represents a greater share of their costs); the increase of their seller bargaining power does not bring them high enough on the marginal profits curve to make them more risk-taking. The bigger exporters, by-turn, lose preference for the domestic and destination currencies in favor of the VCP when their firm bargaining power is greater, exhibiting greater risk-taking behavior.

We find support to our theory when looking into $dAboveMed$ variable: the cheaper sales are more likely to be in VCP. As the cheaper sales in our definition represent bigger contracts - the seller is willing to get lower marginal profit for the sake of total profit of the bigger sale - it implies that the selling firm is choosing the VCP for the bigger contracts, whereas for the contracts where there is high marginal profit it is more likely to choose LCP or PCP. It is notable that this is consistent both across the big and small exporters.

$Diversification$ is indicating the existence of the firm-level coalescing behavior - the firms tend to diversify their currency pricing more the more their direct competitors diversify. It is more persistent for the small exporters.

The results on the customer bargaining power is quite puzzling, but this might be due to the absence of the buyer identifyers, so we leave the inferense on the realisation of the bargaining power till better data is becoming available.

Having two different directions of the seller bargaining power's effect at the firm and aggregate level poses then a question: how are the strategic motives realised when we control for the both of the levels simultaneously? Building a closer fit to Bacchetta & van Wincoop (2005) theory we put the aggregate and firm level seller bargaining variables together: we find that the results remain unchanged and the greater bargaining power of the exporting country makes the application of the bilateral trading partner currencies more likely, whereas the greater firm bargaining power makes the application of the VCP more probable. The results are presented in Table 7.

This is an important finding since it indicates a new channel for assymetry of exchange rate pass through in international trade: the bigger exporters will have a lower pass through due to them using more vehicle currencies in their trade, and the pass through being greater for the countries which trade more. This is in line with the findings of the international trade literature as in (Berman *et al.* , 2012) or **?**, who find lower levels of pass-through for the bigger exporters. Looking into the highly detailed data with currency choice this research sets a novel finding that the bigger exporters choose less of trading partners' currencies preferring some other - vehicle - currency, which would expose them differently to the exchange rate shock at the destination country.

5.2 Other findings

We find that the type of good indeed matters for the type of pricing being applied, as being predicted by other theories: the more diversified the goods are, the more likely non-VCP currencies to be applied. This is more prevalent for the smaller exporters.

Exporting to Eurozone area makes the application of the LCP more likely - since it is the second most popular VCP in the world and is more used. Transactions to the destinations pegged to USD makes the VCP more likely as the most popular VCP currency is USD.

The aggragate test indicated that the greater variation in exchange rate between the exporter and the importer makes them more likely to use VCP, but when we control for the firm-level strategic variables, the higher probability of VCP versus PCP stays, whereas the significance of the LCP to VCP disappears.

Hedging variable does not behave as predicted by the theory, but this may be due to the industry-level construction of it[21] Better hedge in euros and better hedge in dollars increase the likeliness of the use either of PCP or LCP[22]. This indicates that the firms do not really utilize the hedging possibility itself, but might be seeing it as a better "security" for the transaction in other currencies. Notably, Euro is being a significant form of "insurance" for the smaller exporters, whereas the bigger ones are referring to the USD.

5.3 Robustness checks

In Table 9 we present the various robustness checks performed. The full results of the robustness checks are also reported in the Appendix. As it was described in the Data Description part, basic metals and minerals constitute 85% of exports in value. The main results does not exclude this

[21] The more intricate investigation of this motive is performed in the paper "Passing on the Pass Through" (work in progress).

[22] As 85% of the VCP is in USD, we might have some biasedness because of the exports to the USA. Though, this relation remained when we dropped the destination of the USA.

category, but we exclude it for one of the robustness checks. There might particular processes that account for currency pricing during the Financial Crisis that we do not account for. The results hold if we omit 2008-2009 period, which is robustness check "No crisis". The split of the firm size is being done on 75th percentile, as was explained before. This was done due to the fact that the median firm in Russian Federation over the whole period exported only 3 product-destination pairs. We report as a robustness check the results on the split between big/small based on the characteristic if the firm has exported to three or more destinations in a year. The results hold.

Afterwards, in Tables 8a and 8b we use Akaike informative criterion (AIC) and BIC scores to compare explanatory power of the alternative combinations of the variables. For the better representation we omit the results of the unrestricted and empty models for each specification, as they do not produce striking difference from the full specification and perform worse with the AIC scores.

It should be noted that when multinomial logit is run on different samples, the explanatory power of the tests cannot be compared across the samples due to the construction. The comparison of the explanatory power can be done within different specifications over the same sample.

In addition we also perform some magnitude of the effect analysis on the variables of interest.

5.4 Interpretation

This is a new evidence that indicates that signing RTAs could effect the so-called "dollar dependence" in international trade between countries, but this may be conditioned on the export market structure because of the "love for dollar" paradox. Therefore, the higher change is most likely to be observed in an industry where there is more exporters, and the increase in trade between two countries is least likely to affect currency choice preferences in an industry where there is only one exporter.

We find strong support for theoretical predictions on "hoarding" or "coalescing" behavior of the exporters - meaning that the currency pricing depends on the type of goods being traded (as oil is most likely to be priced in USD because there is a centrilized market of oil trading that quotes the spot price) and on the behavior of the competitors at the destination (if all competitors do LCP, the exporter will also apply LCP). This determinant is even more pronounced when we look at it in the heterogeneous exporters framework - smaller exporters are more likely to use their domestic currency which, controlling for other variables, is their truly preferred choice, as their share of wages in marginal costs is presumably higher.

We record evidence that for a country that does not possess one of the most-used currencies in the world, such as Russian Federation, increase in the volatility of the bilateral exchange rate elevate the probability of the exporters to resort to the vehicle currency pricing as a form of risk-sharing in the transactions.

6 Conclusions

This paper addressed the question of importance of the strategic determinants of currency choice in international trade. Strategic currency choice determinants are formed from consideration of the bargaining powers of the contracting parties and the competition influenced characteristics.

Using a unique dataset with transaction-tracked currency choice exports of Russian exporters and exporter identifyers, we find the divergent effect of the realisation of the seller bargaining powers when proxied at aggregate (country) and firm level. The greater country-seller bargaining power increases the probability of the use of the trading parties' currencies (PCP or LCP) over VCP, whereas greater firm bargaining power increases the probability of application of VCP. The realisation is the same when we control for the two bargaining powers simultaeously. It implies, that the transmission of the exchange rate shock will be different between different industries depending on the distribution of the exporters in the industry.

The divergent effect of seller bargaining power on choice of VCP among exporters is a result of the existence of the third choice. While higher presence of the home country at the destination increases the bargaining power for all domestic firms, the higher seller bargaining power makes the seller more likely to take higher exchange rate risk as his marginal profit decreases.

We also find support to the bargaining theory of invoicing by looking at within-firm variation of the currency choice: which currency pricing is applied to the transactions above and below the median value transaction. The relatively cheaper transactions are priced in VCP, while more expensive transactions are priced using LCP and PCP; the smaller sales exporters prefer to have in the trading partners' currencies, whereas the bigger sales they are willing to go for other currencies, since they can take more exchange rate risk for the sake of securing greater total profit.

Another novel observation the paper delivers is the existense of the firm-level coalescing: the more the competitors diversify the currencies they use, the more diversified the firm's portfolio wll be. This supports the theoretical wisdom that the firms are trying to mimic the portfolio of their competitors in order to be exposed to the exchange rate shock symmetrically.

Different currencies applied in international trade channel the exchange rate differently, and therefore the documented low levels of the exchange rate pass-through for the bigger exporters could be due to the bigger exporters using greater amounts of VCP in their trade. The different realisations of the strategic currency choice at the aggregate and firm level indicate that when addressing currency choice - related questions one should consider the industrial composition of the economy in question.

This paper is one of scarce number of papers that have considered a three-choice model of producer currency pricing (PCP), local currency pricing (LCP) and vehicle currency pricing (VCP) - expanding the usual empirical trade approach of bivariate choice between PCP and LCP. The main contribution of our paper is that we show that strategic determinants of currency choice could be one of the reasons for prevalence of the USD in international trade.

Among secondary results the paper finds that facing greater exchange rate volatility firms tend to use VCP as a currency of the transaction; this choice of non-trading parties currency may explain the controversial findings in the literature of the effects of the exchange rate volatility.

we find the positive evidence for "coalescing" among the exporters in their market currency pricing. We also document that increase in the volatilty of the bilateral exchange rates cause the exporters to revert to the VCP.

and the importance of the currency choice for the international trade activity and investigate the motives empirically, looking into implications underlying the currency choice.

Based on the unique data that was never to our knowledge available before, we have therefore investigated the currency choice of the Russian exporters and attempted to improve the understanding of the realization of the existent theoretical motives for the heterogeneous exporters. We document evidence of the role of strategic determinants in currency choice, which is a relatively new theory. The realisation of strategic determinants in a three-choice setting could be driving further the hegemony of the United States Dollar.

By investigating the novel confidential dataset we address a highly complex phenomenon of the currency choice in international economics. Our research indicates that the theory of currency choice is still scarce on capturing in full the determinants of the currency choice, and we rest our case on the importance of the strategic channels that open to the exporters when we consider a world with many currencies.

Even though our article has focused mainly on the empirical investigation of the currency choices of the population of Russian exporters, we believe to have formed a promising avenue for further research in the area of the exchange rates and international trade. We shed light to some aspects of the literature and question some previous findings. We argue that currency choice is an important part of international trade as it affects it directly through transmitting exchange rate shocks, and leads to barriers in trade under certain circumstances. This paper highlights the importance of market structure and strategic considerations in international currency choice. There is a need for further research to understand the formation and impact of currency choice. One of the potential research avenues can include further investigation of the greater use of USD that is being exhibited by the exporters as a result of them getting higher bargaining power and becoming less preferential to their domestic currency. This is one of the future research we plan to undertake in order to capture and understand the complex nature of the currency choice and its effect on the outcomes of economic activity.

7 Bibliography

References

Amemiya, Takeshi. 1981. Qualitative Response Models: A Survey. *Journal of Economic Literature*, **19:4**(December), 1483–1536.

Amiti, M., Itskhoki, O., & Konings, J. forthcoming. Importers, Exporters and Exchange Rate Dosconnect. **9260**.

Auer, Raphael Anton, & Schoenle, Raphael S. 2012. *Market Structure and Exchange Rate Pass-Through*. Tech. rept.

Bacchetta, Philippe, & van Wincoop, Eric. 2005. A Theory of Currency Denomination of International Trade. *Journal of International Economics*, **67**, 295–319.

Berman, Nicolas, Martin, P., & Mayer, T. 2012. How do Different Exporters React to Exchange Rate Changes. *The Quarterly Journal Of Economics*, **127**, 437–492.

Betts, Caroline, & Devereux, Michael B. 1999. International Monetary Policy Coordination and Competitive Depreciation: A Re-Evaluation. *Journal Money, Credit and Banking*, **32:4**(December), 722–745.

Brol, U., Wahl, J., & Wong, W.-K. 2006. Elasticity of Risk Aversion and International Trade. *Economics Letters*, **92(1)**, 126–130.

Cheng, Simon, & Long, J.Scott. 2006. Testing IIA for Multinomial Logit Model. *Sociological Methods and Research*, **35**, 583–600.

Devereux, Michael B., & Engel, Charles. 2003. Monetary Policy in the Open Economy Revisited: Price Setting and Exchange-Rate. *The Review of Economic Studies*, **70**, 765–783.

Friberg, R., & Wilander, F. 2008. The currency denomination of exports - A questionnaire study. *Journal of International Economics*, **75(1)**, 54–69.

Friberg, Richard. 1998. In which currency should exporters set their prices? *Journal of International Economics*, **45**(1), 59–76.

Fry, Tim R. L., & Harris, Mark N. 1996. A Monte-Carlo Study of Tests for the Independence of Irrelevant Alternatives Property. *Transportation Research Part B: Methodological*, **30**, 19–30.

Fry, Tim R. L., & Harris, Mark N. 1998. Testing for Independence of Irrelevant Alternatives: Some Empirical Results. *Sociological Methods and Research*, **26**, 401–423.

Gaulier, Guillaume, & Zignano, Soledad. 2010. BACI: International Trade Database at the Product-Level. *CEPII*, October.

Goldberg, Linda, & Tille, Cedric. 2008a. The Micro, Macro, and Strategic Forces in International Trade Invoicing. *Federal Reserve Bank of New York Staff Reports*, **405**.

Goldberg, Linda, & Tille, Cedric. 2008b. Vehicle Currency Use in International Trade. *Journal of International Economics*, **76:2**(December), 177–192.

Goldberg, Linda, & Tille, Cedric. 2013. A Bargaining Theory of Trade Invoicing and Pricing. **2013-09**.

Goldberg, Linda S. 2005. Trade Invoicing in the Accession Countries: Are They Suited to the Euro? *Pages 357–393 of: NBER International Seminar on Macroeconomics 2005*. NBER Chapters. National Bureau of Economic Research, Inc.

Grassman, S. 1973. A Fundamental Symmetry in International Payment Patterns. *Journal Of International Economics*, **3**, 105–116.

Grassman, S. 1976. Currency distribution and forward cover in foreign trade. *Journal Of International Economics*, **3**, 215–221.

Hausman, J., & McFadden, D. 1984. Specification Tests for the Multinomial Logit Model. *Econometrica*, **52:5**, 1219–1240.

Hericourt, Jerome, & Poncet, Sandra. 2012. Exchange Rate Volatility, Financial Constraints and Trade: Empirical Evidence from Chinese Firms. *CEPII*.

Ito, T., Koibuchi, S., Sato, K., & Shimizu, J. 2010. *Determinants of Currency Invoicing in Japanese Exports: A Firm Level Analysis*.

Kuzmina, Olga, Sokolova, Maria, & Volchkova, Natalya. *Passing on the Pass Through*.

Manova, Kalina, & Zhang, Z. 2012. Export prices across firms and destinations. *Quarterly Journal Of Economics*, 379–436.

Martin, J., & Mejean, I. 2012. Invoicing currency, Firm size and Hedging. *CEPII*.

Melitz, M., & Ottaviano, G.I.P. 2008. Market Size, Trade and Productivity. *Review of Economic Studies*, **75**, 295–316.

Novy, Dennis. 2006. *Hedge Your Costs: Exchange Rate Risk and Endogenous Currency Invoicing*. Tech. rept.

Page, S.A. B. 1977. Currency Invoicing in Merchandise Trade. August.

Page, S.A.B. 1981. The Choice of Currency in Merchandise Trade. *National Institute Economic Review*, **98**(November).

Rauch, J.E. 1999. Networks versus markets in international trade. *Journal of International Economics*, **48**, 7–35.

Rey, Helene. 2001. International Trade and Currency Exchange. *Review of Economic Studies*, **68:2**(April), 443–464.

Samiee, Saeed, & Anckar, Patrik. 1998. Currency Choice in Industrial Pricing: A Cross-National Evaluation. *Journal of Marketing*, **62**(3).

Vidgor, Jacob L. 2002. Interpreting Ethnic Fragmentation Effects. *Economic Letters*, **75**, 271–276.

Wilander, Fredrik. 2005. An Empirical Analysis of the Currency Denomination in International Trade.

Table 1: Russian Exporters by Destination region and broad industry group, by value

Percent Share In Transaction Value								
	CIS	China	East and SE Asia	EU	USA	Middle East	RoW	Industry Percent of the Total
Agriculture	3.68%	0.04%	0.73%	0.47%	0.29%	8.23%	1.20%	1.57%
Basic metals and minerals	72.67%	63.15%	86.76%	92.03%	49.14%	81.41%	88.73%	85.13%
Chemicals	4.98%	13.37%	4.17%	2.34%	6.96%	3.37%	4.96%	4.30%
Leather and leather goods	0.03%	0.03%	0.01%	0.10%	0.07%	0.01%	0.04%	0.06%
Machinery	6.69%	3.84%	1.01%	0.37%	0.87%	0.90%	1.45%	1.72%
Plastic	2.60%	2.40%	0.51%	0.39%	0.37%	0.57%	0.47%	0.52%
Textile	0.44%	0.07%	0.05%	0.07%	0.09%	0.15%	0.06%	0.79%
Transport	4.45%	0.63%	1.13%	0.13%	0.60%	0.80%	1.08%	0.11%
Wood	3.36%	15.73%	5.26%	3.76%	40.85%	4.20%	1.50%	1.09%
Other	1.11%	0.73%	0.37%	0.33%	0.77%	0.35%	0.52%	4.72%
	12.12%	4.74%	4.68%	37.36%	2.85%	6.38%	31.87%	

Table 2: Russian Exporters by Destination region and broad industry group, by count

Percent Share In Transaction Count								
	CIS	China	East and SE Asia	EU	USA	Middle East	RoW	Industry Percent of the Total
Agriculture	11.80%	0.27%	6.30%	3.74%	13.79%	4.50%	7.15%	7.88%
Basic metals and minerals	19.84%	6.73%	26.21%	29.82%	33.48%	39.70%	33.48%	23.84%
Chemicals	19.84%	6.73%	26.21%	29.82%	33.48%	39.70%	33.48%	23.48%
Leather and leather goods	0.22%	0.04%	0.19%	0.88%	0.16%	0.09%	0.28%	0.31%
Machinery	15.97%	1.46%	8.70%	6.72%	7.10%	5.62%	12.33%	11.30%
Plastic	9.69%	1.44%	4.03%	3.38%	2.68%	3.84%	6.75%	6.62%
Textile	2.78%	0.14%	1.19%	1.34%	2.00%	1.26%	2.21%	2.01%
Transport	9.45%	0.20%	3.64%	0.94%	2.03%	3.97%	4.76%	5.60%
Wood	11.11%	86.09%	35.95%	41.77%	20.71%	32.05%	18.64%	27.83%
Other	6.06%	0.66%	3.27%	4.62%	8.25%	2.01%	4.59%	4.71%
	44.62%	11.26%	3.50%	15.90%	1.90%	4.71%	18.10%	

Table 3: Transaction Size and Firm Pricing Distributions

Distribution of the firm sizes and pricing type		0-25%	25-50%	50-75%	75-90%	90-95%	95-99%
Mean transaction value	LCP	117773.9	106644.3	148789.8	201547.2	210496.2	311179.8
	PCP	33849.5	28646.74	26397.3	29620.3	35342.0	31004.5
	VCP	203208.4	155739.6	188421.1	174836.5	177972.1	181970.6
Mean transaction count	LCP	2.68	8.57	25.3	73.63	195.66	311.66
	PCP	1.87	7.32	21.98	56.22	164.33	385
	VCP	2.97	10.51	37.86	113.19	244.93	607.95
Average share for an average firm	LCP	36%	32%	30%	30%	32%	24%
	PCP	25%	28%	26%	23%	27%	30%
	VCP	39%	40%	44%	47%	40%	47%

Cumulative distribution of the firm sizes and pricing type		25%	50%	75%	90%	95%	99%
Mean transaction value	LCP	117773.9	111089.9	124233.6	144811.2	151171.3	165055.5
	PCP	33849.5	31129.4	29796.8	29763.0	30137.5	30185.9
	VCP	203208.4	175888.2	179930.7	178803.0	178740.5	178939.2
Mean transaction count	LCP	2.68	6.21	12.87	29.04	45.18	68.3
	PCP	1.87	4.71	9.57	18.51	28.29	48.21
	VCP	2.97	7.31	17.17	38.42	53.95	88.04

Table 4: areg for characteristics (R-squared reported)

	(1) lcp	(2) pcp	(3) vcp
Destination	0.646	0.487	0.448
Firm	0.546	0.695	0.589
HS6 Product	0.183	0.375	0.256
Observations	7,277,340	7,277,340	7,277,340

Table 5: Testing the aggregate model of currency choice determinants

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Walrascon	1.34***	2.48***	1.17***	2.21***	2.00***	3.24***
	(0.11)	(0.19)	(0.12)	(0.23)	(0.16)	(0.19)
Refcon	0.32***	2.09***	0.12	1.93***	1.15***	2.83***
	(0.11)	(0.18)	(0.12)	(0.21)	(0.16)	(0.25)
Cust_barg_ag	-0.69***	-1.62***	-0.77***	-1.15***	-0.04	-3.22***
	(0.13)	(0.25)	(0.14)	(0.24)	(0.22)	(0.54)
Importshare	0.27**	0.77***	0.23	0.58***	0.25*	0.66**
	(0.12)	(0.20)	(0.15)	(0.20)	(0.14)	(0.26)
USDhedge	0.20***	0.20**	0.21***	0.25***	0.17**	0.09
	(0.0645)	(0.10)	(0.07)	(0.09)	(0.08)	(0.17)
EURhedge	0.18**	0.15**	0.16*	0.12*	0.36***	0.36***
	(0.08)	(0.07)	(0.09)	(0.06)	(0.11)	(0.14)
Euroarea	-0.18**	3.93***	-0.30***	3.72***	0.36***	4.69***
	(0.09)	(0.14)	(0.08)	(0.15)	(0.13)	(0.19)
Coefvar	-2.70***	-0.76**	-2.90***	-0.88**	-2.34***	-0.37
	(0.26)	(0.31)	(0.27)	(0.41)	(0.46)	(0.42)
Constant	-1.47***	-6.61***	-1.40***	-6.41***	-1.66***	-7.03***
	(0.13)	(0.29)	(0.14)	(0.33)	(0.22)	(0.31)
Observations	8,614,721	8,614,721	6,467,539	6,467,539	2,147,182	2,147,182
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Clusters	20992	20992	19618	19618	16786	16786

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Firm level test of the currency choice determinants

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.45***	-0.30***	0.36***	-0.40***	0.61***	-0.13
	(0.05)	(0.08)	(0.05)	(0.13)	(0.07)	(0.13)
FirmBarg	-0.95***	-1.22***	-1.07***	-1.10***	0.13	-1.26***
	(0.13)	(0.25)	(0.14)	(0.27)	(0.18)	(0.47)
dAboveMed	0.07***	0.09***	0.06***	0.08***	0.12***	0.13***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.02)
Walrascon	0.28*	0.88***	0.10	0.75***	0.86***	1.44***
	(0.16)	(0.17)	(0.18)	(0.24)	(0.17)	(0.26)
Refcon	-0.08	0.90***	-0.26	0.73***	0.59***	1.72***
	(0.16)	(0.17)	(0.17)	(0.23)	(0.18)	(0.23)
Diversification	1.47***	0.44*	1.53***	0.43	1.30***	1.01***
	(0.12)	(0.24)	(0.14)	(0.27)	(0.17)	(0.34)
clear_shareLCP	1.85***	3.99***	1.43***	3.62***	2.81***	4.98***
	(0.16)	(0.20)	(0.18)	(0.21)	(0.22)	(0.27)
clear_sharePCP	3.74***	1.35***	3.69***	1.16***	4.03***	1.75***
	(0.09)	(0.22)	(0.09)	(0.25)	(0.15)	(0.30)
USDhedge	0.06	0.19**	0.05	0.22***	0.14*	0.12
	(0.04)	(0.08)	(0.05)	(0.08)	(0.08)	(0.15)
EURhedge	0.19***	0.17***	0.19***	0.10	0.30***	0.39***
	(0.05)	(0.06)	(0.06)	(0.06)	(0.09)	(0.12)
Dollarpeg	1.97***	4.84***	2.19***	4.93***	1.71***	6.00***
	(0.23)	(0.26)	(0.26)	(0.28)	(0.48)	(0.60)
Euroarea	-0.33***	2.21***	-0.23**	2.28***	-0.37**	2.12***
	(0.09)	(0.16)	(0.09)	(0.19)	(0.15)	(0.23)
Coefvar	-1.04***	-0.11	-1.26***	-0.51	-0.58*	0.65
	(0.20)	(0.33)	(0.19)	(0.48)	(0.33)	(0.53)
Constant	-2.49***	-5.52***	-2.35***	-5.36***	-2.97***	-6.37***
	(0.18)	(0.25)	(0.19)	(0.31)	(0.22)	(0.34)
Observations	7,727,208	7,727,208	5,725,362	5,725,362	2,001,846	2,001,846
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18123	18123	16937	16937	14319	14319
Convergence	1	1	1	1	1	1

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Joint test of the country and firm level currency choice determinants

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.52***	-0.19**	0.44***	-0.27**	0.61***	-0.23*
	(0.05)	(0.09)	(0.05)	(0.13)	(0.08)	(0.13)
FirmBarg	-1.27***	-1.78***	-1.53***	-1.93***	0.13	-1.03**
	(0.16)	(0.29)	(0.15)	(0.32)	(0.22)	(0.50)
Importshare	0.46***	0.73***	0.61***	0.99***	0.01	-0.40*
	(0.10)	(0.20)	(0.09)	(0.18)	(0.13)	(0.23)
dAboveMed	0.07***	0.09***	0.06***	0.08***	0.12***	0.13***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Walrascon	0.32**	0.98***	0.17	0.92***	0.86***	1.44***
	(0.16)	(0.17)	(0.17)	(0.24)	(0.17)	(0.26)
Refcon	-0.09	0.85***	-0.26	0.70***	0.59***	1.84***
	(0.16)	(0.16)	(0.16)	(0.23)	(0.19)	(0.24)
Diversification	1.45***	0.59***	1.52***	0.61**	1.30***	0.93***
	(0.13)	(0.23)	(0.14)	(0.27)	(0.18)	(0.34)
USDhedge	0.07	0.21***	0.05	0.25***	0.14*	0.12
	(0.05)	(0.08)	(0.05)	(0.08)	(0.08)	(0.15)
EURhedge	0.22***	0.16**	0.21***	0.07	0.30***	0.39***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.09)	(0.12)
Dollarpeg	1.95***	4.89***	2.18***	5.00***	1.73***	5.98***
	(0.23)	(0.25)	(0.26)	(0.27)	(0.48)	(0.60)
Euroarea	-0.31***	2.26***	-0.22**	2.31***	-0.37**	2.10***
	(0.09)	(0.17)	(0.09)	(0.19)	(0.15)	(0.23)
Coefvar	-0.98***	-0.17	-1.16***	-0.52	-0.58*	0.69
	(0.18)	(0.32)	(0.18)	(0.49)	(0.33)	(0.55)
Constant	-2.63***	-5.72***	-2.54***	-5.63***	-2.97***	-6.32***
	(0.17)	(0.26)	(0.17)	(0.33)	(0.23)	(0.35)
Observations	7,727,208	7,727,208	5,725,362	5,725,362	2,001,846	2,001,846
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18123	18123	16937	16937	14319	14319
Convergence	1	1	1	1	1	1

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8a: AIC scores for samples/specifications

	Full Sample	Big Exporters	Small Exporters
Model	AIC score	AIC score	AIC score
Aggregate	7551078.906	5768246.551	1668033.506
Firm-level	5980215.823	4520966.727	1371605.126
Joint	5979317.202	4519814.328	1371580.490
Alternative CustBarg	5995785.670	4521453.023	1372067.876
No basic metals and minerals	4826729.746	3984766.880	1289769.991
No crisis	4397281.783	3897662.890	1200763.783
Top 40 by count or value	4786382.964	3047639.444	1145811.237
No CIS countries			

Table 8b: BIC scores for samples/specifications

	Full Sample	Big Exporters	Small Exporters
Model	BIC score	BIC score	BIC score
Aggregate	7553866.56	5770976.63	1670539.49
Firm-level	5983058.957	4523733.482	1374156.826
Joint	5982174.004	4522621.181	1374156.845
Alternative CustBarg	5997847.780	4598733.448	1408231.844
No basic metals and minerals	4978377.342	4028173.871	1301054.113
No crisis	4402893.976	4000837.120	1176722.999
Top 40 by count or value	4882291.821	4020781.021	11987293.090
No CIS countries	4094497.351	2920491.294	1109473.236

Note: AIC and BIC scores are not comparable across different sample sizes. The solid lines separate samples of the same size.

Figures 1 to 3: Marginal Effect of the FirmBarg

Table 9: Summary table of the results of robustness checks (main coefficients of interest reported only)

	Full sample		No crisis (No 2008-2009)		No basic metals and minerals		40 top destinations by count or value		Mprobit for random 10% sample		No CIS countries	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP	PCP	LCP	PCP	LCP	PCP	LCP
FirmBarg	-0.95***	-1.22***	-1.01***	-1.15***	-0.94***	-1.05***	-0.31***	-1.07***				
	(0.13)	(0.25)	(0.16)	(0.25)	(0.18)	(0.28)	(0.07)	(0.16)				
Importshare	0.46***	0.73***	1.01***	0.34**	0.12***	3.5***	-0.03	3.61***				
	(0.10)	(0.20)	(0.18)	(0.21)	(0.26)	(1.37)	(0.17)	(1.40)				
MacroControls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
MicroControls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
OtherControls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

8 Appendix I

Data management

For the data cleaning, when the destination country was not reported, the trading partner country (if reported) was used.

If the data when transaction is registered falls upon a weekend day, we assign the actual date of the previous Friday, as even if the official accounting registry date for the firm will be the next Monday, the exchange rate has to be calculated with regards to the day of the transaction registration at Customs, and therefore the last day of the national foreign exchange market's rate should be applied.

Transactions recorded to the destinations that are not recognized as an independent country (South Ossetia and Abkhazia) by the UN are considered being a part of the recognized country.

Hedging variable construction

Along the lines of Goldberg & Tille (2008b) and Goldberg & Tille (2008b), the hedging variable is built in order to catch the exchange rate hedging opportunity. It therefore reflects the covariances between marginal costs and exchange rate $\rho\left(m_{ed}, s_{ed}\right)$ and $\rho\left(m_{ev}, s_{ev}\right)$. We assume that the measure is different for different industries. Producer marginal costs are modelled as $m_{ed}^{ind} = w_e^{ind} + \frac{(1-\alpha)}{\alpha} * c_d$, where w_e^{ind} is the wage index per industry representing the unit marginal cost of the exporter, and c_d is the sensitivity of the marginal costs to the changes of the demand in the destination country. We proxy for the marginal costs by constructing a monthly values for m_{ed}^{ind}.

The w_e values are provided monthly for the aggregated industries by the Rosstat[23]. Following GT we set α at 0.65. c_d is the log of real consumption in the destination countries. The real consumption values are acquired from the IFS database for the quarters. For some of the destinations we had to use the yearly values, therefore the estimation procedure was also adjusted (see below for clarifications). s_{ei} represents the exchange rate movement of currency i in units of the domestic currency (roubles). The increase in s_{ei} will represent the depreciation of the roubles.

The OLS[24] specification that is used to determine the hedging opportunities is:

$$m_{ed,t}^{ind} = \gamma_0 + \gamma_1 s_{eUSD,t} + \gamma_1 * s_{eEUR,t}$$

The regression coefficients γ_1 and γ_2 correspond to estimates of covariences $\rho(m_{ev}, s_{eUSD})$ and $\rho(m_{ev}, s_{eUSD})$ accordingly, for the given period. $0 < \gamma_1 < \gamma_2$ represents the situation when USD provides a statistically significant hedging opportunity. $0 < \gamma_2 < \gamma_1$ corresponds to the analogous situation for the EUR. If none of the coefficients is higher than 0, the hedging dummies take value of 0 for both of the currencies.

Therefore, we are able to construct a per-industry per-destination measure of covariance movements between the marginal costs and exchange rates, which brings us to more precision for the estimation of the hedging motive. We improve the GT measure by breaking it down to industries.

Real consumption data

As for some of the destinations the real consumption was not available for the quarterly periods, we construct the variable for the yearly basis, following a 4-year rolling regression window. These destinations sum up to roughly 13% of total trade flows in the population sample. It is not expected to introduce big bias to the according indicators. Slight downwards bias might be expected as the yearly real consumption represents lower variation than the quarterly one.

Real consumption data

$Coefvar_d$ represents the volatility of the destination currency versus the national currency. The higher is the volatility at the destination, the more likely the exporter to use PCP or VCP. The measure is calculated through the variation coefficient in order to dispose the level effects. It is

[23]The Russian Bureau of Statistical Survey

[24]Robust standard errors, rolling window of 4 quarters as in GT.

constructed as a rolling coefficient for quarters based on the previous four quarters over the daily reported values[25]. As a robustness check we also perform a rolling coefficient over a 2-year window. The higher is the value, the more likely the exporter to price in PCP or VCP.

Bargaining power

When calculating bargaining power of the seller (transaction to all imports at the destination of the product) about 10% of the transactions could not be matched on the HS6 level with the data provided by COMTRADE. The issue arose because of reporting the exports into the "other" category or the lack of precision in the reports to international bureaus. We consider our core dataset being the true data, as these are the reports to Customs. For the transactions that can not be matched to the COMTRADE-HS6 directly, we use an aggregative HS4 statistics. We estimate the bargaining power for these transactions with the following procedure:

As some HS6 categories are not reported to be imported from Russia at the destination with COMTRADE, but appear to be in the data and being exported, we correct the sample on the firm shares we use the following procedure:

- share of Russian imports at the destination:

$$Seller_barg_ag_{dt} = \frac{totsales^{t,d}}{tot_RUSimport_HS4^{t,d}_{comtrade}} * ShareHS6^{t,d}$$

- share of firm sales at the destination:

$$barg_power^{f}_{dt} = \frac{firm_salesHS6^{t,d}}{total_importHS4^{t,d}_{comtrade}} * ShareHS6^{t,d}$$

- share of transaction at the destination:

$$Seller_barg = \frac{transaction\ value}{total_RUSimport_HS4_{comtrade}} * ShareHS6^{t,d}$$

  , where $ShareHS6^{t,d} = \frac{total_importHS6^{t,d}_{comtrade}}{total_importHS4^{t,d}_{comtrade}}$ represent the total share of imports of HS6 product in HS4 category at the destination within the year.

HS4 corresponds to the according group of HS6-products where the "unmatched" transaction is placed. Therefore, the first term in all the equation represents the share of the transaction in the "mismatch" of the HS4 category, and the second - the share of HS6 exports to the destination in all HS4 exports to the destination. Only "unmatched" transactions for which the constraint $0 < bargpower^{tr}_{idt} < 1$ were left in the sample. This correction can generate downwards bias for the measure, but the result should hold.

This allows procedure allows us to correct for the data mismatch through calculating the approximate bargaining power, utilizing the importing pattern of the exporting partner.

Diversification index constraint

As mentioned in the main text, diversification index is constructed in the following manner: $Diversification_{hs4,d,-f} = 1 - HH_{hs4,d,-f}$ and $Diversification_{hs4,d,-f} \in [0; 0.67]$. On the examples we can illustrate how different Diversification indexes are obtained:

Tables 10-1 to 10-4: Different Diversificationification scenarios

Scenario 1: complete diversification		
CC	share	Diversification index 0.67
VCP	0.33	
PCP	0.33	
LCP	0.33	

Scenario 2: Extreme Pricing 1		
CC	share	Diversification index 0.0
VCP	1	
PCP	0	
LCP	0	

[25]The daily reports on the exchange rates are taken from the Central Bank of Russia, therefore they capture the face-off dynamics of the rates for the firms

Scenario 3: Extreme Pricing 2		
CC	share	Diversificationification index 0.0
VCP	0	
PCP	1	
LCP	0	

Scenario 2: Diversificationified pricing		
CC	share	Diversificationification index 0.34
VCP	0.8	
PCP	0.1	
LCP	0.1	

Scenarios 2 and 3 indicate that statistically, the diversification index of 0 will mean that all other competitors price in the *same way*, as this measure does not differentiate between the choices. This implies that it will not show difference if the others are pricing completely in VCP or in LCP or PCP. As the main finding on "coalescing" effect in the literature is concerned with the fact that communion in pricing choices of competitors is observed on the homogeneous goods markets, we are interested in the case of $Diversification_{hs4,d,-f} = 0$ being attributed to the case when $HH_{hs4,d,-f} = 1_v^2$, or in other words, the competitors price only in VCP. If this condition is fulfilled, then the increase in Diversification measure will be associated with the increase of probability of pricing in either PCP or LCP. Then the coefficients will report the increase (or fall) in log-likeliness or odd ratios of pricing in *other then VCP* when your competitors at the destination are doing the diversified portfolio. The graph below indicates the "zero" cases.

As seen from the graph, the majority of the "zeros" indeed contribute to the VCP-domination, but we observe certain LCP- and PCP-"zero" cases. These cases constitute to less then 5% of the product-destination diversification index calculations, constituting to less then 3% of the trade volumes. Looking at close into the cases of "bad" zeros, we find that in 80% of the cases both for LCP-concerned and PCP-concerned cases the firm at interest did the same pricing. This means that the firm for which the diversification index is calculated replicated the decision of it's competitor to price completely in LCP and PCP with 0.8 probability.

Upon further investigation, we find that 66% of the cases the firms in the PCP-concerned cases have exported only once to that destination. This supports the fact that first-time exporting to the destination of where there are no firms of your origin doing PCP is a risky behavior, as it increases the exposure to not only the specific market frictions, but also to the excessive exposure to the exchange rate fluctuations compared to other competitors at the destination.

The alike situation is observed for the LCP. 60% of the firms in the LCP-concerned "zero"-cases have exported only once to that destinations.

We omit the cases of "bad" zeros from the sample, so that the diversification index has the meaning of "diversifying from PCP" when it goes from 0. The reported results therefore explain how likely I am to apply LCP compared to VCP or PCP compared to VCP when my home competitors at the destination start using not only VCP at the destination.

Manski reflection problem

In our framework Manski reflection problem that we do not really know if an exporter does k choice because everybody else is doing k choice, or everybody else is doing k choice because they observe the given exporter doing k choice. This has been a big debate in the literature that is concerned with agent-behavior. We cannot assume the independent decision-making as this is the core of the *coalescing* determinant, and therefore we do not claim any causal directions with this measure, as we are simply aiming to exploit the existent data. We acknowledge the fact, that due to the unavailability of such data, we do not observe currency pricing of competitors from other countries.

The diversification index

Variables $clear_shareLCP$ and $clear_sharePCP$ are included in the regressions so that to allow for unbiased estimation of the effect of the concentration on the currency choices. Vidgor (2002) has explained the reasoning why for fragmentation indices in ethnic studies the $(N-1)$ share, where N is the total number of ethnic groups that are represented in the population, should be included in the regression that includes the fragmentation index over N groups. The reasoning

concerns with the zero-share contributions to the explanatory variables when we look at the shares of the populations effecting the dependent variable. If the individuals are summed up to a share in the population, the zero-share contribution of each should also be summed up, therefore when using the fragmentation indices we need to add the shares of the groups into the regression to include the group-specific zero-contributions into the fragmentation index. In our case, as we do not (and cannot) estimate group-contribution in concentration index, by putting the variables $clear_shareLCP$ and $clear_sharePCP$ into the regression, we get more precise estimation of the role of diversified pricing, while allowing in estimation different types of currency pricing have different intercepts in the specification.

Types of value calculation

The export by the Russian Federation are reported to the Customs Office as FOB (free on board), when the imports reported to COMTRADE are CIF (cost, insurance and freight). Therefore, different accounting is used for the same flow.

In order to solve this problem, we use COMTRADE-based database BACI, which corrects for the transport costs in reported imports and reports FOB imports. We skip the description of the construction of the BACI dataset, as it can be found in great detail in other sources, such as, for example, Gaulier & Zignano (2010). It should be noted that BACI has been missing about 1,3 million transactions at the imported destination - as the destinations did not report to be importing at HS6 level products from Russian Federation. With the procedure reported above we were able to correct for the majority of the mismatch (about 90%) and for the rest of them we used the raw COMTRADE reported imports. Even though it might be a source of a downward bias, we do not consider it being any sort of significant distortion to our findings.

Coefficient of variation of the exchange rates

If the CBR does not trade the currency and does not report the exchange rate for the country's currency, we set the coefficient of variation equal to 1. This is plausible as the fact that the exporters cannot freely exchange the currency emphasizes the fact that they cannot forecast or determine their profits and therefore will use the PCP or VCP.

For the case of Serbia and Montenegro that got separated in 2006 in two separate countries, we use volatility of the Serbian dinar as it is believed to most fully depict the fluctuations of the exchange rate. As the level and the real value of the exchange rate does not matter for the calculations, this should not generate any bias.

Econometric notice

We perform the general tests for MNLM. The tests reported are on the full-sample modified test. Upon request other tests can be reported. After providing the results of the test, we discuss the eligibility of usage of MNLM for specification.

Full multinomial logit specification with variables therefore is:

The aggregated test is specified as:

$$\begin{aligned} log\left(\frac{p_{ij}}{p_{i0}}\right) = \beta_{0j} + \beta_{1j} * EURhedge_{i,d} + \beta_{2j} * USDhedge_{i,d} + \beta_{3j} * Coefvar_d + \\ + \beta_{4j} * Euroarea_d + \beta_{5j} * Dollarpeg_d + \beta_{6j} * Walrascon_i + \beta_{7j} * Refcon_i + \\ + \beta_{8j} * Cust_barg_ag^{tr}_{i,d,t} + \beta_{9j} * Importshare^i_d + \delta_t + \lambda_d \end{aligned} \quad (1)$$

The firm-level test has a form of:

$$\begin{aligned} log\left(\frac{p_{ij}}{p_{i0}}\right) = \beta_{0j} + \beta_{1j} * EURhedge_{i,d} + \beta_{2j} * USDhedge_{i,d} + \beta_{3j} * Coefvar_d + \\ + \beta_{4j} * Euroarea_d + \beta_{5j} * Dollarpeg_d + \beta_{6j} * Walrascon_i + \beta_{7j} * Refcon_i + \beta_{6j} * Diversification_{i,-f,d} + \\ + \beta_{6j} * Cust_barg^{tr}_{i,d,f} + \beta_{7j} * Sellerbarg_{i,f,tr} + \beta_{8j} * dAboveMed_{i,f,d,t} + \delta_t + \lambda_d \end{aligned} \quad (2)$$

Time subscript is neglected for brevity. All regressions are run with the industry and year clustered robust standard errors on time (year) and industry (HS6 level). We decide to change the clustering from as was used by GTb, as clustering on the HS6 is a valid assumption, as the multiple transactions of a product (or a variety of closely similar products - as real trade is done on HS10 level) could be correlated within each year. Changing clusters to HS4-year does not change the results, so we prefer to stay at the more disaggregated level of HS6. Time dimension of clusters is taken at the year level, with time fixed effects entering the regression on the yearly level too. The level of aggregation provides us with sufficient number of clusters, which increase the estimation precision. Reduction of time-aggregation of clusters to a month does not provide sufficient changes to the results, but incommensurably increases the process of estimation.

Wald test for independent variables

We compute Wald tests for all specifications, as even though the LR test is believed to be superior in power, on the big dataset and more complex models, the computational costs of the test become far too great.

The Wald tests is performed in the following way: Let $\hat{beta}_k$ be the vector of J-1 coefficients associated with the certain (or set of certain) independent variable(s). Then $\hat{Var}(\hat{\beta}_k)$ is the estimated covariance matrix. If the null hypothesis of all the coefficients associated with the certain independent variable is true, the Wald statistic $W_k = \hat{\beta}_k' \hat{Var}(\hat{\beta}_k)^{-1} \hat{\beta}_k$ will chi-square distributed statistic with J-1 degrees of freedom.

Table 11-1: Wald independent variables test results
Ho: All coefficients associated with given variable(s) are 0

Variable	Chi2	df	P>chi2
cust_barg1	101.696	2	0.000
seller_barg	73.373	2	0.000
Walrascon	30.175	2	0.000
Refcon	29.972	2	0.000
Diversification	147.126	2	0.000
usd_hedge	405.246	2	0.091
eur_hedge	1760.696	2	0.000
Dollarpeg	398.376	2	0.000
Euroarea	187.685	2	0.000
Coefvar2	29.394	2	0.000

From the results of the test we can reject the hypothesis that the variables do not effect the choices of currency pricing (For all variables except for usd_hedge at 99% level).

The Wald tests for combining the alternatives (N=7757542)

Table 11-2: Wald alternatives combinations test result
Ho: All coefficients except intercepts associated with a given pair of alternatives are 0 (i.e., alternatives can be combined)

Alternatives tested	Chi2	df	P>chi2
0-1	99068.884	23	0.000
0-2	13961.060	23	0.000
1-2	41881.089	23	0.000

The results of the test show that none of the dependent categories can be combined.

Small-Hsiao tests of IIA assumption (N=7757542)

Small-Hsiao test divides the sample into two subsamples and estimates weighted average of the coefficients of the unrestricted multinomial logit in the following manner:

$$\hat{\beta}_u^{S_1,S_2} = \left(\frac{1}{\sqrt{2}}\hat{\beta}_u^{S_1}\right) + \left[1 - \frac{1}{\sqrt{2}}\right]\hat{\beta}_u^{S_2}$$

The restricted sample is constructed from the second subsample by elimating all cases of one of the alternatives. The Small-Hsiao statistic is constructed as

$$SH = -2\left[L\left(\hat{\beta}_u^{S_1,S_2}\right) - L\left(\hat{\beta}_r^{S_2}\right)\right]$$

The SH statistic is chi-square distributed with k+1 degrees of freedom (k being the number of independent variables).

Table 11-3: Small-Hsiao test results

Ho: All coefficients except intercepts associated with a given pair of alternatives are 0 (i.e., alternatives can be combined)

Omitted	lnL(full)	lnL(omit)	Chi2	df	P>chi2	evidence
0	-329000	-328000	2354.675	24	0.000	against Ho
0	-1240000	-1240000	315.482	24	0.000	against Ho

The Small-Hsiao test indicate that IIA assumption is violated. It should be noted that Hausman test cannot be performed here due to robust SE and clustering.

General relevance of the MNLM

As it is seen from the tests above, even if the The IIA assumption is not satisfied - which is a common critique against using the MNLM, as IIA implies that MNLM should be used when the outcome categories "can be plausibly assumed to be distinct and weighted independently in the eyes of each decision maker"Hausman & McFadden (1984) or the alternatives should be "dissimilar" Amemiya (1981).

Conventionally, it indicates that we need to estimate the MNPM (multinomial probit model). As the according estimation does not converge, we admit that we cannot technically do better then MNLM, but we also draw attention to the spread critique of the eligibility of IIA tests among statisticians. It should be noted first that both the Hausman test and Small-Hsiao test are based on the restricted choice[26] tests.

The first and the main strand of critique we cite is connected to the simulation studies performed by (Fry & Harris, 1998) (Fry & Harris, 1996) and Cheng & Long (2006) that indicate that even on the very large datasets the simulated probability of rejecting Ho was quite different then the nominal level. They also note that the performance of the tests varies significantly between different data structures. (Cheng & Long, 2006) state "tests of IIA assumption that are based on the estimation of a restricted choice set are unsatisfactory for applied work".

Another strand of argument is concerned with the comparison between the multinomial logit model and binary logits in the Small-Hsiao test. As Small-Hsiao test splits the sample randomly, two issues arise: the number and size of clusters in each sub-sample and the multitude of different random splits. To be more precise, there could exist a number of SH statistic that will actually show that IIA is satisfied.

All in all, we can conclude, that even though we admit potential absence of robustness in the econometric specification, we can not yet perform better then multinomial logit model. Therefore, the achieved results are just as good as they can be, and should be considered for further inference and discussions in the area, before a better estimation technics become more feasible.

[26]implies that to test IIA for each alternative it deletes observations with that alternative and re-estimates the the model considering only the alternatives that are left, and then compares the test statistic of the original and new models

9 Appendix 2

Table 12: Robustness check 1: No basic metals and minerals

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.42***	-0.28***	0.33***	-0.34**	0.52***	-0.31*
	(0.05)	(0.09)	(0.06)	(0.14)	(0.07)	(0.16)
FirmBarg	-1.01***	-1.15***	-1.13***	-1.02***	-0.12	-1.39***
	(0.16)	(0.25)	(0.18)	(0.28)	(0.09)	(0.51)
Importshare	0.12*	3.5**	0.07	4.08***	0.80**	-1.89
	(0.07)	(1.37)	(0.26)	(1.37)	(0.42)	(1.41)
dAboveMed	0.06***	0.10***	0.05***	0.10***	0.16***	0.10***
	(0.00476)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)
Walrascon	0.30***	0.36	0.24**	0.33	0.44***	0.42
	(0.10)	(0.29)	(0.11)	(0.35)	(0.14)	(0.37)
Refcon	0.06	0.63**	0.00	0.59*	0.21	0.73**
	(0.09)	(0.30)	(0.10)	(0.35)	(0.16)	(0.35)
Diversification	1.43***	0.29	1.45***	0.22	1.26***	-0.72***
	(0.14)	(0.29)	(0.17)	(0.31)	(0.15)	(0.30)
USDhedge	0.21***	0.36***	0.19***	0.37**	0.31***	3.27***
	(0.06)	(0.13)	(0.07)	(0.15)	(0.07)	(0.25)
EURhedge	0.23***	0.22***	0.23***	0.12	0.33***	-0.75***
	(0.07)	(0.07)	(0.07)	(0.08)	(0.10)	(0.20)
Euroarea	0.04	2.18***	0.06	2.14***	0.13	2.46***
	(0.09)	(0.19)	(0.10)	(0.22)	(0.14)	(0.26)
Dollarpeg	1.97***	4.90***	2.28***	5.00***	1.71***	5.93***
	(0.24)	(0.27)	(0.31)	(0.28)	(0.47)	(0.64)
Coefvar	-0.94***	-0.13	-1.22***	-0.76	-0.46	0.67
	(0.23)	(0.40)	(0.23)	(0.65)	(0.33)	(0.57)
Constant	-2.53***	-5.17***	-2.47***	-5.14***	-2.65***	-5.21***
	(0.11)	(0.38)	(0.12)	(0.45)	(0.16)	(0.43)
Observations	5,994,221	5,994,221	4,222,788	4,222,788	1,771,433	1,771,433
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Clusters	14509	14509	13433	13433	11482	11482

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13: Robustness check 2: No 2008-2009 (no Financial Crisis)

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.37***	-0.55***	0.29***	-0.76***	0.50***	-0.14
	(0.05)	(0.10)	(0.06)	(0.18)	(0.09)	(0.15)
FirmBarg	-0.94***	-1.05***	-1.04***	-0.92***	-0.02	-1.45*
	(0.18)	(0.28)	(0.20)	(0.29)	(0.24)	(0.76)
Importshare	1.01***	0.34**	0.91*	0.09**	0.37***	0.53***
	(0.18)	(0.19)	(0.54)	(0.05)	(0.24)	(0.26)
dAboveMed	0.07***	0.09***	0.06***	0.09***	0.13***	0.12***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.03)
Walrascon	0.47***	1.01***	0.26*	0.84**	1.09***	1.63***
	(0.11)	(0.23)	(0.14)	(0.33)	(0.19)	(0.38)
Refcon	0.10	1.04***	-0.13	0.76**	0.87***	2.01***
	(0.11)	(0.23)	(0.13)	(0.32)	(0.21)	(0.34)
Diversification	1.90***	0.46	2.00***	0.44	1.66***	1.10***
	(0.16)	(0.31)	(0.19)	(0.35)	(0.24)	(0.41)
USDhedge	-0.06	0.16*	-0.08	0.21**	0.05	0.06
	(0.05)	(0.09)	(0.05)	(0.08)	(0.10)	(0.16)
EURhedge	0.15**	0.09	0.16**	0.08	0.22*	0.20
	(0.06)	(0.06)	(0.07)	(0.06)	(0.11)	(0.16)
Dollarpeg	1.86***	5.20***	1.98***	5.31***	2.66***	6.3***
	(0.28)	(0.34)	(0.33)	(0.38)	(0.53)	(0.65)
Euroarea	-0.15	2.25***	-0.05	2.32***	-0.09	2.22***
	(0.12)	(0.21)	(0.13)	(0.22)	(0.17)	(0.32)
Coefvar	-0.09	0.60	-0.04	0.51	-0.07	1.00*
	(0.14)	(0.37)	(0.18)	(0.55)	(0.23)	(0.60)
Constant	-2.76***	-5.79***	-2.59***	-5.64***	-3.27***	-6.49***
	(0.12)	(0.30)	(0.14)	(0.40)	(0.23)	(0.48)
Observations	4,429,687	4,429,687	3,228,115	3,228,115	1,201,572	1,201,572
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Clusters	11042	11042	10305	10305	8691	8691

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14: Robustness check 3: country-destination fixed effects for the top 40 most common destinations

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.42***	-0.35***	0.34***	-0.55***	0.34***	-0.55***
	(0.07)	(0.12)	(0.09)	(0.14)	(0.09)	(0.14)
Importshare	-0.33	2.44***	-4.39	3.27***	2.38	0.76**
	(0.49)	(0.71)	(2.98)	(0.97)	(1.32)	(0.43)
FirmBarg	-1.18***	-1.27***	-0.48***	-1.17***	-0.48***	-1.17***
	(0.15)	(0.31)	(0.14)	(0.36)	(0.14)	(0.36)
dAboveMed	0.07***	0.09***	0.12***	0.16***	0.12***	0.16***
	(0.00679)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)
Walrascon	0.39***	1.20***	1.11***	1.84***	1.11***	1.84***
	(0.07)	(0.17)	(0.11)	(0.17)	(0.11)	(0.17)
Refcon	0.10	1.05***	0.71***	1.82***	0.71***	1.81***
	(0.09)	(0.18)	(0.14)	(0.21)	(0.14)	(0.21)
divers	0.54***	-0.05	0.72***	-0.15	0.72***	-0.15
	(0.20)	(0.23)	(0.18)	(0.28)	(0.18)	(0.28)
clear_shareLCP	1.88***	3.38***	2.39***	4.11***	2.39***	4.11***
	(0.15)	(0.23)	(0.20)	(0.39)	(0.20)	(0.39)
clear_sharePCP	2.64***	1.39***	2.67***	2.13***	2.67***	2.13***
	(0.07)	(0.18)	(0.08)	(0.29)	(0.08)	(0.29)
USDhedge	-0.00	0.19**	-0.05	-0.02	-0.05	-0.02
	(0.07)	(0.07)	(0.08)	(0.12)	(0.08)	(0.11)
EURhedge	0.14**	-0.02	0.15**	0.07	0.15**	0.07
	(0.05)	(0.05)	(0.06)	(0.08)	(0.06)	(0.08)
Euroarea	1.67***	0.41***	0.30	-0.06	0.30	-0.06
	(0.25)	(0.11)	(0.26)	(0.20)	(0.26)	(0.20)
Coefvar	-0.01	0.14	-0.15	0.32	-0.15	0.32
	(0.19)	(0.34)	(0.11)	(0.48)	(0.11)	(0.48)
Constant	-1.93***	-11.53***	-2.29***	-11.17***	-2.29***	-11.17***
	(0.17)	(0.85)	(0.16)	(0.94)	(0.16)	(0.94)
Observations	5,848,360	5,848,360	4,517,833	4,517,833	1,330,527	1,330,527
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Clusters	15632	15632	13974	13974	12462	12462

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Note: Dollarpeg is dropped as no destination in top 40 is pegged to USD

Table 15: Robustness check 4: Joint test for only top-40 destinations by count or value

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
CustBarg_alt	0.59***	0.23***	0.61***	0.14	0.17***	-0.14
	(0.04)	(0.09)	(0.05)	(0.10)	(0.05)	(0.1)
FirmBarg	-0.31***	-1.07***	-0.33***	-1.12***	-0.12	-0.17
	(0.07)	(0.16)	(0.08)	(0.14)	(0.09)	(0.17)
Importshare	-0.03	3.61***	0.04	4.36***	0.04	-1.95
	(0.17)	(1.40)	(0.17)	(1.38)	(0.42)	(1.44)
dAboveMed	0.12***	0.01	0.10***	-0.02	0.16***	0.062
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.04)
Walrascon	0.32***	0.79**	0.52***	1.20***	0.14	-0.70**
	(0.10)	(0.31)	(0.12)	(0.37)	(0.16)	(0.32)
Refcon	0.28**	1.17***	0.53***	1.40***	0.07	0.15
	(0.12)	(0.32)	(0.14)	(0.39)	(0.172)	(0.32)
Diversification	-0.24	-0.44***	0.13	-0.55**	0.75***	-0.70**
	(0.17)	(0.23)	(0.27)	(0.27)	(0.25)	(0.30)
clear_shareLCP	2.00***	2.50***	1.81***	2.21***	2.83***	3.26***
	(0.16)	(0.16)	(0.159)	(0.16)	(0.23)	(0.25)
clear_sharePCP	3.04***	1.37***	2.89***	1.51***	3.68***	1.81***
	(0.11)	(0.18)	(0.12)	(0.21)	(0.14)	(0.27)
USDhedge	-0.07	0.30*	-0.24***	0.179	0.41***	0.51***
	(0.09)	(0.18)	(0.08)	(0.20)	(0.150)	(0.189)
EURhedge	0.418***	-0.46***	0.50***	-0.37**	0.17	-0.78***
	(0.07)	(0.17)	(0.071)	(0.16)	(0.14)	(0.21)
Euroarea	1.07***	0.38*	1.06***	0.42**	1.39***	0.74**
	(0.18)	(0.20)	(0.15)	(0.19)	(0.27)	(0.32)
Coefvar	-2.68***	-3.86***	-3.43***	-3.69***	-1.19	-4.95***
	(1.01)	(0.72)	(0.65)	(0.91)	(1.88)	(1.030)
Constant	-2.30***	-0.27	-2.65***	1.57**	-2.76***	0.02
	(0.48)	(0.83)	(0.47)	(0.62)	(0.67)	(1.127)
Observations	6,383,647	6,383,647	4,715,485	4,715,485	1,668,162	1,668,162
Time FE	YES	YES	YES	YES	YES	YES
RegionIncome FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Clusters	14180	14180	13287	13287	11299	11299

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 16: Robustness check 5: No CIS countries

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
CustBarg	0.422***	0.0745***	0.442	0.0336	-0.0483**	-0.330***
	(0.0101)	(0.0162)	(0)	(0)	(0.0198)	(0.0301)
Firmbarg	-0.199***	-0.415***	-0.225	-0.427	0.00226	0.0216
	(0.00547)	(0.00690)	(0)	(0)	(0.0181)	(0.0285)
Importshare	-0.289***	-0.0831	0.0293	0.715	-2.324***	-3.958***
	(0.0960)	(0.141)	(0)	(0)	(0.625)	(0.653)
dAboveMed	0.259***	0.0635***	0.278	0.0442	0.214***	0.0978***
	(0.00318)	(0.00453)	(0)	(0)	(0.00588)	(0.00967)
Walrascon	0.406***	0.661***	0.253	0.592	0.656***	-0.0252
	(0.00978)	(0.0139)	(0)	(0)	(0.0253)	(0.0317)
Refcon	0.126***	0.752***	-0.0644	0.293	0.558***	0.802***
	(0.00914)	(0.0126)	(0)	(0)	(0.0243)	(0.0294)
Diversification	0.838***	-0.254***	0.703	-0.208	1.242***	-0.0223
	(0.0125)	(0.0147)	(0)	(0)	(0.0283)	(0.0375)
clear_shareLCP	1.850***	2.418***	1.594	2.167	2.811***	3.397***
	(0.00974)	(0.00901)	(0)	(0)	(0.0236)	(0.0261)
clear_sharePCP	2.758***	1.157***	2.731	1.382	2.987***	1.011***
	(0.00956)	(0.0160)	(0)	(0)	(0.0225)	(0.0365)
USDhedge	-0.00645	0.228***	-0.238	0.170	0.553***	0.388***
	(0.00743)	(0.0109)	(0)	(0)	(0.0142)	(0.0241)
EURhedge	0.306***	-0.328***	0.352	-0.230	0.165***	-0.699***
	(0.00521)	(0.00680)	(0)	(0)	(0.0112)	(0.0151)
Euroarea	0.626***	0.476***	0.638	0.462	0.780***	0.638***
	(0.0204)	(0.0166)	(0)	(0)	(0.0536)	(0.0445)
Coefvar	-5.519***	2.666***	-4.203	3.428	-9.224***	-0.0864
	(0.192)	(0.228)	(0)	(0)	(0.290)	(0.563)
Constant	-4.385***	-1.399***	-20.35	-0.0455	-5.712***	-2.234***
	(0.392)	(0.373)	(0)	(0)	(0.458)	(0.559)
Observations	4,577,221	4,577,221	3,234,812	3,234,812	1,342,409	1,342,409
Time FE	YES	YES	YES	YES	YES	YES
RegionIncome FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 17: Robustness check 6: Sample of the mprobit estimation (random sample)

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
CustBarg	0.47***	0.11***	0.49***	0.19***	0.17***	-0.19***
	(0.01)	(0.03)	(0.13)	(0.04)	(0.22)	(0.05)
FirmBarg	-0.10***	-0.25	-0.13***	-0.28***	0.09***[27]	0.05
	(0.00)	(0.01)	(0.00)	(0.01)	(0.02)	(0.05)
Importshare	-0.18**	1.67***	-0.07	1.66***	0.27**	-2.47**
	(0.08)	(0.13)	(0.84)	(0.15)	(0.15)	(0.98)
dAboveMed	0.11***	0.02**	0.12***	0.00	0.15***	0.07***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)
Walrascon	0.03**	0.39***	-0.05***	0.39***	0.39***	0.00
	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)	(0.06)
Refcon	0.07***	0.49***	-0.16***	0.21***	0.33***	0.56***
	(0.01)	(0.02)	(0.01)	(0.03)	(0.3)	(0.05)
Diversification	0.23**	-0.31***	0.16***	-0.23***	0.59***	-0.13**
	(0.10)	(0.03)	(0.1)	(0.03)	(0.03)	(0.06)
clear_shareLCP	1.58***	1.98***	1.36***	1.83***	2.40***	2.63***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)
clear_sharePCP	2.42***	1.17***	2.38***	1.33***	2.71***	0.94***
	(0.00)	(0.03)	(0.01)	(0.03)	(0.02)	(0.06)
USDhedge	0.01	0.17***	-0.06***	0.16***	0.29***	0.24***
	(0.00)	(0.02)	(0.01)	(0.02)	(0.02)	(0.04)
EURhedge	0.25***	-0.22***	0.30***	-0.14***	0.15***	-0.48***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.02)	(0.03)
Euroarea	0.41***	0.26***	0.48***	0.25***	0.50***	0.43***
	(0.04)	(0.03)	(0.04)	(0.04)	(0.10)	(0.08)
Coefvar	-1.95***	-1.23***	-2.16***	-0.98***	-1.70***	1.10**
	(0.11)	(0.19)	(0.13)	(0.23)	(0.23)	(0.44)
Constant	-1.77***	-1.12**	-1.91***	-12.92***	-1.87***	-0.19
	(0.22)	(0.70)	(0.65)	(0.80)	(0.39)	(0.85)
Observations	1,237,163	1,237,163	939,469	939,469	2,001,846	2,001,846
Time FE	YES	YES	YES	YES	YES	YES
RegionIncome FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Dollarpeg is omitted in most of the mprobit estimations. Not clustered standard errors (as mprobit allows for correlation of standard errors)

Table 18: Alternative measure of cust_barg2 (share of transaction in all sales of the firm at the destination)

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
CustBarg	0.75***	-0.08	0.67***	-0.28**	0.80***	0.09
	(0.05)	(0.09)	(0.049)	(0.14)	(0.08)	(0.13)
FirmBarg	-0.93***	-1.19***	-1.06***	-1.07***	0.14	-1.22***
	(0.127)	(0.25)	(0.14)	(0.27)	(0.19)	(0.47)
dAboveMed	0.08***	0.11***	0.07***	0.09***	0.12***	0.15***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Walrascon	0.27*	0.86***	0.09	0.74***	0.85***	1.43***
	(0.16)	(0.17)	(0.18)	(0.24)	(0.17)	(0.26)
Refcon	-0.08	0.91***	-0.27	0.73***	0.58***	1.71***
	(0.16)	(0.17)	(0.17)	(0.23)	(0.19)	(0.23)
divers	1.48***	0.44*	1.54***	0.43	1.30***	1.01***
	(0.12)	(0.24)	(0.14)	(0.27)	(0.17)	(0.34)
USDhedge	0.06	0.20**	0.05	0.22***	0.14*	0.12
	(0.04)	(0.08)	(0.05)	(0.08)	(0.08)	(0.15)
EURhedge	0.19***	0.16***	0.19***	0.10	0.30***	0.39***
	(0.052)	(0.06)	(0.06)	(0.06)	(0.09)	(0.12)
Dollarpeg	1.96***	4.82***	2.17***	4.91***	1.70***	5.99***
	(0.29)	(0.25)	(0.26)	(0.28)	(0.49)	(0.60)
Euroarea	-0.33***	2.21***	-0.24***	2.29***	-0.38**	2.11***
	(0.0870)	(0.16)	(0.09)	(0.19)	(0.15)	(0.23)
Coefvar	-1.03***	-0.12	-1.24***	-0.53	-0.57*	0.66
	(0.196)	(0.34)	(0.19)	(0.48)	(0.33)	(0.53)
Constant	-2.49***	-5.55***	-2.35***	-5.38***	-2.97***	-6.40***
	(0.18)	(0.25)	(0.19)	(0.31)	(0.22)	(0.34)
Observations	7,727,208	7,727,208	5,725,362	5,725,362	2,001,846	2,001,846
Time FE	YES	YES	YES	YES	YES	YES
RegionIncome FE	YES	YES	YES	YES	YES	YES
Clusters	18123	18123	16937	16937	14319	14319

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1