Currency Choice Motivations and Strategic Choices among Exporters

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Abstract

This paper uses highly disaggregated data on the population of Russian Federation exporters between 2005 and 2009 to study the determinants of currency pricing decisions. We test the relevance of the existing theories of currency pricing. First, we look at the different type of determinants resulting from strategic, micro- and macro-components of international trade. We acquire evidence that increase in bilateral trade lessens the reliance on USD and increases the probability of application of the trading partners' currencies. This is a novel fact of link between the bilateral trade expansion and currency choice of the exporters in favor of their or their partner's currency. Then we show that currency choice considerations vary among heterogeneous exporters, with smaller exporters gaining more from trade expansion. We record novel results in support of the bargaining over invoicing, that indicates that increase of the firm trade changes the preferences over the currency pricing. We find "overuse" of the vehicle currency pricing, most commonly USD, in international trade being a result of the change in trading partners' preferences.

Keywords: currency pricing, strategic choice, pass-through, transaction data, export data, vehicle currency, emerging economy
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1 Introduction

The effects of having a product's price set in one currency or another can have a detrimental result on the outcome of a firm's activity. It channels the uncertainties faced by the producer and the customer, determining who and to what extent gets exposed to the exchange rate risk. More precisely, it opens up a channel of non-product specific and indirectly price related factor that can affect the demand of the good, leading to change in preferences over the goods produced in different countries. The expansion of the world trade has positioned the question 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.

There have been multiple studies - both empirical and theoretical - aimed at tracking down the driving forces behind the firms' decisions. There are three possible ways for a producer to state the price of the product: (1) use the currency of the producer's country (producer currency pricing - PCP), (2) apply the currency of the destination country (local currency pricing - LCP) or, based on some considerations, (3) use currency of another country ("vehicle" currency pricing - VCP). If two firms with identical prices and mark-ups choose currency pricing in a different way - for example, PCP and LCP - then the shock to the exchange rate changes mark-ups, and firms ex-post have different prices, even when they were identical ex ante.

On the exporter-side the currency pricing matters as the potential profits of the transaction can be adjusted or even eliminated through exposure to the exchange rate fluctuations of the chosen currency. It also matters as, depending on multitude of factors, 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). Therefore, for the sake of the policy application, the importance of understanding the mechanism of the currency pricing of exporters is incited by the need to understand the realization of the pricing of products originated in different countries at different destination markets.

So which reasons drive exporters to choose one over another type of pricing? Is realization of these motives the same for the heterogeneous exporters? Does trade enhancement, as commonly believed among policy-makers, influence pricing patterns of the exporters? All these questions have remained on the table for the long time and still ought to be studied. We utilize the unique type of dataset on Russian exporters to address these questions.

The research of (Goldberg & Tille, 2008a,b) has provided a first attempt to build-up a framework for a choice of three currencies, therefore capturing the reality of firm's activity the closest. Using the macroeconomic methods they have formed a model that is supposed to capture the motives of the firms. They highlighted the importance of the three main motives of the firms to use one or another currency pricing. We concentrate on the investigation of these three motives to get the best understanding how they are realized in the real exporting activity. We build up a better test for the assessment of these motives, also taking into consideration the existence of the heterogeneous exporters. The first motive captures the competition component of international trade - when the firms are exporting to a destination, they are regarding the product and market characteristics. Therefore, they check the commonly used currency pricing at the destination for the particular product and take into consideration the choices their direct competitors are implementing. We indeed find evidence that currency pricing choice is dependent on the type of the good characteristics and the practice of the competitors. If all exporters (in our case we look at the exporters of the same origin) to the trading partner implement a certain type of currency pricing, the firm has higher probability of doing the same pricing in order to keep the relative position on the market.

Second motive deals with the macroeconomic environment of the exporting activity. Controlling for such fundamentals as volatility of the bilateral exchange rate and belonging to currency unions certain correlations within the cost structure of the product and exchange rates might be observed. If a firm observes that in the same circumstances it could persistently gain higher utility from applying another currency due to the correlation of costs and exchange rate, she would be more likely to use that currency displaying the correlation of the highest positive and significant value. If this strategy is being employed, this provides certain "exchange rate hedging" assurance of having not worse utility when using another currency. Due to the data constraint we cannot capture

this at the firm-level, but we build an industry-level proxy, which does not depict the predicted tendencies, but that could be caused by the approximation. We believe that, having more detailed data, we will indeed observe the case that firms take advantage of the macro-level fundamentals.

The third of the main motives which we rigorously study is the bargaining component of the exporting activity. Every transaction of the firm could be represented as an instant contract between the seller and the buyer, where they bargain over the surplus given their preferences. Different parties indeed have different preferences, but in general it is assumed that the home currency is preferred controlling for other parameters. One of our findings indeed confirms that for the smaller exporters this is indeed the case, but the greater is the exporter, the less relevant choosing his home currency becomes. This becomes one of the main reasons why we observe "love for dollar" - too much reliance on the VCP, which is most likely to be USD. This occurs as a result of the "less preferred" home currencies by the parties - the bigger are the sales, the weaker are the preferences and the more likely the parties to sign onto the "mutually neutral" choice of VCP. Nevertheless, we find stark evidence that the increase of bilateral country trade increases the usage of the currencies of bilateral partners. This fact supports the Bacchetta & van Wincoop (2005) theory that increase of a country presence at the destination overturns optimal pricing in their two-choice model. Notably, even when we control for both - country presence and firm presence at the destination, the bigger transactions exhibit the excessive lenience to dollars albeit the increase of bilateral trade flows.

The goods produced in different countries are compared at the destination market to a certain contemporaneous system of prices expressed usually in the destination (for certain sets of products in the common vehicle currencies) currency. The end-comparison to the destination currency is intuitive, as the goods are usually realized at the final markets in the prices expressed in the local currencies. But depending on the initial currency pricing, the good at the destination market can change its position relative to other comparable goods, de facto affecting the success of the terms of trade. This ambiguity in the position of the good on the market can result in negative profits from the sale, and as the firms are generally seeking stability in the terms of trade (see, for example, MacCoille *et al.* (2009)), they should pursue a certain optimal strategy in currency pricing that will minimize the risk of exchange rate shock negatively affecting their position at the destination markets.

Our paper attempts to bring another strand of argument on the table - the effect of currency pricing in the heterogeneous firms framework. 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 indeed find the support for the presumption that the bigger firms are serving more customers at more destinations and become less risk averse and change their currency preferences.

Therefore, the strategic considerations of the composition of currency pricing portfolio will matter for understanding the effects of the exchange rate shocks on international trade with heterogeneous exporters and by-turn some of the dynamics of the international trade. The endogenous currency decision of the firm is a complex phenomenon that has to be investigated in broad.

Economic theory has long debated the importance of currency pricing (or currency choice) in both of its major fields. The macroeconomic research in the area has indicated that different currency pricing can affect the major macroeconomic variables such as volatility of the exchange rate (Betts & Devereux, 1999) and alter the optimal monetary policy (Devereux & Engel, 2003). The current trade literature emphasizes the heterogeneous reaction of firms to the exchange rate volatility in their exporting activity. We aim to add to the existent argument the discussion on the influence of the currency choice on the exporting activity and, by turn, heterogeneous exchange rate pass through for different firms. Some researchers (Amiti *et al.*, forthcoming) have indicated that in exports and imports to the USA the exporters and importers that chose USD or not-USD for their transactions had different exchange-rate pass-through and durations of price adjustment. Understanding the motives for the currency pricing and consequences of the adopted choices is crucial in understanding the development of the international trade. As we have discussed above, the currency pricing ultimately indicates the exposure to the exchange rate shocks among the exporters and affects international trade flows. The exchange rate is repeatedly indicated as having a significant impact on the international trade (Hericourt & Poncet (2012), 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). Therefore, understanding the currency pricing strategies and there consequences for heterogeneous exporters could shed light on the Diversificatione effect of the exchange rates on the heterogeneous exporters. 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) - 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 motivations. We show that it is crucial to acknowledge the existence of the third choice in the micro analysis, since exporting heavily relies on it. The option to go for the non-trading partner currency is a significant parameter in firm's activity, that is in fact a prevalent decision when the firm's trade grows.

The paper is organized as follows. Section 2 provides the literature review and discusses the main motives behind the currency pricing. 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

The macroeconomic literature has long been concerned with the determinants of the currency pricing, as well as about how various currency pricing can overturn the predictions of the main economic fundamentals Betts & Devereux (1999). 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. More recent research (Ito *et al.*, 2010; Friberg & Wilander, 2008; Bacchetta & van Wincoop, 2005), has indicated that there should be other considerations accounted for in the currency pricing decision.

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. One of the first recordings of the currency pricing patterns in trade goes back to Grassman (1973), Grassman (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 research that trade of differentiated products between developed and developing countries tends to be priced in the developed country's currency was also backed up by Page (1977), Page (1981). Ito *et al.* (2010) have indicated that Japanese exports were not following the so-called "Grassman law" and the question of the need of theoretical background for currency pricing was once again put on the table.

All in all, the debates around the currency pricing have drawn to discussion a large number of factors, potentially influencing the currency pricing. They could be split generally into two major groups: firm-level factors such as product characteristics, bargaining powers between parties, corporate specifics and market-level factors such as exchange rate volatility, transaction costs, and competition composition in the destination market.

Current paper is highly inspired by the research of Goldberg & Tille (2008a) and Goldberg & Tille (2008b), who formulate the endogenous currency pricing model that to our knowledge is the best fit to the factors listed above.

Goldberg & Tille (2008a) have formulated a model that is aimed at capturing the currency choice motives of the firms. This is a first model with endogenous currency choice that includes all three possible choices. The model assumes, as it is common in macroeconomics, diminishing returns to scale and downward-sloping demand for the goods. The price of the good is set before the realization of the shocks. The currency in which the price of the good is set could be represented as a "basket" of currencies (PCP, LCP, VCP) with certain shares assigned to each currency. The exporter, aimed at maximizing the expected profits from her activity, faces transaction costs in converting the basket currency back to home currency, as it is assumed she pays for all her costs in the home currency. In the two-step optimization they form a model for determining the optimal share of the currencies in the basket. At the first step the maximization problem of expected profits is solved over the given "basket" of currencies treating the prices and currency choices of all other firms as given. After determining the optimal price, the second order approximation is used in order to find the deterministic motives of the shares of currencies in that price. One of the key assumptions of the model is that if the currency basket of the exporter resembles the currency

composition of the price in the destination, then the effect of the exogenous shock (exchange rate shock) will be symmetric to the firm and to the market. That allows the firm to sustain her relative position on the market. Their model, as it will be discussed in more detail below, provided three motives for currency pricing determination - "coalescing motive", hedging motive and transaction costs, where they have assumed that the importance of the first two is much greater than influence of the latter one. In the empirical test of the described above model (Goldberg & Tille, 2008a) the authors provide an extension to the model that incorporates the role of the size of transaction for different customers, as they have observed distinctively different currency pricing patterns for big transactions. To do that, they have introduced the concept of "bargaining" motive between the importer and exporter. In contrast to the traditional view of unilateral invoicing decision of the exporter, it has provided a link between the transaction size and invoicing. The bargaining is performed over the consumer's and producer's surpluses, which represent the difference in utility levels gained when the deal is signed and when the parties fail to reach an agreement. The bargaining power of the customer indirectly is dependent on the relative size of the purchase, as the exporter gets higher utility from signing a bigger contract. Therefore, the bigger the purchase is for a given exporter, the more likely is the application of the LCP (meaning making currency choice in favour of the customer). It should be noted that in the model each importer is viewed as a separate production line, and therefore the purchases of another customer do not affect the marginal costs of production. The negotiations in general are seen as a two-step procedure: the negotiations over the currency are in the first step, and in the second step the exporter sets the price given the currency shares and the demand. The first step is forward looking, and therefore it takes into account the conditioned optimal price of the second step.

Therefore, the scientific research up to date has formulated several major motives for the exporters to decide on one or another currency for the transaction terms. The test on the significance of these motives has not been performed in full yet, and hereby with this paper we propose to perform a fuller scale test on certain set of them. The motives that we are aiming to assess are the following:

First and major according to Goldberg & Tille (2008a) is *the "coalescing" motive*. The rationale behind that is that to insure the most stable position in the destination market a firm needs to mimic the portfolio of currencies that is used on the destination market of the certain good by other firms. Then if a macroeconomic shock (in our case - exchange rate shock) is realized, the impact is symmetric to the firm as to the market, and its relative price on the market remains stable. This can be tied to as to the specific good-characteristics as well as be effected through the domestic competitors' behavior on the destination market Bacchetta & van Wincoop (2005). 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) and Goldberg and Tille 2008a, 2008b). Any given exporter of wheat is unlikely to start pricing in other currency than USD, as she cannot ensure her position relative to other prices when the exchange rate changes.

Second, the motive is *the bargaining strength of the firm on the market*. Recently (Friberg & Wilander, 2008; Goldberg & Tille, 2008a,b, n.d.) the common view of unilateral exporter bargaining power over the currency has been altered, and 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. 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. Taking after structural model of Bacchetta & van Wincoop (2005), another aspect of bargaining power formation was formulated by Goldberg & Tille (2008b) as a part of the "coalescing" effect: the higher is the presence of a certain country in a destination market, the higher is the likeliness of application of that country's currency for the transaction. This driver - the presence of home country's exporters on the market - could be separated out as a *competition composition* driver, but its influence is partially channelled to the bargaining power of the parties. We investigate this aspect through composing variables $Importshare^{i}_{d,t}$ and $Seller_barg$.

Third, *hedging opportunity* from the exchange rate movements. This is not financial hedging (which is used mostly only by the big firms and seen as an additional cost to the activity((Martin & Mejean, 2012))), but the "marginal cost hedging". This motive aims to capture the covariances between the producer's marginal costs and the exchange rates $\rho(mc_e, s_{ed})$ and $\rho(mc_e, s_{ev})$. This aspect includes the impact of the multilateral trade on the exporters.

Consider first the two country case with two currencies. An exporter i in home country A is trading with destination country D and prices in LCP. A positive exchange rate shock (appreciation of country A's currency) should have an adverse effect on exporter in country A. But if country A's exporter is getting its input from country D, that is traded also in country D's currency, the exchange rate shock can transferred into purchases of inputs from country D without adjusting the price (therefore securing the same relative position on the market). In the case of the vehicle currencies further illustration is needed. If when trading with a country D an exporter is experiencing an increase in marginal cost of production m_e, when the exchange rate s_{ed} is stable, but the exchange rate s_{ev} is increasing (depreciation of the local currency), the exporter's preference for VCP is increasing compared to LCP.

The currency hedge is depicting the fact that the exporter experiencing a relative increase in the marginal costs as an effect from the exchange rate movement, the exporter will choose the currency that will provide the highest revenue in that state. The widely-used hedging currencies are USD and EUR, as they are widely accepted vehicle currencies. Providing a full scale test for these motives is still a challenge for the economists, but we propose a test which will include certain earlier unobserved parameters, capturing the implications of existence of the heterogeneous firms. The "coalescing" motive can be split in two parts which will then contribute to product-enhanced and competition-enhanced characteristics, capturing the currency basket composition of other firms. The bargaining strength can be exploited in several ways, breaking down to the transaction-level choices of importance.

3 Data

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[1] (10-digit HS), per destination. Per each transaction the value is reported along with the specific currency of the transaction.

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.

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[2] 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.

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

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.

We currently do not restrict the sample to manufacturing, therefore we include wholesalers. 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

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

[2] This is currently a preliminary value that represents the need to discard the single "sample" transactions.

loss of information is not found to be due to any other reason but strategic[3] 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 80%. The database covers the population of all individual export transactions from Russian Federation between the 1st January 2005 and 31st December 2009.

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 2) though 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.

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 .

In 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 Tables 3a and 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 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[4] (hypertargettable3 we also find evidence that LCP is indeed more present in the smaller transactions. The other two distinctive features of the same

[3]Oil and gas, precious metals and goods of strategical value are excluded. Services are also not recorded.

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

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 distinct 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

We explain in this section first the specification of the main model in general terms. Then, after explaining explicitly how all the variables that express the currency choice motives are constructed, we give the full specifications of the tests.

Taking after Friberg & Wilander (2008) research results we assume that the same currency is used for the transaction, invoicing and settlement and referred to as above as "currency pricing". This assumption of common currency for three different operation 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 in industry i (HS6) is indexed with f , exporting good n exporting 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. 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 we have three choices, we use Multinomial Logit to test the relevance of the currency pricing motives. 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, curpricing=1 represents local currency pricing and curpricing=2 represents vehicle currency pricing. There is no order dependency, and the values represent the mutually exclusive exhaustive choice.

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 modified - firm-level - test, which utilises the firm- and competition- characteristics. We discuss the outcomes of the modified test in light of the laid out above theoretical predictions and implications. Brief discussions on the type of robustness checks performed are also reported. We also perform a country- and firm- presence test for the sake of further discussions. Then in conclusions we discuss the further implications of the results and policy relevance.

Then, the simplified version of the multinomial logistic regression takes full form of:

$$log\left(\frac{p_{ij}}{p_{i0}}\right) = Coalescing\_motive\_vars + Seller\_bargaining\_power\_vars + Customer\_bargaining\_power\_vars + Hedging\_motive\_vars + Macro\_controls + \delta_t + \lambda_d \quad (1)$$

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. Then the positive loglikeliness (relative risk ratios reported in the Appendix) indicates that the increase in the according variable by 1 unit have positive log likeliness effect on applying one of (be LCP or VCP) the trading partner currencies. The negative sign on the significant coefficient therefore indicates the lenience to VCP when the variable is increasing.

The coalescing motive is tested in two ways: through the product-enhanced and competition-enhanced characteristics. The product-enhanced part test is taken after Goldberg & Tille (2008b). The set of dummies is constructed according to the Rauch (1999) classification (based on the level of elasticity of substitution): organized exchange traded, reference-priced and differentiated goods. 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.

Along the lines of GT we model the dummies $Walrascon^i$ and $Refcon^i$ for the walrasian goods and reference priced respectively. The homogeneous goods are the reference category. The HS6[5] system is applied for the definition of the dummies at each category. For the analysis we expand the Rauch classification to capture all the categories of goods served by Russian exporters. The dummies capture mostly the internal characteristics of the product, leaving the competitors-behavior out from consideration. The better (modified) test would be to not only look into the dummy, but also what currencies are applied by the competitors in the same industry (how diversified their portfolio is). The industries with higher "coalescing" motive are expected to exhibit significant positive values of log likeliness of applying LCP and PCP versus VCP when the diversification ratio is higher.

The diversification measure $Diversification_t^{i,d}$ is formed by computing a Herfindahl index of shares per each industry in a year HS4 to each destination:

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

[5]HS6 instead of HS4 that is used in GT for dummies allows us to have a greater intra-industry precision.

$HH_{hs4,d,-f}$ denotes the Herfindahl-Hirshman, calculated for each firm at each destination-HS4 product pair in a period in a following way:

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

Where $sharecur_{k,d,-f}$ 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).

$$sharecur_{i,k,d,-f} = \frac{\sum\limits_{-f}\sum\limits_{tr} transaction\_value^{i,d,t,f,tr,k}}{\sum\limits_{-f}\sum\limits_{k}\sum\limits_{tr} transaction\_value^{i,d,t,f,tr,k}}$$

Value of Diversification index is bounded between $[0; 0.67]$. 0 Diversification implies that all HS4 competitors at the destination do extreme currency pricing and price only in one choice, notably VCP. We restrict our sample to only country-product pairs that have the competitors' extreme behavior is corresponds to this fact for the the better descriptivity and interpretation of the results. The discussion of the reasons and why that is allowed for our sample is in the Appendix 1.

Therefore, the Diversification measure captures the behavior of other exporters from Russia at the given destination-market and captures the competitors' behavior. Through ruling out the own firm's exports we aim to exclude endogeneity of the measure. This mechanism has been highly exploited in development and trade literature. As we are working with behavior-like measure, we acknowledge the existence of (Manski, 1993) reflection problem[6] here, and therefore 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. Nevertheless, we can assume that the closest "reference" for pricing behavior at the destination-market is achieved from observing the pricing behavior of the firms from the same origin. Therefore, we assume to find a significant effect of such Diversification ratio on likeliness of PCP and LCP (compared to VCP), and the higher increase in likeliness of application of PCP, as it is assumed to be more preferred by the exporters. We also assume that this measure will be more significant for the smaller exporters, as they are more exchange rate risk averse then the bigger ones, and will strive for higher resemblance of the competitors' portfolio as to remain the same relative position on the market when the exchange rate shock comes.

All this forms into the new hypothesis:

*H*ypothesis: The more Diversification is the existent pricing at the market, the more likely the marginal exporter is to price in LCP and VCP.

We leave out of the scope of this paper a further subject for investigation and research: if the companies with the highest resemblance of their portfolio to the industry-destination specific portfolio are relatively more successful on a given market due to the transmission of the exchange rate shocks to all agents symmetrically. The intuition would be, that the small exporters who ship relatively small amounts and to a limited number of customers at the destination, this "replication" is hard to achieve. By-turn they are therefore more exposed to the exchange rate shocks.

If we assume that small exporters are more exposed to, for example, customer bargaining, which forces them to apply only LCP, whereas bigger exporters are less constrained and diversify their choices, then we can expect a certain mismatch of exchange rate shock transfer. Namely, if we consider exchange-rate pass-through, the relative exchange rate pass-through for big firms will be much smaller. And conversely, if in this situation the exchange rate shock was greater to VCP then LCP, then the small exporter will have a relatively smaller price-adjustment.

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. In the GT model part, we construct the variables alike the ones in the original paper. $Cust\_barg\_ag^{tr}_{i,d,t}$ acts as the aggregated, so to say, macro-level measure of customer bargaining and represents the share of the transaction tr in the total imports

[6] In our framework it means 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 me doing k choice. This has been a big debate in the literature that is concerned with agent-behavior.

(from all trading partners) to the destination d of product i in year t.

$$Cust\_barg\_ag^{tr}_{i,d,t} = \frac{transaction\_value^{i,d,t,f,tr}}{total\_import^{i,t,d}_{COMTRADE}}$$

We do not have per-transaction composition of imports as in the original model. But as in distinction from proxy for the customer bargaining power as a dummy for the top 5% transactions of the imports we use the share of the transaction in total imports, we expect to capture the same effect[7]. We get significant negative log likeliness of application of PCP versus VCP.

The bargaining power of the seller (at the aggregated level) is calculated as in GT model through the share of imports of Russia at the destination. The corresponding variable is $Importshare^{i}_{d,t}$, calculated at HS6 level.

$$Importshare^{i}_{d,t} = \frac{\sum_{f}\sum_{tr} transaction\_value^{i,d,t,f,tr}}{total\_import^{i,t,d}_{COMTRADE}}$$

In the modified test we exploit the firm-dimension and look into the relative power of the customer's size on the firm's pricing ability. As we cannot track the buyer ids, we pursue the transaction-level proxies for the relative power of the customer. Variable $Cust\_barg^{tr}_{i,d,t,f}$ represents the market share of the firm transaction and is calculated as the relative share of the transaction to all i product exports of the firm f to the destination d in year t [8].

$$Cust\_barg^{tr}_{i,d,t,f} = \frac{transaction\_value^{i,d,t,f,tr}}{\sum_{tr} transaction\_value^{i,d,t,f,tr}}$$

The bargaining power of the specific exporter to the buyer is measured through the share of all firm's exports to the destination in the total imports of the product at the destination through the variable $Seller\_barg^{tr}_{f,d}$ [9].

$$Seller\_barg^{tr}_{f,d} = \frac{\sum_{tr} transaction\_value^{i,d,t,f}}{total\_import^{i,t,d}_{COMTRADE}}$$

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

The bargaining motive is therefore tested on two different levels: macro - $Cust\_barg\_ag^{tr}_{i,d,t}$ and $Importshare^{i}_{d,t}$ - and firm - $Cust\_barg^{tr}_{i,d,t,f}$ and $Seller\_barg^{tr}_{f,d}$. This is done not just to compare the initial GT test to our modified test, but also to see if the same motives will have the same influence at macro and micro levels. We indeed find that consideration at different levels appear to be different, as, for example, the increase in $Importshare^{i}_{d,t}$ improves the likeliness of application of trading partners' currencies, but increase $Seller\_barg^{tr}_{f,d}$ in fact decrease the likeliness of the application of VCP. This is what we call "love for dollar" and further discuss in the results section.

The hedging motive is tested through constructing the same variables as GT: $USDhedge$, $EURhedge$. All dummies are constructed for each 1-quarter period and take value of 1 when the currency 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[10].

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

[7] We have also run it with the dummy for being more then 5% of the total imports and got similar results

[8] 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.

$$Cust\_barg\_2^{tr}_{i,d,t,f} = \frac{transaction\_value^{i,d,t,f,tr}}{\sum_{tr}\sum_{d} transaction\_value^{i,d,t,f,tr}}$$

[9] We achieve the similar results (and stronger for 50%) when we look at the dummy for having a share in exports to the destination exceeding certain value (50% and 30%).

[10] See Appendix for the description of the construction.

EUR). We do not need to 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 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.

Macroeconomic environment variables:

$Coefvar_d$ 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 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. The higher is the value, the more likely the exporter to price in PCP or VCP.

Eurozone is a dummy indicating the EU country. Dummy *Dollarpeg* describes the countries that have official or semi-official dollar pegging in their economies.

Full multinomial logit specification with variables therefore is:

The aggregated test is specified as:

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

The firm-level test has a form of:

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

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.

All estimations are performed with Region fixed effects instead of Destination fixed effects. 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, but yet we cannot do that. We have though tried with the income-group fixed effects and the results remained the same.

[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

5 Results

We now turn to the empirical tests of the formal theory of the currency pricing based on our data. In previous sections we have devised an econometric test that is aimed to capture the influence of the determinants of currency pricing as implied by the existent literature over the population[12] of the Russian transactions of the exporters. 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, curpricing=1 represents local currency pricing and curpricing=2 represents vehicle currency pricing. There is no order dependency, and the values represent the mutually exclusive exhaustive choice.

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

First we present the results from the aggregated test and see what are the determinants that lead the exporters to one or another type of currency pricing considering all the motives on the aggregated level. This closely relates to the test of Goldberg & Tille (2008b), so we expect to have similar results.

After that we exploit the firm-dimension and investigate the same motives at the firm-level. We discuss the strategic part of firms' behavior in their currency pricing. This is possible as we can track all home (Russian) exporters at any destination. We look in the competition influences in currency pricing, and discuss the difference that the small and big firms appear to exhibit. Note that results on alternative specification of split between the small and big exporters is included in the appendix.

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 results hold if we omit this category. 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.

The split of the 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 2 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.

We use Akaike informative criterion (AIC) to compare explanatory power of the alternative combinations of the variables. The scores are provided for comparison in a separate table (). 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 magnitude of the effects cannot be compared across the samples due to the construction. Therefore, only inference on the significance and direction of the motives can be cross-compared between the different samples. The comparison of the magnitude can be done within different specifications over the same sample.

Aggregated test of currency pricing determinants

In order to make further analysis of the currency pricing, we first perform an aggregated level test, alike the initial test of GT model (Goldberg & Tille, 2008b). (regressions 1 and 2) provides the results of the multinomial logit built on the close-enough proxies for the main GT variables. As we are estimating multinomial logit, the coefficients do not indicate the marginal effects, but the log effect magnitude to the baseline category. For all the regressions the baseline category is VCP. In Appendix we provide the results for the main regressions in relative risk ratios.

Utilizing tractable firms, we also split the sample into big and small exporters based on the 75^{th} percentile firm with product-destination pairs, and see if the same reliance on the factors is held. The exporters are recorded to the sample of big if their trade exceeds 11 product-destination pairs in a year. The results of the split sample are recorded in : regressions 3 and 4 - big exporters, and 5 and 6 - small exporters.

[12] After cleaning as described in section 4.

Overall, we get some different patterns then as predicted by the existent theory. The results on testing the coalescing motive provide a prediction is based on the Rauch indexes. We get positive relation between the type of good and the likeliness of pricing PCP and LCP, which are most likely for the differentiated goods ($Walrascon_i = 1$). The means that there is clear stronger preference for pricing dependent on the type of exchange of the good, and the vehicle currency overwhelms the choice of currency for the trade of homogeneous goods. The supportive result is then:

- There exist dependency between the type of the traded good and currency pricing decisions.

The implementation of the aggregated coalescing motive remains the same for the heterogeneous firms, where smaller exporters are more likely to implement differentiated currency pricing for the reference-priced goods. This indicates that conditioned on the type of good based on Rauch classification, *smaller exporters prefer to use more the bilateral trade-partners' currencies.*

We find that the increase in customer bargaining power $Cust\_barg\_ag^{tr}_{i,d}$ provides some sort of the supporting evidence of the role of the customer bargaining power: the bigger is the share of the transaction in import - the more it is prone to the customer bargaining powers and the less likely is the application of PCP to it, but it does not necessarily increase the use of the local currency. Moreover, the effect seems to be coming from the big exporters and does not seem to be present for the small exporters[13] We discuss this finding further in the light of theory presented by Goldberg & Tille (n.d.), which show that the bigger combination of a bigger seller and a bigger customer might lead to change preferences for both of them (in our setting) and lead them to take on higher exchange rate risks.

The presence of the country at the destination market influences the motivation of firms to set their price not only in PCP relative to VCP, but also LCP relative to VCP (variable $Importshare^i_{d,t}$[14] in , regressions 1 and 2). This means that by increasing the presence in another country's trade (on HS2, HS4 or HS6 level), the trading partners are more likely to increase reliance on the partner's currency, rather than on VCP. This partially differs from the theoretical prediction of (Bacchetta & van Wincoop, 2005) that the increase in presence of the country at the destination the use of the exporter's currency becomes more likely, when the use of importer's currency becomes less likely. When heterogeneous exporters are concerned, we see that the smaller exporters are more likely to use both of the partners' currencies. This result is stable for robustness checks of "No metals"[15] and "No crisis"[16]. This provides an interesting bridge to the macroeconomic literature and its policy applications:

- enhancement of trade increases the demand for both of the trading partners' currencies among trading partners and, therefore, makes them more lenient to each other's shocks.

As the effect is significant more for smaller exporters, we can reason out that the smaller exporters are more prone to the macroeconomic shocks in trading partners' economies. This implies *that country presence at the destination increase the bargaining power of the smaller firms*, which is an supporting fact to (Bacchetta & van Wincoop, 2005) prediction that the higher number of home firms at the foreign destination change the transmission of the exchange rate shock, and make PCP an optimal choice for trade[17].

Therefore we form a new empirical evidence:

- The expansion of trade leads to higher use of the trade partner currencies in their trade relations.[18]

[13]Below we also construct an alternative test for the bargaining powers utilizing the logic presented in Bacchetta & van Wincoop (2005) who show that with the increase of the number of country A firms selling at country B, then the optimal currency pricing decision will be moved from LCP to PCP.

[14]$Importshare^i_{d,t}$ is calculated for the baseline on the HS6-product market. This implies that the test is done for the shares at the HS6-level market. Similar results were achieved for the implementation of the test at the HS4 and HS2 level. The initial GT test was done on the HS2 level, and we find it interesting that the result of the macro-level test hold for HS2, HS4 and HS6. The results for when we construct a firm-level test are different

[15]The same regression is run omitting the exports of "Basic metal and minerals", which constitute to most of the exports (85%) and highest-value transactions.Results are provided in

[16]The same regression is run omitting 2008-2009 period, which might be a subject to different structural changes. Results are provided in

[17]They are implementing a two-currency model.

[18]It is conventional belief that increasing trade increases the use of partners' currencies, and has been an arguement

The hedging motive consideration produces some other puzzling evidence: both better hedge in euros and better hedge in dollars increase the likeliness of the use either of PCP or LCP[19]. 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.

This finding can be illustrated on an example: the exchange rates between the A and B trading partners remain the same, whereas A's marginal costs of production increase and the exchange rate of partner A towards C also increases (depreciation of the currency A). Then an exporter will actually become more likely to use currencies of her own and her trading partner B. This is a puzzling result which we plan to investigate through adding import intensity measures in future.

As it was explained in the conceptional framework, hedging determinant deals with the correlation between the marginal costs and the exchange rates, and the effect is more pronounced within the firms that use imports from various sources abroad. Unfortunately, we do not possess information on firm imports in order to build-up a clearer test of the motive.

Another interesting insight in the patterns of currency pricing is obtained from the exchange rate variation measure - the greater is the variation of the destination exchange rate comparing to the domestic exchange rate variation, the more likely becomes the usage of not the domestic currency, but VCP. We do not have any feasible explanation of this finding, and treat it as a first indication of a certain excessive "love for dollar" among exporters, that will be discussed further.

Firm-level test of the currency pricing determinants

As it was previously discussed by the Goldberg & Tille (2008a) the actual bargaining power of the customer is determined at the firm-level. Therefore, we improve the test by using the firm-level bargaining indicators, which represent the transaction share in the total product exports of the firm to the destination $Cust\_barg^{tr}_{i,d,t,f}$[20].

The results provide us with the first difference from the GT original estimation at the macro-level - the exporter is more likely to use PCP, whereas the likeliness of LCP. As a further matter, this pattern is observed for big exporters, and it holds for higher likeliness of PCP among the small exporters. One of the potential explanations of this puzzle could be found behind the finding of the Goldberg & Tille (n.d.) paper - the bigger is the purchase, the more exchange risk the buyer is willing to take on.

- The higher is the relative size of the purchase for the exporter, the more likely she is to apply her own currency and the less likely is the application of the partner's currency.

It was discussed before that when the seller bargaining power is proxied through the import shares ($Importshare^{i}_{d,t}$), we observe higher likeliness of PCP and LCP relative to VCP with the increase in trade. Nevertheless, this seem to be not the case for the firm-level seller bargaining power estimation - we observe higher likeliness of VCP use when the firm is increasing its presence at the destination. Therefore our case provides us with new evidence of currency pricing behavior, which we call "the love for dollar"[21].

- The higher is the share of firm sales in imports at the destination, the more likely it is to use vehicle currency for its pricing.

The two last findings - which are novel to literature - might be perspectively explained through the extension Goldberg & Tille (n.d.). The bigger customers and bigger sellers are less concerned about the exchange rate risks. In the framework of two currencies it leads to, for example, following

in multitude of political- and policy-decisions, but to our knowledge, this is the first empirical study that find supporting evidence.

[19] 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.

[20] We also have performed the test with an alternative measure of transaction share in the product exports of the firm across all destinations $Cust\_barg\_2^{tr}_{i,d,t,f}$ The results have remained the same as for $Cust\_barg^{tr}_{i,d,t,f}$, and are reported in in Appendix 2

[21] The result is significant across robustness checks with the exception of PCP to VCP likeliness among small exporters - see and

relation: when a bigger customer buys something from a smaller exporter, the smaller exporter will be more likely to get his preferred choice of PCP. This can be therefore contributed as an explanation for the positive likeliness of PCP and negative of LCP comparing to VCP for the increase in customer bargaining power when we control for the seller bargaining powers, type of the product, etc.

The logic although becomes more complicated when looking at a scenario with 3 alternative currency pricing choices. We believe that the weaker preferences for the domestic currency and weakening of risk aversion for higher purchases might be driving the "love for dollar" result of the seller bargaining. The greater is the presence of an exporter at the destination increases the likeliness of her being less concerned about the currency choice. Without having clear preferences, she takes up the more "neutral" currency to any destination - "vehicle" currency.

We also add a new indicator for the "coalescing", as we have discussed above, in order to capture the effect of the industry competition behavior on the currency pricing behavior. It is assumed that the currency diversification ratio is expected to have higher relevance for the less diversified good. This comes from the fact that the more homogeneous the good is, the bigger the adverse affect of the pricing not alike as your competitors would be on the outcome. For the markets of the heterogeneous goods the effect is also present, but there the mismatch with the competitors' behavior does not give the same effect on the firms. Therefore, the diversification of the competitors' portfolios at the destination influences positively the choice in favor of PCP and LCP.

Utilizing the analysis of the competition-composition we see that indeed the higher Diversification of the exporter's competitors at the destination increases the likeliness of applying LCP and PCP, and this effect is more persistent for the small exporters.

Therefore the following facts can be recorded:

- The likeliness of a given exporter applying LCP or PCP increases, the more diversified choices her competitors at the destination do, with PCP application being more likely than LCP.
- Diversification matters more for the decision of the smaller exporters to diversify.

As a form of an additional comparative test, we look into the outcome for when we control the both - the presence of the country-exporters at the destination market ($Importshare^{i}_{d,t}$ and $Cust\_barg^{tr}_{i,d,t}$[22]) and the presence of the firm at the destination market ($Seller\_barg f, d$). We call this test "Test of the firm and country presence in the country". The results are reported in . As discussed above, Bacchetta & van Wincoop (2005) state that the presence of other home firms at the destination market could overturn optimal currency pricing. We have also established the opposing effects between the country-presence at the market and company-presence. The question is therefore, what will be the patterns of the currency pricing when we put both of the controls in the model.

From we see that for the whole sample the predicted before results hold - whereas the presence of the home country at the destination market increases reliance on the trade partners' currencies, the increase in the exporter's sales will still increase the usage of VCP. It has to be noticed though, that the effect is mostly driven by the big exporters, while the small exporters will only exercise their bargaining powers in decreasing the usage of LCP.

6 Conclusions

In this paper we have addressed the determinants 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 existent theory we have investigated the currency

[22] $Cust\_barg^{tr}_{i,d,t,f}$ as before represents the share of an individual transaction tr in the total sales of the firm f of product i in the destination d:

$$Cust\_barg^{tr}_{i,d,t,f} = \frac{transaction\_value^{i,d,t,f,tr}}{\sum\limits_{tr} transaction\_value^{i,d,t,f,tr}}$$

$Cust\_barg\_ag\_2^{tr}_{i,d,t}$ serves as a measure of the presence of the firm at the destination.

choice of the Russian exporters and attempted to improve the understanding of the realization of the motives for the heterogeneous exporters. By investigating the novel confidential dataset we find that existent theory does not fully capture the explanation of currency pricing behavior of the exporters. We also show that for heterogeneous exporters the realisation of the motives is different, as, for example, increase in bilateral trade effects the currency choice behavior of the smaller exporters rather then big ones, and smaller exporters being more exposed to the competition pressure of choices of their competitors.

We have considered a three-choice model of producer currency pricing (PCP), local currency pricing (LCP) and vehicle currency pricing (VCP), therefore we expand the usual empirical trade approach of bivariate choice between PCP and LCP. We show that VCP is used more than expected in theory, and in actual fact the exporters may posses certain "love for dollar" in their exporting activities, as they are more likely to switch to VCP even when they have enough bargaining power to do so. This implies that in international trade much of the activity is a subject to risk from the exchange rate fluctuations with the currency of a country, that is not engaged in trade.

It should be noted that via exhibiting the "love for dollar" the bigger exporters change the composition of the currency pricing at the destination, increasing the likeliness of application of VCP by the smaller exporters. This moves their optimal choice and potentially provides them with lower utility.

Until conclusions we do not mention the transaction costs that the exporters are facing when they use various currencies, and this is done on purpose as the current macro literature assumes low transaction costs (Rey, 2001) and we can eliminate then from the general model. But we cannot leave this discussion out. By applying other then home currency at the destinations, firms accumulate foreign currencies. As mentioned in Friberg & Wilander (2008) big firms can held the foreign currencies on their account due to the higher turnover, and exchange them with a more favorable exchange rate. Or use these foreign reserves to buy inputs from abroad, as it has been shown that the biggest exporters are at the same time the biggest importers (Amiti *et al.*, forthcoming). The smaller exporters do not possess these options, as they are more dependant on the cash-at-hand as they need to pay the wages of their firms' workers and also for inputs. To get the cash-at-hand demanded, the smaller exporters have to convert the foreign currency much sooner after its arrival, which can eliminate greater share of the smaller exporters' profits, even driving them to negative. This comes from the fact that the transaction costs for them represents higher share of profits, and they cannot afford the wait, they might get exchange rate which is higher then the one that bigger exporters are Therefore, by exhibiting "love for dollar" the international trade lowers gains of the small firms buy moving upwards the cost of exporting.

We find supporting evidence that the type of good does matter for currency pricing behavior of the exporters, and there is competition-pressure on the pattern of pricing behavior. The exporters tend to be guided in currency pricing by the destination-specific competitors' behavior, as this matters for the preservation of the relative competitiveness. This implies that the more homogeneous is the good, the less the competitors diversify their currency choices as exchange rate shock will have higher impact on the exporters who deviate more from the common currency pricing benchmark, and the less they have actual say in currency pricing.

We record the fact that the smaller exporters exhibit higher usage of LCP - as they are facing higher bargaining power from their buyers. The evidence is found that supports the idea, that bigger exporters are less sensitive to the exchange rate shock and therefore they are willing to take higher exchange rate risks through not exposing preference for PCP when their share increases. We also show that the same process is exhibited when considering bigger customers, as they also do not increase preferences for LCP when they are gaining higher bargaining power. Therefore, we find that when such situation is present at the both sides of the contract, the currency pricing is done in favor of neither of the partners' currencies, but for VCP - therefore they exhibit certain "love for dollar". This potentially implies that the bigger exporters are subject to a different sort of the exchange rate exposure than the smaller ones, as they are more exposed to the exchange rate shocks of a third party rather then their trade partner.

This finding contributes to the vast empirical trade literature on the exchange rate pass-through: the bigger trade partners (implying a given firm-to-firm relation) are less concerned about the domestic currency choice, so they exhibit lower exchange-rate pass through to the currency of their trade partner. Therefore the firms that relatively heavily choose the third party's currency,

will not be affected by the exchange rate shocks in the same manner as the ones who have to have more of their transactions in the destination currency.

As it has been shown in the previous empirical research, financial hedging is employed only by the big firms, and only for some of their LCP transactions. Also, big exporters potentially face lower risks by using LCP, as they generally use more currencies and therefore can "pool" the risks, or use the same currency for the later transactions. Therefore, higher exposure to the destination-specific exchange risks harm smaller exporters more heavily, as they acquire less utility from their LCP transactions. This stratification is a consequence of different strategic consideration of the firms and buyers with different bargaining power potentially leads to higher rates of failure of the exports of the small firms. At the same time we find that increase of bilateral trade may lead to higher use of the bilateral trading currencies by the partners. In fact, this effect comes mostly from the big exporters, so we can presume that the expansion of trade changes preferences in favor of the partners' currencies.

There has been a long debate among politicians, specialists and policy makers about the need to establish better trade relations in order to increase the circulation of the local currencies or, alternatively, decrease dependence on the third party's currency. To our knowledge, this has been a "blind shot" as there has never been established a theoretical or empirical link between this occurrences. We provide therefore first evidence to this fact, and it can be used for further policy implications.

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. There is a need for further research to understand the formation and impact of currency choice. One of the potential researches can include further investigation of the "love for dollar" 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.

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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

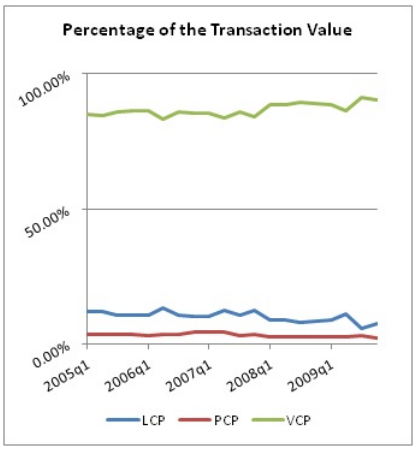
Distribution of the firm sizes and pricing type		0-25%	25-50%	50-75%	75-90%	90-95%	95-99%
Mean transaction value	LCP	117773.9	106644.3	148789.8	201547.2	210496.2	311179.8
	PCP	33849.5	28646.74	26397.3	29620.3	35342.0	31004.5
	VCP	203208.4	155739.6	188421.1	174836.5	177972.1	181970.6
Mean transaction 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

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

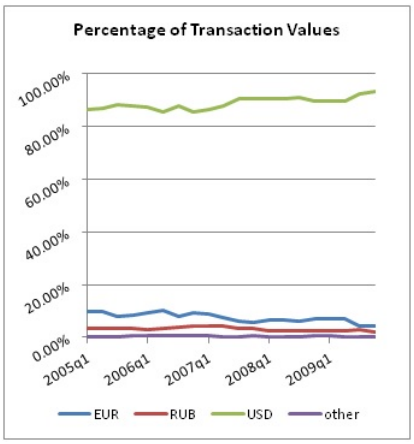
Table 4: areg for characteristics (R-squared reported)

	(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	8,336,450	8,336,450	8,336,450

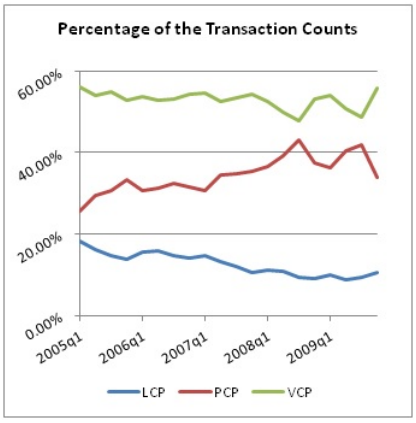
Figure 1: Currency and Currency Pricing in Russian Exports



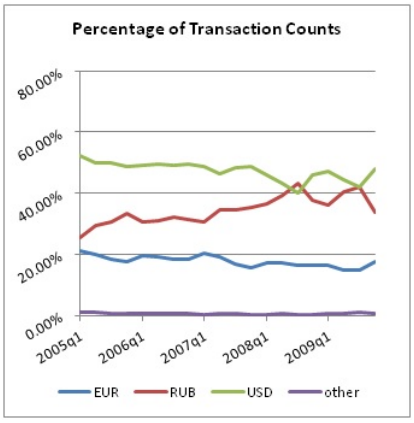
(a) Currency Pricing by value over time



(b) Use of Currencies by value over time



(c) Currency Pricing by count over time



(d) Use of Currencies by count over time

Table 5: Testing the GT model

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Walrascon	1.340***	2.480***	1.165***	2.210***	2.001***	3.240***
	(0.110)	(0.192)	(0.124)	(0.231)	(0.156)	(0.190)
Refcon	0.321***	2.090***	0.124	1.929***	1.149***	2.833***
	(0.106)	(0.184)	(0.115)	(0.207)	(0.155)	(0.247)
Cust_barg_ag	-0.686***	-1.616***	-0.770***	-1.151***	-0.0391	-3.215***
	(0.128)	(0.248)	(0.143)	(0.240)	(0.221)	(0.535)
Importshare	0.265**	0.771***	0.232	0.575***	0.254*	0.661**
	(0.124)	(0.198)	(0.145)	(0.203)	(0.139)	(0.260)
USDhedge	0.200***	0.202**	0.210***	0.246***	0.171**	0.0871
	(0.0645)	(0.0974)	(0.0714)	(0.0942)	(0.0849)	(0.174)
EURhedge	0.181**	0.153**	0.158*	0.116*	0.364***	0.361***
	(0.0845)	(0.0658)	(0.0911)	(0.0636)	(0.112)	(0.139)
Euroarea	-0.179**	3.928***	-0.297***	3.715***	0.362***	4.688***
	(0.0855)	(0.137)	(0.0840)	(0.153)	(0.134)	(0.194)
Coefvar2	-2.695***	-0.763**	-2.898***	-0.884**	-2.344***	-0.370
	(0.258)	(0.313)	(0.272)	(0.414)	(0.458)	(0.420)
Constant	-1.473***	-6.612***	-1.396***	-6.408***	-1.664***	-7.034***
	(0.129)	(0.285)	(0.137)	(0.325)	(0.219)	(0.312)
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
Clusters	20992	20992	19618	19618	16786	16786
Convergence	1	1	1	1	1	1

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

Table 6: Modified test of the GT model

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.419***	-0.334***	0.335***	-0.429***	0.560***	-0.181
	(0.0463)	(0.0808)	(0.0523)	(0.130)	(0.0750)	(0.137)
Seller_barg	-0.946***	-1.217***	-1.073***	-1.100***	0.121	-1.250***
	(0.126)	(0.247)	(0.136)	(0.268)	(0.187)	(0.468)
Walrascon	0.278*	0.879***	0.101	0.755***	0.864***	1.448***
	(0.162)	(0.165)	(0.176)	(0.236)	(0.169)	(0.259)
Refcon	-0.0793	0.905***	-0.262	0.731***	0.591***	1.720***
	(0.161)	(0.167)	(0.171)	(0.229)	(0.185)	(0.232)
Diversification	1.472***	0.437*	1.529***	0.428	1.297***	1.014***
	(0.121)	(0.240)	(0.140)	(0.268)	(0.173)	(0.337)
USDhedge	0.0521	0.177**	0.0366	0.207**	0.127	0.0992
	(0.0445)	(0.0826)	(0.0494)	(0.0825)	(0.0780)	(0.147)
EURhedge	0.197***	0.171***	0.193***	0.111*	0.304***	0.397***
	(0.0518)	(0.0599)	(0.0568)	(0.0635)	(0.0913)	(0.119)
Dollarpeg	1.961***	4.832***	2.180***	4.923***	1.700***	5.893***
	(0.226)	(0.254)	(0.257)	(0.280)	(0.482)	(0.569)
Euroarea	-0.331***	2.203***	-0.233***	2.274***	-0.376**	2.117***
	(0.0870)	(0.161)	(0.0896)	(0.187)	(0.150)	(0.229)
Coefvar2	-1.032***	-0.127	-1.249***	-0.535	-0.571*	0.650
	(0.197)	(0.334)	(0.188)	(0.483)	(0.334)	(0.527)
Constant	-2.454***	-5.478***	-2.316***	-5.315***	-2.905***	-6.302***
	(0.183)	(0.245)	(0.193)	(0.314)	(0.223)	(0.338)
Observations	7,736,634	7,736,634	5,733,982	5,733,982	2,002,652	2,002,652
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18134	18134	16950	16950	14322	14322
Convergence	1	1	1	1	1	1

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

Table 7a: AIC scores for samples/specifications

Full Sample		Big Exporters	Small Exporters
Model	AIC score	AIC score	AIC score
Original	9773566.136	4897569.980	2002144.684
Modified	6584072.385	5146083.709	1386928.160
Alternative modified	6575408.419	5140325.804	1385504.284
Country and firm presence test	6565013.266	5123871.092	1386169.677
No metals	7383428.295		
No crisis			

Table 7b: BIC scores for samples/specifications

Full Sample		Big Exporters	Small Exporters
Model	BIC score	BIC score	BIC score
Original	9774124.895	7697881.647	2002647.871
Modified	6584793.182	5146788.929	1387578.680
Alternative modified	6576129.215	514031.023	1386154.804
Country and firm presence test	6565761.785		1386845.216
No metals	7383428.295		
No crisis			

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

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 $\rho(m_{ed}, s_{ed})$ and $\rho(m_{ev}, s_{ev})$. 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.

Diversificationification index constraint

As mentioned in the main text, Diversificationification 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 Diversificationification indexes are obtained:

Tables 8-1 to 8-4: Different Diversificationification scenarios

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

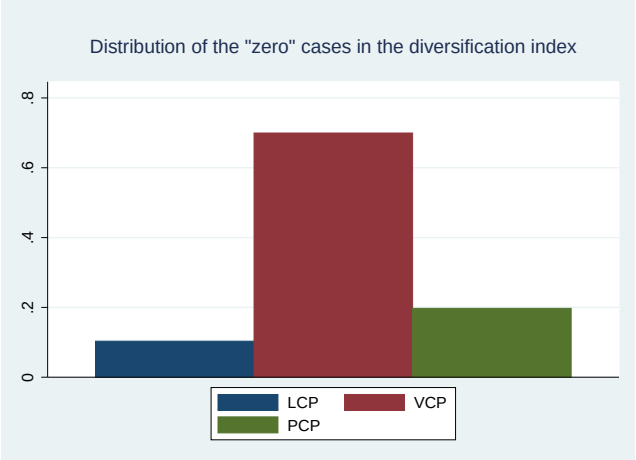
Scenario 2: Extreme Pricing 1		
CC	share	
VCP	1	Diversificationification index
PCP	0	0.0
LCP	0	

[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
VCP	0	0.0
PCP	1	
LCP	0	

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

Scenarios 2 and 3 indicate that statistically, the Diversificationification 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 $HH_{hs4,d,-f} = 1^2_v$, or in other words, the competitors price only in VCP. If this condition is fullfilled, then the increase in Diversificationification 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 Diversificationified 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 Diversificationification 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 Diversificationification 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 Diversificationification index has the meaning of "Diversificationifying 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.

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.

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 9-1: 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 9-2: 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 9-3: 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

[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

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.

9 Appendix 2

Table 10: Full results of the modified test of the GT model

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.419***	-0.334***	0.335***	-0.429***	0.560***	-0.181
	(0.0463)	(0.0808)	(0.0523)	(0.130)	(0.0750)	(0.137)
Seller_barg	-0.946***	-1.217***	-1.073***	-1.100***	0.121	-1.250***
	(0.126)	(0.247)	(0.136)	(0.268)	(0.187)	(0.468)
Walrascon	0.278*	0.879***	0.101	0.755***	0.864***	1.448***
	(0.162)	(0.165)	(0.176)	(0.236)	(0.169)	(0.259)
Refcon	-0.0793	0.905***	-0.262	0.731***	0.591***	1.720***
	(0.161)	(0.167)	(0.171)	(0.229)	(0.185)	(0.232)
Diversification	1.472***	0.437*	1.529***	0.428	1.297***	1.014***
	(0.121)	(0.240)	(0.140)	(0.268)	(0.173)	(0.337)
clear_shareLCP	1.851***	3.990***	1.429***	3.615***	2.806***	4.973***
	(0.157)	(0.199)	(0.181)	(0.210)	(0.224)	(0.276)
clear_sharePCP	3.743***	1.341***	3.686***	1.161***	4.034***	1.743***
	(0.0893)	(0.222)	(0.0921)	(0.248)	(0.152)	(0.301)
USDhedge	0.0521	0.177**	0.0366	0.207**	0.127	0.0992
	(0.0445)	(0.0826)	(0.0494)	(0.0825)	(0.0780)	(0.147)
EURhedge	0.197***	0.171***	0.193***	0.111*	0.304***	0.397***
	(0.0518)	(0.0599)	(0.0568)	(0.0635)	(0.0913)	(0.119)
Dollarpeg	1.961***	4.832***	2.180***	4.923***	1.700***	5.893***
	(0.226)	(0.254)	(0.257)	(0.280)	(0.482)	(0.569)
Euroarea	-0.331***	2.203***	-0.233***	2.274***	-0.376**	2.117***
	(0.0870)	(0.161)	(0.0896)	(0.187)	(0.150)	(0.229)
Coefvar2	-1.032***	-0.127	-1.249***	-0.535	-0.571*	0.650
	(0.197)	(0.334)	(0.188)	(0.483)	(0.334)	(0.527)
Constant	-2.454***	-5.478***	-2.316***	-5.315***	-2.905***	-6.302***
	(0.183)	(0.245)	(0.193)	(0.314)	(0.223)	(0.338)
Observations	7,736,634	7,736,634	5,733,982	5,733,982	2,002,652	2,002,652
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES S
Clusters	18134	18134	16950	16950	14322	14322
Convergence	1	1	1	1	1	1

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

Table 11: Alternative measure of cust_barg2 (share of transaction in all sales of the firm)

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
cust_barg2	0.717***	-0.120	0.643***	-0.316**	0.752***	0.0286
	(0.0463)	(0.0914)	(0.0503)	(0.143)	(0.0857)	(0.136)
Seller_barg	-0.931***	-1.185***	-1.058***	-1.072***	0.130	-1.211***
	(0.127)	(0.245)	(0.138)	(0.266)	(0.186)	(0.468)
Walrascon	0.267	0.862***	0.0885	0.740***	0.853***	1.432***
	(0.163)	(0.166)	(0.176)	(0.237)	(0.169)	(0.257)
Refcon	-0.0837	0.910***	-0.267	0.736***	0.585***	1.720***
	(0.161)	(0.167)	(0.171)	(0.229)	(0.185)	(0.232)
Diversification	1.477***	0.437*	1.536***	0.427	1.299***	1.014***
	(0.122)	(0.240)	(0.141)	(0.268)	(0.172)	(0.337)
USDhedge	0.0502	0.177**	0.0360	0.209**	0.124	0.0967
	(0.0444)	(0.0826)	(0.0494)	(0.0826)	(0.0779)	(0.147)
EURhedge	0.196***	0.170***	0.192***	0.110*	0.302***	0.394***
	(0.0519)	(0.0600)	(0.0569)	(0.0636)	(0.0907)	(0.118)
Dollarpeg	1.946***	4.814***	2.165***	4.905***	1.691***	5.884***
	(0.227)	(0.252)	(0.257)	(0.277)	(0.483)	(0.568)
Euroarea	-0.334***	2.205***	-0.238***	2.281***	-0.379**	2.110***
	(0.0869)	(0.162)	(0.0893)	(0.187)	(0.150)	(0.229)
Coefvar2	-1.022***	-0.133	-1.239***	-0.554	-0.569*	0.658
	(0.196)	(0.335)	(0.188)	(0.484)	(0.332)	(0.528)
Constant	-2.452***	-5.501***	-2.313***	-5.336***	-2.905***	-6.329***
	(0.183)	(0.245)	(0.193)	(0.313)	(0.222)	(0.338)
Observations	7,736,634	7,736,634	5,733,982	5,733,982	2,002,652	2,002,652
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18134	18134	16950	16950	14322	14322
Convergence	1	1	1	1	1	1

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

Table 12: Test of the firm and country presences in the country

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.492***	-0.221**	0.412***	-0.296**	0.564***	-0.285**
	(0.0483)	(0.0893)	(0.0544)	(0.127)	(0.0802)	(0.128)
Seller_barg	-1.270***	-1.779***	-1.531***	-1.929***	0.117	-1.017**
	(0.156)	(0.288)	(0.153)	(0.318)	(0.220)	(0.497)
Importshare	0.467***	0.734***	0.616***	0.994***	0.0106	-0.392*
	(0.100)	(0.198)	(0.0924)	(0.185)	(0.127)	(0.227)
Walrascon	0.314**	0.986***	0.165	0.918***	0.863***	1.448***
	(0.156)	(0.168)	(0.166)	(0.238)	(0.170)	(0.259)
Refcon	-0.0867	0.856***	-0.258	0.703***	0.585***	1.844***
	(0.157)	(0.163)	(0.163)	(0.229)	(0.188)	(0.237)
Diversification	1.449***	0.590***	1.519***	0.609**	1.291***	0.934***
	(0.126)	(0.227)	(0.142)	(0.266)	(0.177)	(0.341)
USDhedge	0.0641	0.198**	0.0447	0.234***	0.126	0.105
	(0.0460)	(0.0790)	(0.0518)	(0.0817)	(0.0779)	(0.150)
EURhedge	0.219***	0.162***	0.210***	0.0806	0.302***	0.394***
	(0.0554)	(0.0625)	(0.0592)	(0.0622)	(0.0908)	(0.116)
Dollarpeg	1.944***	4.887***	2.168***	4.997***	1.719***	5.873***
	(0.224)	(0.250)	(0.257)	(0.272)	(0.482)	(0.569)
Euroarea	-0.307***	2.251***	-0.225**	2.299***	-0.374**	2.099***
	(0.0861)	(0.169)	(0.0883)	(0.192)	(0.152)	(0.227)
Coefvar2	-0.980***	-0.180	-1.155***	-0.537	-0.571*	0.687
	(0.179)	(0.318)	(0.183)	(0.492)	(0.334)	(0.551)
Constant	-2.596***	-5.677***	-2.514***	-5.589***	-2.907***	-6.252***
	(0.172)	(0.258)	(0.174)	(0.326)	(0.227)	(0.344)
Observations	7,736,634	7,736,634	5,733,982	5,733,982	2,002,652	2,002,652
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18134	18134	16950	16950	14322	14322
Convergence	1	1	1	1	1	1

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

Table 13: 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	0.395***	-0.311***	0.310***	-0.377***	0.480***	-0.355**
	(0.0506)	(0.0844)	(0.0577)	(0.137)	(0.0761)	(0.166)
Seller_barg	-1.013***	-1.152***	-1.132***	-1.015***	0.0218	-1.375***
	(0.161)	(0.251)	(0.178)	(0.283)	(0.209)	(0.505)
Walrascon	0.296***	0.360	0.240**	0.336	0.439***	0.423
	(0.0957)	(0.294)	(0.110)	(0.351)	(0.135)	(0.371)
Refcon	0.0583	0.627**	0.00352	0.591*	0.204	0.735**
	(0.0926)	(0.297)	(0.103)	(0.347)	(0.159)	(0.350)
Diversification	1.428***	0.284	1.452***	0.215	1.265***	0.715*
	(0.140)	(0.286)	(0.170)	(0.309)	(0.153)	(0.424)
USDhedge	0.198***	0.348***	0.178***	0.352**	0.298***	0.344***
	(0.0568)	(0.126)	(0.0647)	(0.144)	(0.0703)	(0.132)
EURhedge	0.226***	0.225***	0.225***	0.123	0.332***	0.565***
	(0.0662)	(0.0678)	(0.0742)	(0.0764)	(0.102)	(0.137)
Dollarpeg	2.108***	4.629***	2.270***	4.595***	2.093***	6.159***
	(0.226)	(0.270)	(0.259)	(0.308)	(0.390)	(0.601)
Euroarea	0.0319	2.174***	0.0587	2.137***	0.131	2.459***
	(0.0890)	(0.189)	(0.0986)	(0.222)	(0.140)	(0.254)
Coefvar2	-0.940***	-0.137	-1.214***	-0.783	-0.458	0.663
	(0.227)	(0.403)	(0.232)	(0.652)	(0.332)	(0.566)
Constant	-2.498***	-5.124***	-2.444***	-5.092***	-2.598***	-5.159***
	(0.106)	(0.374)	(0.119)	(0.451)	(0.161)	(0.431)
Observations	6,002,021	6,002,021	4,229,103	4,229,103	1,772,918	1,772,918
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	14515	14515	13442	13442	11486	11486
Convergence	1	1	1	1	1	1

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Note: Other controls included: USDhedge, EURhedge, Dollarpeg, Euroarea

Table 14: 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	0.339***	-0.585***	0.265***	-0.789***	0.445***	-0.189
	(0.0542)	(0.0968)	(0.0624)	(0.175)	(0.0934)	(0.157)
Seller_barg	-0.944***	-1.047***	-1.039***	-0.922***	-0.0237	-1.429*
	(0.178)	(0.274)	(0.195)	(0.286)	(0.235)	(0.758)
Walrascon	0.467***	1.013***	0.255*	0.846**	1.097***	1.645***
	(0.107)	(0.225)	(0.137)	(0.332)	(0.190)	(0.378)
Refcon	0.103	1.041***	-0.132	0.766**	0.878***	2.016***
	(0.108)	(0.227)	(0.133)	(0.321)	(0.212)	(0.339)
Diversification	1.896***	0.454	1.999***	0.431	1.663***	1.110***
	(0.163)	(0.305)	(0.188)	(0.347)	(0.239)	(0.409)
USDhedge	-0.0722	0.142*	-0.0886*	0.191**	0.0300	0.0427
	(0.0454)	(0.0831)	(0.0485)	(0.0804)	(0.0957)	(0.158)
EURhedge	0.152**	0.104*	0.160**	0.0947	0.228**	0.208
	(0.0603)	(0.0622)	(0.0649)	(0.0625)	(0.112)	(0.157)
Dollarpeg	1.854***	5.193***	1.977***	5.314***	2.620***	6.138***
	(0.281)	(0.338)	(0.330)	(0.380)	(0.525)	(0.620)
Euroarea	-0.155	2.237***	-0.0540	2.299***	-0.0920	2.228***
	(0.116)	(0.205)	(0.133)	(0.218)	(0.174)	(0.320)
Coefvar2	-0.0869	0.575	-0.0440	0.474	-0.0621	1.002*
	(0.141)	(0.371)	(0.179)	(0.544)	(0.225)	(0.595)
Constant	-2.715***	-5.745***	-2.551***	-5.592***	-3.211***	-6.434***
	(0.116)	(0.301)	(0.142)	(0.398)	(0.233)	(0.477)
Observations	4,438,374	4,438,374	3,235,932	3,235,932	1,202,442	1,202,442
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	11051	11051	10318	10318	8693	8693
Convergence	1	1	1	1	1	1

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Note: Other controls included: USDhedge, EURhedge, Dollarpeg, Euroarea

Table 15: Relative Risk Ratios reported for Table 5

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Walrascon	1.340***	2.480***	1.165***	2.210***	2.001***	3.240***
	(0.110)	(0.192)	(0.124)	(0.231)	(0.156)	(0.190)
Refcon	0.321***	2.090***	0.124	1.929***	1.149***	2.833***
	(0.106)	(0.184)	(0.115)	(0.207)	(0.155)	(0.247)
cust_barg_ag	-0.686***	-1.616***	-0.770***	-1.151***	-0.0391	-3.215***
	(0.128)	(0.248)	(0.143)	(0.240)	(0.221)	(0.535)
Importshare	0.265**	0.771***	0.232	0.575***	0.254*	0.661**
	(0.124)	(0.198)	(0.145)	(0.203)	(0.139)	(0.260)
USDhedge	0.200***	0.202**	0.210***	0.246***	0.171**	0.0871
	(0.0645)	(0.0974)	(0.0714)	(0.0942)	(0.0849)	(0.174)
EURhedge	0.181**	0.153**	0.158*	0.116*	0.364***	0.361***
	(0.0845)	(0.0658)	(0.0911)	(0.0636)	(0.112)	(0.139)
Euroarea	-0.179**	3.928***	-0.297***	3.715***	0.362***	4.688***
	(0.0855)	(0.137)	(0.0840)	(0.153)	(0.134)	(0.194)
Coefvar2	-2.695***	-0.763**	-2.898***	-0.884**	-2.344***	-0.370
	(0.258)	(0.313)	(0.272)	(0.414)	(0.458)	(0.420)
Constant	-1.473***	-6.612***	-1.396***	-6.408***	-1.664***	-7.034***
	(0.129)	(0.285)	(0.137)	(0.325)	(0.219)	(0.312)
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
Clusters	20992	20992	19618	19618	16786	16786
Convergence	1	1	1	1	1	1

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

Table 16: Relative Risk Ratios reported for Table 6 (firm-level considerations)

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	1.520***	0.716***	1.398***	0.651***	1.751***	0.835
	(0.0703)	(0.0578)	(0.0732)	(0.0849)	(0.131)	(0.114)
Seller_barg	0.388***	0.296***	0.342***	0.333***	1.128	0.287***
	(0.0489)	(0.0730)	(0.0466)	(0.0893)	(0.211)	(0.134)
Walrascon	1.320*	2.408***	1.106	2.127***	2.372***	4.255***
	(0.214)	(0.398)	(0.194)	(0.503)	(0.402)	(1.103)
Refcon	0.924	2.473***	0.769	2.077***	1.805***	5.586***
	(0.149)	(0.412)	(0.132)	(0.476)	(0.333)	(1.296)
Diversification	4.356***	1.549*	4.611***	1.534	3.657***	2.757***
	(0.529)	(0.372)	(0.647)	(0.412)	(0.632)	(0.930)
USDhedge	1.053	1.193**	1.037	1.231**	1.135	1.104
	(0.0468)	(0.0986)	(0.0512)	(0.101)	(0.0885)	(0.162)
EURhedge	1.217***	1.187***	1.213***	1.117*	1.355***	1.487***
	(0.0631)	(0.0712)	(0.0689)	(0.0709)	(0.124)	(0.177)
Dollarpeg	7.107***	125.4***	8.843***	137.4***	5.472***	362.3***
	(1.607)	(31.82)	(2.272)	(38.41)	(2.637)	(206.2)
Euroarea	0.718***	9.048***	0.792***	9.722***	0.686**	8.303***
	(0.0625)	(1.455)	(0.0710)	(1.817)	(0.103)	(1.903)
Coefvar2	0.356***	0.881	0.287***	0.586	0.565*	1.916
	(0.0702)	(0.294)	(0.0538)	(0.283)	(0.188)	(1.010)
Constant	0.0860***	0.00418***	0.0987***	0.00492***	0.0547***	0.00183***
	(0.0157)	(0.00102)	(0.0190)	(0.00154)	(0.0122)	(0.000619)
Observations	7,736,634	7,736,634	5,733,982	5,733,982	2,002,652	2,002,652
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18134	18134	16950	16950	14322	14322
Convergence	1	1	1	1	1	1

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

Table 17: Relative Risk Ratios reported for Table (join country and firm level test)

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	1.636***	0.802**	1.510***	0.744**	1.758***	0.752**
	(0.0790)	(0.0716)	(0.0821)	(0.0948)	(0.141)	(0.0962)
Seller_barg	0.281***	0.169***	0.216***	0.145***	1.124	0.362**
	(0.0437)	(0.0486)	(0.0331)	(0.0462)	(0.247)	(0.180)
Importshare	1.595***	2.084***	1.852***	2.703***	1.011	0.675*
	(0.160)	(0.413)	(0.171)	(0.499)	(0.128)	(0.153)
Walrascon	1.369**	2.680***	1.180	2.505***	2.370***	4.253***
	(0.214)	(0.449)	(0.196)	(0.595)	(0.403)	(1.100)
Refcon	0.917	2.354***	0.772	2.020***	1.796***	6.325***
	(0.144)	(0.383)	(0.126)	(0.463)	(0.337)	(1.502)
Diversification	4.259***	1.804***	4.566***	1.838**	3.638***	2.546***
	(0.536)	(0.410)	(0.647)	(0.489)	(0.643)	(0.869)
USDhedge	1.066	1.219**	1.046	1.264***	1.134	1.110
	(0.0491)	(0.0963)	(0.0542)	(0.103)	(0.0883)	(0.166)
EURhedge	1.245***	1.175***	1.233***	1.084	1.353***	1.483***
	(0.0690)	(0.0734)	(0.0730)	(0.0674)	(0.123)	(0.172)
Dollarpeg	6.984***	132.6***	8.745***	148.0***	5.579***	355.5***
	(1.566)	(33.17)	(2.244)	(40.27)	(2.688)	(202.1)
Euroarea	0.736***	9.495***	0.798**	9.967***	0.688**	8.159***
	(0.0634)	(1.600)	(0.0705)	(1.914)	(0.105)	(1.852)
Coefvar2	0.375***	0.835	0.315***	0.585	0.565*	1.987
	(0.0673)	(0.266)	(0.0577)	(0.287)	(0.189)	(1.095)
Constant	0.0746***	0.00342***	0.0810***	0.00374***	0.0546***	0.00193***
	(0.0128)	(0.000884)	(0.0141)	(0.00122)	(0.0124)	(0.000664)
Observations	7,736,634	7,736,634	5,733,982	5,733,982	2,002,652	2,002,652
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18134	18134	16950	16950	14322	14322
Convergence	1	1	1	1	1	1

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

Table 18: Results of the aggregated test for the big/small split at the median firm with 3 product-pairs

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Walrascon	1.351***	2.636***	1.295***	2.627***	2.088***	3.124***
	(0.110)	(0.198)	(0.113)	(0.208)	(0.196)	(0.256)
Refcon	0.331***	2.240***	0.263**	2.236***	1.517***	3.120***
	(0.106)	(0.191)	(0.108)	(0.199)	(0.215)	(0.348)
Cust_barg_ag	-0.688***	-2.129***	-0.686***	-2.065***	-0.512**	-3.224***
	(0.128)	(0.322)	(0.132)	(0.323)	(0.235)	(0.769)
Importshare	0.262**	0.725***	0.236*	0.811***	0.460***	-0.730**
	(0.124)	(0.213)	(0.128)	(0.217)	(0.175)	(0.334)
USDhedge	0.201***	0.232**	0.204***	0.228**	0.153	0.401**
	(0.0645)	(0.0985)	(0.0664)	(0.0973)	(0.123)	(0.190)
EURhedge	0.180**	0.153**	0.167*	0.120*	0.519***	0.686***
	(0.0846)	(0.0688)	(0.0867)	(0.0663)	(0.141)	(0.243)
Euroarea	-0.173**	3.909***	-0.192**	3.887***	0.367*	4.601***
	(0.0855)	(0.136)	(0.0852)	(0.143)	(0.209)	(0.297)
Dollarpeg	3.235***	8.027***	3.270***	8.057***	2.694***	9.073***
	(0.127)	(0.172)	(0.130)	(0.174)	(0.683)	(0.612)
Coefvar2	-2.716***	-1.488***	-2.914***	-1.413***	-1.389***	-0.785
	(0.257)	(0.494)	(0.244)	(0.527)	(0.480)	(0.610)
Constant	-1.483***	-6.730***	-1.438***	-6.750***	-1.921***	-7.380***
	(0.129)	(0.295)	(0.131)	(0.308)	(0.266)	(0.385)
Observations	8,614,721	8,614,721	8,179,202	8,179,202	435,519	435,519
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	20992	20992	20575	20575	11791	11791
Convergence	1	1	1	1	1	1

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

Table 19: Results of the firm-level test for the big/small split at the median firm with 3 product-pairs

	Full sample		Big		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	PCP	LCP	PCP	LCP	PCP	LCP
Cust_barg	0.419***	-0.334***	0.393***	-0.392***	0.553***	0.116
	(0.0463)	(0.0808)	(0.0485)	(0.0882)	(0.0736)	(0.165)
Seller_barg	-0.946***	-1.217***	-0.969***	-1.205***	0.0834	-1.799***
	(0.126)	(0.247)	(0.128)	(0.256)	(0.229)	(0.445)
Walrascon	0.278*	0.879***	0.233	0.878***	0.871***	1.218***
	(0.162)	(0.165)	(0.170)	(0.178)	(0.194)	(0.298)
Refcon	-0.0793	0.905***	-0.121	0.916***	0.504**	1.372***
	(0.161)	(0.167)	(0.168)	(0.179)	(0.229)	(0.283)
Diversification	1.472***	0.437*	1.496***	0.336	0.922***	1.423**
	(0.121)	(0.240)	(0.126)	(0.240)	(0.236)	(0.577)
USDhedge	0.0521	0.177**	0.0417	0.157*	0.195*	0.335***
	(0.0445)	(0.0826)	(0.0461)	(0.0821)	(0.106)	(0.127)
EURhedge	0.197***	0.171***	0.196***	0.141**	0.289***	0.348***
	(0.0518)	(0.0599)	(0.0537)	(0.0588)	(0.0977)	(0.133)
Dollarpeg	1.961***	4.832***	2.023***	4.907***	0.526	5.464***
	(0.226)	(0.254)	(0.230)	(0.257)	(1.094)	(1.129)
Euroarea	-0.331***	2.203***	-0.308***	2.236***	-0.289	2.071***
	(0.0870)	(0.161)	(0.0891)	(0.177)	(0.234)	(0.240)
Coefvar2	-1.032***	-0.127	-1.215***	-0.188	0.0850	-0.0220
	(0.197)	(0.334)	(0.166)	(0.375)	(0.360)	(0.698)
Constant	-2.454***	-5.478***	-2.422***	-5.418***	-2.746***	-6.805***
	(0.183)	(0.245)	(0.191)	(0.260)	(0.273)	(0.433)
Observations	7,736,634	7,736,634	7,339,359	7,339,359	397,275	397,275
Time FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clusters	18134	18134	17811	17811	9916	9916
Convergence	1	1	1	1	1	1

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