RUSSIA’S NON-COMMODITY EXPORTS: WHY THE MUTED RESPONSE TO THE RECENT DEVALUATION?  

A. Introduction and Summary

1. An often-cited silver lining of lower commodity prices is the ensuing real depreciation and potential to unwind the Dutch disease that commodity exporters experienced during the preceding commodity booms. While there is anecdotal evidence supporting the recovery of select tradable sectors in Russia, it has yet to manifest itself in a meaningful way in macro-level data. (Figure 1).

![Figure 1. Russia’s Exports Composition and Competitiveness](image)

2. A Selected Issue Paper accompanying the 2016 Russia Article IV staff report argued that structural weaknesses attenuated the economy’s ability to reallocate resources across sectors in response to relative price changes. The study drew in part on Culiuc and Kyobe (2017), who link lower REER export elasticities to structural weaknesses. As many of these weaknesses are present in Russia, the 2016 Article IV concluded that structural reforms in key areas should be conducive to a larger/faster response of the tradable sector to the recent depreciation. The present study argues the task may be more complicated when the adjustment in relative prices is driven by a negative terms of trade (ToT) shock. Two sets of factors are explored: (i) disruptiveness of sudden terms-of-trade driven devaluations and (ii) issues related to external demand and access to external markets.

3. First, sudden depreciations like those triggered by an export commodity price drop put the economy under stress, and may not be conducive to a large reallocation of resources across sectors.

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1 Prepared by Alexander Culiuc.
Section B confirms this empirically, and links the finding to the uncertainty associated with the REER correction, the irreversibility of the Dutch disease, and the stress of the banking sector.

4. Sections C and D document the impact of global demand and market access on the Russia’s ability to take advantage of the recently improved price competitiveness. It is well established that episodes of commodity busts—especially for oil—are generally associated with (and driven by) a softer global demand, and this relationship normally blunts the effect of improved competitiveness of non-commodity exporters in commodity-dependent economies. However, the most recent oil price collapse was primarily driven by supply factors, which means that global demand was not the culprit and remained reasonably strong in the last two years. But, Russia’s main trading partners economies (CIS) performed relatively poorly, where Russia has a high concentration of non-commodity exports.

5. Section E briefly considers the structural transformation to date achieved by Russian exporters. Results are mixed: generally positive long-term trends in diversification have stalled and have not been accompanied to a move into more sophisticated products.

6. Section F concludes with a set of policy recommendations pertaining to (i) efforts to insulate the non-commodity sector from oil price volatility, (ii) structural reforms to support reallocation of resources across sectors, (iii) initiatives to improve penetration of global markets, and (iv) measures to ensure that the financial system can support reallocation of resources even during periods of stress.

B. Export Elasticities During Terms-of-Trade Driven Depreciations

7. The argument that a reduction in commodity prices will unwind the Dutch disease assumes symmetry: since increasing commodity prices drove resources out of the non-commodity tradable sector (via an appreciated real exchange rate), decreasing commodity prices and ensuing real depreciation should bring resources back into the non-tradable sector. Effectively, this implies that the magnitude of the elasticity of non-commodity exports to the real effective exchange rate (REER) is equal regardless of the direction of the REER movement, and is not affected by the phase of the commodity cycle. We test whether this symmetry holds in the data, by estimating this elasticity separately for periods of rising and falling commodity prices.

8. Elasticities of exports with respect to the REER and trading partner growth are estimated using a standard panel regression setup:

\[
\Delta \log X_{it} = \beta_1 \Delta \log \text{PartnerGDP}_{it} + \beta_2 \Delta \log \text{REER}_{it-1} + \omega_i + \eta_t + \varepsilon_{it} \tag{1}
\]

where \(X\) is manufacturing exports (data from World Bank’s World Development Indicators), \(\omega\) is a country dummy and \(\eta\) is a time dummy. \(\beta_1\) and \(\beta_2\) represent, respectively, the estimated export elasticities with respect to export trading partners GDP growth and REER. The analysis uses data averaged over three year periods, which means that estimates are best interpreted as medium-term.

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2 See, for example, Eichengreen and Gupta (2013).
elasticiies. The REER is lagged one period to alleviate endogeneity concerns.\(^3\) This baseline setup is augmented with the export commodity price index (ECPI) data from the Gruss (2014) as follows.\(^4\)

\[
\Delta \log X_{it} = \beta_0 \Delta \log \text{PartnerGDP}_{it} + \beta_1 \Delta \log \text{REER}_{it-1} \times \text{ECPI}_{up} + \\
+ \beta_1 \Delta \log \text{REER}_{it-1} \times \text{ECPI}_{down} + \omega_i + \eta_t + \epsilon_{it} \tag{2}
\]

\(\text{ECPI}_{down}\) and \(\text{ECPI}_{up}\) are dummy variables indicating the direction in which the ECPI is changing. Interacting these dummies with the \(\Delta \log \text{REER}_{it-1}\) allows to estimate the elasticity of manufactured exports w.r.t. REER separately for periods of ECPI rises and falls.\(^5\)

### Table 1. Panel Estimations of Elasticities of Manufactured Exports with Respect to the REER

<table>
<thead>
<tr>
<th></th>
<th>Non-LICs</th>
<th>Commodity exporters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Trading partner growth</td>
<td>2.726***</td>
<td>2.729***</td>
</tr>
<tr>
<td></td>
<td>(0.963)</td>
<td>(0.969)</td>
</tr>
<tr>
<td>Lagged (\Delta \ln \text{REER})</td>
<td>-0.191***</td>
<td>-0.545**</td>
</tr>
<tr>
<td></td>
<td>(0.0653)</td>
<td>(0.204)</td>
</tr>
<tr>
<td>Lagged (\Delta \ln \text{REER}) ((\Delta \text{ECPI}&lt;0%))</td>
<td>-0.182</td>
<td>-0.387</td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td>(0.273)</td>
</tr>
<tr>
<td>Lagged (\Delta \ln \text{REER}) ((\Delta \text{ECPI}&gt;0%))</td>
<td>-0.196**</td>
<td>-0.581**</td>
</tr>
<tr>
<td></td>
<td>(0.0851)</td>
<td>(0.232)</td>
</tr>
<tr>
<td>Lagged (\Delta \ln \text{REER}) ((\Delta \text{ECPI}&lt;-2.5%)</td>
<td>-0.0702</td>
<td>-0.276</td>
</tr>
<tr>
<td></td>
<td>(0.185)</td>
<td>(0.354)</td>
</tr>
<tr>
<td>Lagged (\Delta \ln \text{REER}) ((\Delta \text{ECPI}&gt;2.5%))</td>
<td>-0.214***</td>
<td>-0.627**</td>
</tr>
<tr>
<td></td>
<td>(0.0757)</td>
<td>(0.241)</td>
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<tr>
<td>Country fixed effects</td>
<td>YES</td>
<td>YES</td>
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<td>Time fixed effects</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>(R^2)</td>
<td>0.332</td>
<td>0.332</td>
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<tr>
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<td>628</td>
<td>628</td>
</tr>
<tr>
<td>Countries</td>
<td>61</td>
<td>61</td>
</tr>
</tbody>
</table>

Note: Dependent variable is the first difference in log manufactured exports. Standard errors in parentheses are clustered by country. *** \(p<0.01\), ** \(p<0.05\), * \(p<0.1\).

9. Results are presented in Table 1 and summarized in Figure 2. Baseline results in column 1 for a set of 61 advanced and emerging markets (both net exporters and importers of commodities) are

\(^3\) The focus on manufacturing exports alone also reduce concerns about reverse causality as manufacturing exports represent relatively small shares of total current account flows, especially in commodity-exporting countries.

\(^4\) The dataset offers country-specific price indices of commodities.

\(^5\) Note that the dummy is not introduced separately on the right-hand side, and neither is the level or change in the ECPI. While manufactured exports are affected by export commodity prices, we are only interested in measuring its impact as revealed via the elasticity, which is the standard measure for assessing the response to a price competitiveness improvement.
as expected: REER elasticity is negative and external demand elasticity is positive, both significant at the 1 percent level. Column 2 estimates the elasticity w.r.t. REER separately for periods of rising and falling export commodity prices, and in column 3 the focus is on periods when annualized swings in ECPI exceeding 2.5 percent (which corresponds to the 90th percentile in the three-year change in ECPI). The findings indicate that the elasticity of manufacturing exports w.r.t. REER is close to zero when the country is emerging from a period of falling prices for its commodity exports. Columns 4 through 6 repeat the exercise restricting the sample to commodity exporting countries. The differences between periods of commodity price upswings and downswings become even more dramatic here: the elasticity is nearly twice as large when commodity prices are on the rise than when they are on the decline (and the latter elasticity is not statistically significant from zero).

The literature provides several potential explanations for this asymmetric elasticity, which is particularly pronounced in the case of commodity exporters.

10. Krugman (1987) discussed asymmetric response of non-commodity exports to movements in the REER in the presence of learning by doing externalities in the tradable sector. During commodity booms, the marginal tradable industries are driven out of the market. As this happens, foreign competitors gain an advantage on the back of learning-by-doing externalities. Even if the real exchange rate reverses back to the original level, the domestic manufacturers of tradable products lost during the over-appreciation period can no longer compete.

11. Krugman (1989) formalized the concept of hysteresis (i.e., a more prolonged J-curve) of exports to large and volatile REER movement attributable to the sunk cost of exporting. He argues that the uncertainty about the future exchange rate leads to delaying the decision to incur fixed costs associated with exporting. Krugman’s original argument dealt with REER uncertainty associated with volatile capital flows in the context of the US in the 1980s. However, the argument is

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6 Commodity exports represent over 20 percent of all export or over 10 percent of GDP.
easily extendable to uncertainty related to commodity prices, which is the main driver of Russia’s exchange rate. Indeed, in light of the recent rebound of Russia’s exchange rate, the 2015–16 depreciation might be viewed by investors as a temporary overshooting.

12. Finally, deep linkages between the commodity and non-commodity sectors can prevent the non-commodity tradable sector from taking advance of the depreciation caused by a commodity price shock because such a depreciation puts under stress the entire economy. The financial sector is the most obvious transmission mechanism. During the commodity boom, the financial system of a commodity exporter becomes concentrated on the commodity sector and on the non-tradable sector (e.g., construction, retail) that prosper during periods of appreciated currency. As the commodity and non-tradable sectors turn sour, the balance sheets of financial institutions come under stress. Fiscal adjustment in the face of the shock can also increase NPLs of companies dependent on public contracts (Alesina et al. 2008). Figure 3 provides some stylized evidence from the most recent oil shock. While few of the 20 largest EMs showed an increase in NPLs of the scale experienced by Russian banks, a few countries with equally large oil-to-exports ratios have shown a similar deterioration in asset quality.7

13. In short, lending becomes restricted and expensive at the very moment when non-commodity tradable industries need to invest in order to take advantage of the depreciated real exchange rate. While established manufacturers may be able to finance expansions internally

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7 There may be some bias in the data. Russia and India were both involved in large scale cleanups of their banking system, so the increase also reflects more stringent supervision. In some oil-rich countries, the deterioration of bank assets may be partially obscured by loan restructurings (evergreening).
(especially as they see profits rise on the back of improved price competitiveness), tight credit may prevent entry into the sector.

14. Recent empirical studies support the commodity-banking channel. Kinda et al. (2016) show that negative shocks to commodity prices tend to weaken the financial sectors of commodity exporting emerging and developing markets, with larger shocks having more pronounced impacts. More specifically, negative commodity price shocks are associated with higher non-performing loans, bank costs and banking crises, while they reduce bank profits, liquidity, and provisions to nonperforming loans. A bank-level analysis of 46 commodity-dependent LICs by Agarwal et al. (2016) shows a reduction of commodity prices reduces bank lending by domestic bank in commodity-dependent countries on the back of deteriorated bank capitalization.

C. Trading Partner Growth

15. Changes in commodity prices don’t happen in a vacuum. An important driver is global demand; the same global demand that drives non-commodity exports directly. Figure 4 shows that this correlation is significant at the country level—trading partner growth is positively and statistically significantly correlated with the export commodity price index for a group of 29 commodity-exporting countries.

16. The recent drop in oil prices has been linked primarily to supply factors, suggesting that depressed demand should not have prevented countries from taking advantage of improved price competitiveness. Indeed, there is little correlation between trading partner growth and commodity prices when focusing on the 2014–16 period (the 2014–16 regression line in virtually flat in Figure 4)—trading partner growth stayed roughly at the level of long-time averages.

17. However, Russia’s experience in the latest oil price decline did not fit the same pattern, as its trading partner have performed significantly worse than those of the average commodity exporter (Figure 4 shows Russia’s data points for 2014–16 lie some 1–1½ percentage point below the
corresponding regression line). In fact, Russia’s trading partners performed roughly in line with what the longer-term correlation would suggest. The low growth of Russia’s export markets is also apparent when comparing it to trading partners of other major EMs (Figure 5, left panel). Russia is at the bottom of the distribution along with a few European EMs, despite being much less dependent on EU’s slowly-recovering economy. It is therefore not surprising that Russia’s manufacturing exports performed relatively poorly in the same timeframe, as shown in the right panel of Figure 5.\(^8\) It is notable that all EM commodity exporters are well below the regression line, which provides further support to the main result in section B—non-commodity tradable industries of commodity exporters generally face an uphill battle during periods of commodity price collapses, even when controlling for trading partner growth.

**Figure 5. Trading Partner Growth and Manufacturing Exports in Large EMs**

Sources: Author’s calculations using data from IMF DOTS, WEO and Gruss (2014).
Note: Left chart shows export-weighted real GDP growth of each country’s export trading partners. Right chart weights trading partners by their share in the exports of manufactured goods on the horizontal axis (see Annex 1). The vertical axis presents annualized growth of manufactured exports deflated by the US CPI.

18. Russia’s low trading partner growth relates in part to the geographical distribution of its exports, which are highly concentrated on its neighbors. While CIS markets account for just over \(\frac{1}{2}\) percent of global GDP, they absorbed 12 percent of Russia exports in 2013 (on the eve of the crisis), and some 28 percent of manufacturing exports. Growth in these countries is strongly correlated with that of Russia, either because the countries are also commodity exporters, or because they are themselves highly dependent on exports to or remittances from Russia. It is therefore not surprising that Russia’s manufactured exports registered particularly large drops on CIS markets (left chart in figure 6).\(^9\) The strong dependence on neighboring markets explains a longer-term peculiarity of

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\(^8\) Here and below manufactured exports are defined in accordance with Annex 1.

\(^9\) Excluding from the analysis exports to Ukraine, to which exports decreased due to geopolitical tensions, does not change the overall results: manufactured exports to other CIS members has decreased by over 30 percent, more than twice the drop registered on non-CIS markets.
Russia's macroeconomic performance—its growth is much more correlated with that of its export partners than its trade openness would suggest (right chart in figure 6).

![Figure 6. Consequences of Russia’s Dependence on Neighbouring Markets](image)

Source: Author’s calculations using data from COMTRADE.
Note: Exports are deflated by US CPI.

### D. Market Access

19. One reason for Russia’s excessive concentration of exports on neighboring markets is the fact that Russia has no free trade agreements beyond them. This section investigates whether limited preferential market access—especially when compared to other major emerging markets—may be an additional impediment dampening the non-commodity export industries’ response to the real depreciation.

20. The private sector and commentators have mentioned limited preferential access to global goods as a drag on export potential. Comparisons to other EMs are often brought into the discussion. For example, Mexico’s car manufacturing industry benefited greatly from tariff-free access to its northern neighbors thanks to NAFTA and a free trade agreement with the EU. Russia’s tariff-free trade is restricted to the much smaller markets of the Eurasian Economic Union (EAEU). This makes Russia a poor choice for setting up export-oriented operations, as higher tariff and non-tariff barriers faced for final exports puts Russian-based operations at a disadvantage. On top of that, import trade restrictions raise costs of firms operating global value chains, most of which extend well beyond Russia’s immediate neighborhood.

21. Russia currently has regional trade agreements (RTAs) only with other EAEU members and Serbia.¹⁰ The EAEU has de facto replaced 2011 CIS Free Trade Agreement, which Russia has terminated in 2016.¹¹ Back in the early nineties, most emerging markets were in a similar situation:

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¹⁰ The Eurasian Economic Union (EAEU) includes Armenia, Belarus, Kazakhstan, Kyrgyz Republic and the Russian Federation. It provides for free movement of goods, services, capital and labor, as well as coordinated, agreed or common policy in different areas. The bilateral agreement with Serbia applies to select goods only.

¹¹ The 1994 CIS free trade agreement was never ratified by Russia.
according to the WTO database, none of the large EMs had RTAs with countries representing more than 1 percent of global GDP. The situation has changed dramatically since the mid-nineties with the establishment and enlargement of major regional agreements (NAFTA, APEC, EU).

22. Figure 7 below shows the explosive growth in the participation on most large EMs in regional trading agreements, with several comparator countries participating in RTAs comprising over half of the global GDP. Russia is a rare exception, with virtually no preferential access to major markets, and no meaningful change over nearly three decades. It could be argued that Russia’s large domestic market affords the country to have fewer RTAs. Indeed, large countries generally have less expansive RTA networks (figure 7, right chart). However, Russia is an outlier even by the standards of large economies, as it is last among the twenty top economies on this metric. Carrying through ongoing efforts to establish bilateral agreements (e.g., with India and Vietnam), as well as plans for other RTAs included in announced development strategies could support Russian exporters, as well multinationals contemplating including Russia into their global value chains.

23. Nevertheless, it should be noted that on its existing markets, Russian exporters face relatively low trade barriers. Building on the seminal work of Anderson and Neary\textsuperscript{12}, Kee et al. (2009) construct MA-OTRI (Market Access Overall Trade Restrictiveness Index)—an index of trade restrictions faced by exporters on their markets. Importantly, it covers both tariff and non-tariff trade barriers. Figure 8 shows that Russia in fact faces relatively low tariff and overall trade restrictions on their external markets. However, the index appears to suffer from selection bias, as it is affected by the markets to which countries export and basket of goods it exports, which are endogenous variables, driven in part by trade barriers. For example, the estimated low barriers faced by Russian manufacturers may be due in part to relatively high share of manufactured exports to EUEA discussed above.

\textsuperscript{12} Their work on the subject starts in 1992; a comprehensive overview can be found in Anderson and Neary (2005).
E. Quantifying Structural Transformation

24. Sections B and C analyzed aggregate performance of exports in the wake of a ToT shock. This section provides a brief overview of the changing structure of Russia’s exports using two analytical tools that operate with disaggregated trade data: export growth decomposition and export sophistication evaluation using the EXPY index.

25. Export growth decomposition computes the contribution of the extensive and intensive margins of growth in real exports (denominated in U.S. CPI-deflated US$). The intensive margin refers to exporting more of the old products to old markets (destinations). The extensive margin refers to growth associate with exporting new products and/or exporting to new destinations. The methodology, based on Zahler (2007), and detailed results are covered in Annex 2.

26. Over the medium term, Russia’s manufacturing exports grew in a balanced way (Figure 9). New products contributed to 14 percent of total exports growth, which places Russia in the top quintile of analyzed countries. Despite its market access handicap, Russia also managed to grow its exports considerably by introducing its products to new markets. However, the period associated with falling oil prices (right chart in figure 9), shows that commodity price-driven ToT shocks are not conducive to a structural change in the export basket: neither Russia, nor other commodity exporters managed to introduce new products, and few have made significant gains on external markets.

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13 Comparator group includes most large EMs, as well as five advanced economies as benchmarks: two large exporters (Germany and Korea), two hi-tech small open economies (Ireland and Israel) and one commodity exporter (Australia).

14 The results for Kazakhstan are explained in part by the low base; manufactured exports account for less than a quarter of the country’s exports.
Sophistication of exports can be measured using the EXPY index, introduced by Hausmann et al. (2007). It is a useful tool for tracking structural transformation of tradables and a good predictor of future growth. The index is based on the observation that rich and poor countries export different goods (e.g., nuclear reactors vs. cotton). A country that manages to export a basket of products that is characteristic for a richer country can be regarded as having achieved relatively high level of sophistication. The index is constructed in two stages. First, an intermediate index PRODY is computed for each product as the weighted average of per-capita GDPs, where the weights correspond to the revealed comparative advantage of each country in the particular good. EXPY for a country is then computed as the weighted average of the PRODY for that country, where the weights are simply the value shares of the products in the country’s total exports. Figure 10 shows that Russia’s EXPY has decreased significantly between 2001 and 2015, along with that of most other commodity exporters.
28. However, one issue with EXPY and related indices is that weights are based on dollar amounts, and hence terms of trade shocks change the EXPY even if volumes remain constant. Therefore, evaluating evolution of the overall EXPY during periods of rising/falling commodity prices automatically result in the mechanical decrease/increase of the index (as oil and most other commodities have low PRODYs). Results in figure 10—which places most commodity exporters in the bottom half of the range—could therefore be driven by the increase in the share of commodities on the back of rising real commodity prices between 2001 and 2015. To get around this issue, Figure 11 presents EXPY recomputed for manufactured exports only. The overall picture remains unchanged: Russia, along with most commodity exporters, has registered a negative evolution in the sophistication of the manufactured exports basket. In other words, in line with Krugman (1987), structural transformation in commodity-exporting countries is an uphill battle.

![Figure 11. EXPY for Manufactured Goods: Levels and Changes for Large Ems](image)

Source: Author’s calculations based on data from COMTRADE, IMF WEO and Hausmann, Hwang, Rodrik 2007).

F. Outlook and Policy Implications

29. This work qualifies the results and conclusions of last year’s SIP. Structural reforms will facilitate resource reallocation to other sectors in response to a negative REER shock. However, when the REER shock is the result of an unfavorable commodity price shock, several factors further blunt the competitiveness effect:

- The stress the economy is under due to worsened ToT impedes reallocation of resources to the non-commodity tradable sector; uncertainty and banking sector weaknesses are two channels.

- Episodes of ToT-driven depreciation usually coincide with reduced trading partner growth, which reduces demand for non-commodity exports.

- Low trading partner growth reduces incentives for experimenting with the introduction of new products, which limits opportunities for large structural transformation.

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15 Computing EXPY for a subset of the basket is more straightforward than undertaking a similar exercise for the more recent Index of Economic Complexity, introduced by Hausmann and Hidalgo (2009). This in part explains the reliance on EXPY in this section.
30. These results paint a somewhat subdued picture: the non-commodity tradable sector suffers from an overvalued exchange rate during commodity booms, but busts are not conducive to a rapid reversal of the process. The policy recommendations are therefore for Russia to compensate for this handicap by doing even more on the structural front:

- Attenuate the effects of commodity price effects on the non-commodity sector through highly counter-cyclical fiscal policy – the new mechanism introduced by the Ministry of Finance is a welcome step in this direction.

- Ensure that product and labor market regulations are conducive to reallocating resources in response to price signals (2016 Article IV Selected Issues Paper). This may need to be accompanied by the strengthening of the social safety net.

- Strengthen regional and multilateral trade relations to allow for greater penetration of foreign markets by Russian entities and to facilitate Russia’s integration into global value chains.

- Ensure financial system is healthy enough to shift credit to new sectors even during periods of external stress.
Annex I. Defining Manufactured Exports

The analysis uses disaggregated trade data from COMTRADE, with goods classified according to the 1996 version of the Harmonized System (HS). There is no single “correct” way to extract manufactured exports only from HS data, in part because what constitutes a manufactured good is subject to interpretation (how much processing should a raw material be subject to before it becomes a manufactured product?). However, classifications of economics activities—ISIC (UN), NAICS (NAFTA countries) and NACE (Eurostat)—do separate manufacturing. Matching one of these classifications (all of them compatible among each other, at least at the 2-digit level) with HS 1996 codes would allow to isolate manufactured exports in a consistent and replicable way for all countries used in the analysis.

We rely on Pierce and Schott (2009), who provide a concordance table between HS 1996 and NAICS 2007 codes. In the first step, HS codes corresponding to NAICS codes 31 through 33 are labeled as manufactured goods. This eliminates most raw materials within broad HS categories (e.g., excludes raw furs, but not leather products; excludes wood logs, but not sawn wood). In the second step, we eliminate two broad sets of HS codes (even if they are classified as manufacturing under NAICS): agricultural products, including processed foods (HS 2-digit codes 01 through 24), and mineral commodities and their derivatives (codes 25 through 28).

While the elimination of mineral products is self-explanatory, the blanket elimination of all agricultural and food products deserves an explanation. One of the objectives of the study is to understand the impact of price competitiveness on non-commodity imports. However, when it comes to agricultural products and processed food, export performance is subject to factors that are outside the scope of this study. Two of them are universal: weather (affects the harvest) and global prices for agricultural commodities. The third one is unique to Russia: counter-sanctions—introduced soon after the devaluation—have predominantly affected processed foods, and have been quoted as an important contributor to flourishing import substitution in respective sectors. To the extent that import substitution spills over into exports (e.g., thanks to learning-by-doing externalities accumulated on the domestic market), it is difficult to separate the exports response to price devaluation from that to counter-sanctions.

The figure shows the broad evolution (in constant US$ terms) of Russia’s exports separated into two main categories: manufacturing vs. the rest.
Annex II. Export Growth Decomposition: Methodology and Extended Results

An export growth decomposition analyzes export growth along the intensive and extensive margins, where the intensive margin reflects growth due to exporting “more of the same”, while the extensive margin has both a product and market dimension (exporting new products and exporting to new destinations).16

Stylized Example

The methodology is best illustrated with the following stylized example (see Figure). The full set of possible product-destination (PD) combinations can be visualized as a matrix with some 200 columns (countries) and some 5000 rows (products in the Harmonized System).

Suppose a country filled in 2001 only 7 cells of this product-country matrix, by exporting 4 products (P1 through P4) to 3 countries (A through C). The numbers within cells represent the value of exports of each product-destination (PD) combination, which sum up to 26. Note that only P1 is exported to all three countries. The 3-by-4 PD subset in which all exports are located is called the

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16 Based on Zahler (2007) methodology.
potential PD space (outlined with bold line), and defines quadrant I. Assume exports doubled to 52 in value by 2015. Forty two percent of this growth was on account of old goods to old destinations (surviving PD). Filling cells within the old potential PD space (P4 to C) accounts for 12 percent of growth. Sending old goods to new destinations (quadrant II) accounts for 19 percent of growth; new goods to old destinations (quadrant III) account for 31 percent of growth; and new products to new destinations (quadrant IV) account for 4 percent. Finally, the death of old PD combinations (P3 no longer exported to B) has a negative contribution of 8 percent.

**Interpretation of Results**

The sum of surviving PDs and extinct PDs represents the intensive margin of export growth, whereas the rest are part of the extensive margin of growth (along the product and destination dimensions). The relative importance of these five margins (surviving PDs, new PD in the old space, new P old D, new D old P, new P and D, extinct PDs) can shed light on the degree of experimentation that a country’s exporting sectors are involved with, and therefore their ability to capture new business and, more generally, successfully engage in a structural transformation of the economy.

The exercise can only be undertaken between two points in time. Naturally, the shorter the interval between the two extremes, the larger is the contribution of surviving PDs (intensive margin), as only a very small number of products is introduced each year, and only a few new markets are captured. Over longer periods of time, extensive growth will play a more prominent role (because it incorporates all the new PDs added in all intervening years, and growth registered by each new PD in the interim).

**Detailed Results**

Figure 2 presents full decompositions for Russia, focusing on different periods (e.g., pre-GFC boom vs. the post GFC), and different basis of the analysis (all exports vs. manufacturing exports only). The charts in panel figure 3 compare Russia to other large EMs and a small sample of advanced economies.
Figure 2. Export Growth Decomposition for Russia

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Exports</th>
<th>Manufacturing Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001/15</td>
<td>Surviving PD</td>
<td>New P, old D</td>
</tr>
<tr>
<td>2001/08</td>
<td>New P, new D</td>
<td>Old P, new D</td>
</tr>
<tr>
<td>2008/15</td>
<td>Dead PD</td>
<td>Total growth</td>
</tr>
</tbody>
</table>

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Figure 3. Export Growth Decomposition for Select Countries

### All Exports, 2001/15
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth

### Manufacturing Exports, 2001/15
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth

### All Exports, 2001/08
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth

### Manufacturing Exports, 2001/08
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth

### All Exports, 2008/15
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth

### Manufacturing Exports, 2008/15
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth

### Manufacturing Export, 2001/03
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth

### Manufacturing Exports, 2013/15
- New P, new D
- New P, old D
- Old P, new D
- New PD, old space
- Surviving PD
- Dead PD
- Total growth
References


