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Quantifying the impact of the latest U.S. tariff sanctions on Russia – a sectoral analysis

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Abstract

Following the recent G7 Summit in Germany, the United States announced a new sanction package that imposes significantly higher tariffs on products from Russia. These tariff increases concern 570 groups of products affecting more than $2 billion in imports from Russia. The declared objective of these tariff increases is to impose steep economic costs on Russia, while minimizing costs to U.S. consumers. The United States is also considering disbursement of revenues collected from these new tariffs to Ukraine.

Using a sector-specific partial-equilibrium model and the most reliable data available, this paper quantifies the welfare impact that the U.S. tariff increases will have on the Russian and the U.S. economies, respectively. We find that the new U.S. tariff sanctions will affect $2.6 billion of U.S. imports from Russia (or 8.7% of total U.S. imports from Russia). Moreover, these new tariff measures may decrease Russian welfare by $181 million per year, while imposing annual costs of $90 million on U.S. consumers. The United States can hope to collect $241 million per year in tariff revenues that may then be used to financially support Ukraine.

Our sectoral analysis shows that the U.S.' choice of target sectors produces mixed results. On one hand, the sanctions cover dozens of sectors whose inclusion produce particularly large welfare losses to Russia and/or high welfare gains to the United States. Yet, the sanctions package also raises serious questions about its effectiveness for other sectors. For example, higher tariffs for several selected sectors result in zero harm to Russia, and/or greater harm to the United States than to Russia. These and other insights may provide guidance for the design of future tariff sanctions by G7 Members and other Allies.

Key words

International trade; Russia; economic sanctions; import tariffs; economic impact; partial equilibrium; sectoral analysis; welfare analysis; pass-through

Disclaimer

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1. Introduction

During the recent G7 Summit in Germany, the seven largest democracies proclaimed plans to further intensify economic sanctions on Russia, and to do so in a coordinated fashion. In addition to pledges to cut off Russian military production and supply chains from Western technologies and other inputs, to reduce G7 dependency on Russian energy products and gold, to crack down on sanction evasion and backfill activities by Russia,[1] and to add hundreds of Russian individuals and companies to existing sanctioned-entity lists, the G7 leaders agreed to "coordinate" and "align" actions on increasing import tariffs on certain imports from Russia.[2,3]

While other G7 countries have yet to detail how they will implement their commitment to increase tariffs, the United States was quickest out of the gate and announced plans to significantly increase tariff rates on hundreds of Russian products as part of its latest sanctions package. Presidential Proclamation 10420 of June 27, 2022 imposed an across-the-board import tariff of 35% *ad valorem* on 570 product groups of imports from Russia effective as of July 27, 2022.[4] According to the Biden Administration, the objective pursued by these tariff increases is to impose economic harm on Russia "while minimizing costs to U.S. consumers". Moreover, President Biden has expressed his desire to seek authority from Congress to use revenues collected by new tariffs on Russian goods to financially support Ukraine, thus ensuring that "Russia pays for the costs of its war".[5]

Other than stating that this latest round of tariff increases is "carefully calibrated to impose costs on Russia" and will affect "Russian products worth approximately $2.3 billion to Russia", the United States has revealed little about either the scale of economic harm that it expects to impose on Russia, or the economic costs that sanctioning Russia will inflict on the U.S. economy itself. Moreover, the U.S. Administration has not explained for which of the 570 targeted Russian product groups it expects its tariff increases to be particularly effective and why.

This paper sets out to evaluate those questions. Using a novel sector-by-sector partial-equilibrium (PE) framework, we first estimate the overall economic impact that the announced

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[1] "Backfilling" is the activity in which Russia obtains components it needs for its war effort and economy from non-sanctioning countries (*e.g.*, China). "Sanction evasion" includes re-exports to Russia through non-sanctioning third countries.

[2] The G7 Statement on Support for Ukraine reads in pertinent parts:

> We remain steadfast in our commitment to our unprecedented coordinated sanctions measures in response to Russia's war of aggression, the impacts of which will compound over time. We are committed to sustaining and intensifying international economic and political pressure on President Putin's regime …, depriving Russia of the economic means to persist in its war of aggression against Ukraine, and we will continue our targeted use of coordinated sanctions for as long as necessary, acting in unison at every stage … In order to further intensify our economic measures against Russia, we collectively commit to taking the following measures in the days and weeks ahead … We will continue to coordinate on tariff measures on imports from Russia and explore possible pathways … to use the revenues to assist Ukraine where applicable (underlining added).

[3] This sanction package proposed by the G7 is of course only the latest in a growing list of economic sanctions imposed on Russia by a coalition of over 40 countries in response to its aggressive war on Ukraine. For an up-to-date overview of Russia-related sanctions, *see*, *e.g.*, the resources maintained by Sidley Austin LLP.

[4] Procedurally, the way for Presidential action on import tariffs was paved in April of 2022, when the U.S. Congress passed a bill to suspend "normal trade relations" with Russia and Belarus, thus revoking most-favored-nation status of the two countries. In turn, this allowed the U.S. President to increase import tariffs vis-à-vis Russia at the Administration's discretion.

[5] *See also* Statement by Ambassador Katherine Tai on New G7 Sanctions Commitments.

import tariff increases on the selected 570 product groups[6] will have on the welfare of the Russian and the U.S. economies. We also quantify the total tariff revenue that the United States can collect for potential disbursement as financial aid to Ukraine. Assuming that other G7 members and further sanctioning countries ("Allies") will follow the United States' lead and impose similar tariff measures on the same groups of products, we also quantify the welfare impact that such coordinated action would have on the Russian and Allied economies.[7] Specifically, we quantify the welfare impact of such "mirror sanctions" taken by Germany, France, and the entire European Union (EU). Next, going through the U.S. sanctions list line-item by line-item, we evaluate – from a purely economic perspective – the intended and unintended consequences of including certain sectors in the overall sanctions package.

While various recent contributions have applied PE frameworks to evaluate (actual or potential) sanctions on Russia, and the sanction instrument of import tariffs in particular (Gros 2022a, Gros 2022b, Larch et al. 2022, Sturm and Menzel 2022, Sturm 2022a, Sturm 2022b), we are not aware of any paper that disaggregates specific sanction packages on the sectoral level and quantifies their economic effects on a sector-by-sector level. Most papers published so far discuss single products, mostly from the energy (oil, gas, coal), agriculture (wheat), or mining sectors. We believe that this paper can make a contribution to the policy discussion of Russia sanctions given this gap in the literature and given the timeliness of the issue (as mentioned, the new U.S. tariff sanctions went into effect on 27 July, 2002 and other Allies may be in the process of preparing their next sanction packages).

2. Methodology of the model and its application to the latest US tariff sanctions

In this section, we briefly summarize the methodology of the model we apply (Section 2.1), and its concrete application to the policy issue of interest (*i.e.*, the economic effects of the latest round of U.S. tariff sanctions), including data used and metrics chosen (Section 2.2)

2.1 Summary of the model framework

We apply a proprietary model and software designed by the Economic Analysis Unit of Sidley Austin LLP, a leading law firm in the field of international trade and economic sanctions. The tool consists of a series of bilateral PE models between exporters (*e.g.*, Russia, Belarus) and (groups of) importers (*e.g.*, United States, EU, entirety of the Allied coalition[8]). The model is operationalized on the sectoral level, either on the four- or six-digit aggregation level of the Harmonized System (HS). Thus, depending on the level of granularity chosen, the model covers approximately 1,200 individual product groups (on the HS-4 level) or 5,300 (on the HS-6 level).

[6] In this paper, we will use the terms "product group" and "sector" interchangeably.

[7] Given the rhetoric of "alignment", "acting in unison at every stage", and "unprecedented coordination on sanctions" pervading the G7 Summit (*see* G7 Statement on Support for Ukraine, quoted in part in footnote 2, and G7 Leaders' Communiqué), it appears likely that other countries may follow the United States' lead and soon impose steep tariff increases on the same (or a similar) bundle of Russian import products.

[8] We define the group of Allies as consisting of US, UK, EU, Japan, Korea, Taiwan, Singapore, Canada, Australia, Switzerland, and Norway. This appears to capture most countries that have imposed sanctions on Russia, except for smaller players such as New Zealand, Iceland, Liechtenstein, certain ex-Warsaw Pact countries, and some island nations, such as the Bahamas. (For the most up-to-date list of sanctioning countries, *see* PIIE.)

The model is based on a standard Armington-type framework of international trade in which products are differentiated by source country, and consumers view products from different countries as imperfect substitutes.[9] As is typical, it is assumed that import demand features constant elasticity of substitution between import sources. The model also allows for exporter and importer market power (the "large-country" assumption). The basic intuition thereby is that, whenever export supply is imperfectly elastic and the importer has a sufficient degree of market power, exporters must absorb part of the tariff incidence by lowering their prices. Such lowering of export prices ("pass-through") improves the importing country's terms of trade (*i.e.*, the relative price at which the countries exchange goods and services), and results in a direct wealth transfer from the exporter to the importer.

To illustrate the basic economic mechanisms at work Figure 1 uses the example of an economically powerful Ally (or a coalition of Allies) implementing sanctions on Russia in the form of new or increased import tariffs. The figure is constructed in the typical price-quantity plane from the perspective of the sanctioning importer (call it Country *A*). The vertical axis plots the price at which Russian variety *v* of some import good *g* is sold in *A*. The horizontal axis plots import volumes from Russia. Import demand for variety *v* in Country *A* is downward-sloping, whereby the slope of the import demand curve (the import demand elasticity facing Russian exports) is an expression of importer market power.[10] Export supply is upward-sloping, whereby the slope (elasticity) is an expression of exporter market power.[11]

Point *X* denotes the equilibrium prior to the new tariff sanction (*i.e.*, the level of trade when Russia's exports were subject only to Country *A*'s MFN tariff).[12] Country *A* now imposes an extra import tariff of $\Delta\tau$ on variety *v*. By design, such policy drives a wedge between the price received by Russian suppliers and the price paid by *A*'s consumers. The new domestic price in Country *A* shifts upwards from $p^I_{v|\tau=0}$ to p^I_v. As a result of higher domestic prices, import volumes from Russia into Country *A* decrease from $X^I_{v|\tau=0}$ to X^I_v. Moreover, since Country *A* has importer market power in good *g*, its tariff increase depresses Russia's export price (from $p^I_{v|\tau=0}$ to p^*_v), thus making those imports that still occur after the imposition of the new tariff relatively cheaper for consumers in *A*. The reduction in Russia's per-unit export price for variety *v* defines the level of pass-through between Russian suppliers and *A*'s consumers, and thus Country *A*'s terms-of-trade gain resulting from the tariff increase. Depending on the identity of the importer, the sector targeted for sanctions, and the size of the additional tariff hike, the imposition of new tariffs may actually be welfare-enhancing for Country *A* (while it is always welfare-negative for Russia).[13]

[9] Armington (1969).

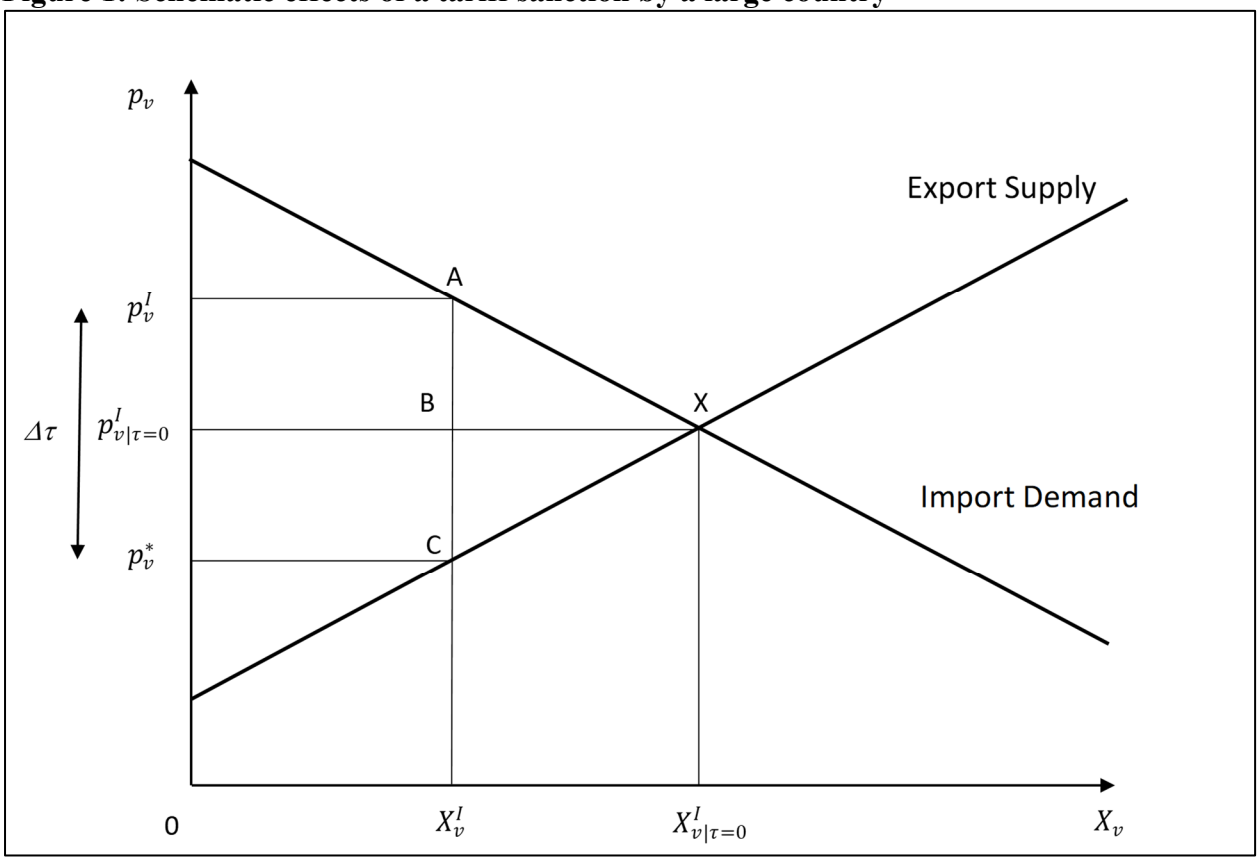
[10] The more inelastic (steeper) Country *A*'s import demand curve vis-à-vis Russia, the more dependent it is on Russian imports.

[11] The more inelastic (steeper) Russia's export supply elasticity vis-à-vis Country *A*, the fewer alternative export destinations Russia has for marketing its products elsewhere.

[12] For purely expositional purposes, it is assumed in Figure 1 that Country *A*'s pre-sanction MFN tariff is zero. This assumption is without loss of generality.

[13] Welfare *gains* result whenever the terms-of-trade gains reaped by Country *A* outweigh the efficiency losses suffered from artificially low import levels. This, of course, is the "optimal tariff" theory first espoused by Johnson (1953).

Figure 1: Schematic effects of a tariff sanction by a large country



2.2 Application of the model to the context at issue

While our PE model can be applied to a number of relevant policy questions,[14] for the purposes of this paper we limit application of the model to analyzing the economic effects of extra tariffs of 35% on each of those 570 product groups identified in Presidential Proclamation 10420. The following economic metrics are thereby of particular interest to our analysis:[15]

- **Trade affected:** This metric captures the pre-sanction trade value that is affected by the tariff increase. In Figure 2, this corresponds to the sum of surfaces **a**, **b**, **c**, and **f**. Note that the trade-affected metric is not an expression of economic effects *per se*, but it can be

[14] In addition to analyzing the economic effects of new tariff sanctions on a prescribed list of imports from Russia, our tool can just as easily be applied to evaluate potential target sectors from the entire universe of HS-6 sectors, so as to design economically efficient sanction packages based on policymakers' core objectives. The tool can also be applied to evaluate sanction types other than import tariffs (*e.g.*, export sanctions where Allies are exporters and Russia is the importer). The tool also can address other sanction-related policy questions, *e.g.*, assessing the marginal effect of including or excluding certain countries as part of a sanctioning coalition. Moreover, the framework can be applied to solve other trade-policy related questions, such as the design of retaliation schedules in trade disputes, or the economic implications of large-scale national-security related import barriers. Further information about the model framework, its methodology, and data inputs are available from the authors upon request.

[15] Figure 2, which is a modification of Figure 1, explains schematically the nature of these effects.

seen as an approximate measure of the economic relevance of a certain product group for the sanctioning Ally and for Russia.

- **Blocked trade**: This metric captures the import value that is interrupted as a result of the Ally's increased import tariff (surfaces **a**+**c** in Figure 2). While blocked trade is not an expression of *welfare* effects,[16] it is a useful metric to quantify the level of economic **decoupling** between the Ally and Russia that occurs in a given product group as a result of the new tariff sanctions.

- **Terms-of-trade gains to Ally:** Graphically depicted as rectangle **b** in Figure 2, this metric measures the reduced export value of those Russian sales that still occur after the tariff increase goes into effect. Compared to the pre-sanction situation, export revenues are depressed, because export sales occur at a lower price; these "income effects" represent a pure net wealth transfer from Russia to the importing Ally.

- **Tariff revenue:** As mentioned, the Biden Administration is seeking authority to use revenues collected on the 570 Russian goods to financially support Ukraine. It thus appears useful to quantify the disbursable amounts. Mathematically, tariff revenue is the increased tariff rate times the import value that still enters the Ally's market after the sanction has been imposed.[17] Graphically, tariff revenue consists of rectangles **d**+**b** in Figure 2,[18] whereas rectangle **b** constitutes the share of tariff revenue paid by Russian exporters on account of its terms-of-trade losses (*see* previous bullet point), and rectangle **d** is a domestic net wealth transfer between consumers and the government of the Allied country.

- **Total welfare effect to sanctioning Ally:** The total welfare effects from an increased tariff on imported variety *v* of good *g* sustained by the sanctioning country itself can be positive or negative, depending on the market power of the importer, the importance of the product for the importing economy, and the size of the tariff hike. Graphically, importer welfare effects are represented by rectangle **b** in Figure 2 (the terms-of-trade gains just discussed) minus triangle **e** (efficiency losses suffered by the Allied economy from inefficiently small import volumes).

- **Total welfare losses by Russia:** Russia as the exporting country is certain to lose from higher import tariffs. The question is merely how large those losses are going to be for each product group. Graphically, Russia's losses are the sum of rectangle **b** (the terms-of-trade losses discussed above) and triangle **c** (efficiency losses stemming from

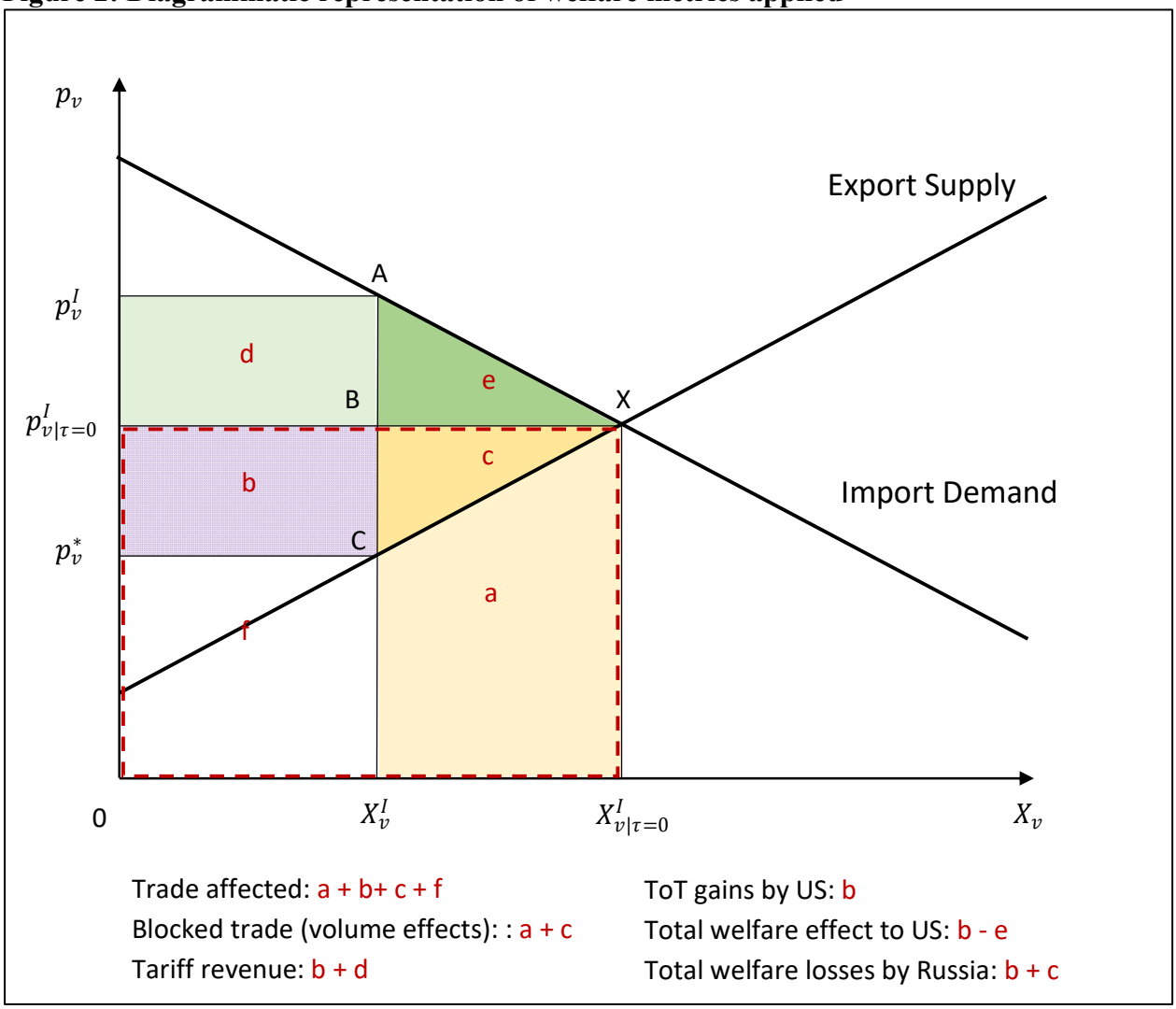
[16] Indeed, the conventional assumption in trade models is that Russia can either export blocked trade volumes elsewhere (*e.g.*, to India or China), or use them as inputs into its domestic production.

[17] Note that this metric measures *total* tariff revenues collected by the Ally after the imposition of its new tariff sanctions. This is different from additional, or *extra* tariff revenues, a figure that results from subtracting pre-sanction tariff revenues from those collected after the new sanctions are imposed. That difference can be positive or negative, depending on the import volumes demanded by domestic consumers after the imposition of the sanction (in an extreme case, tariff increases on a product with positive pre-sanction imports result in a complete disruption of trade, thus reaping zero tariff revenues after the imposition of tariff sanctions; the difference of post- to pre-sanction tariff revenues is then negative). While we only report on *total* tariff revenues in the main text of this paper, **Technical Appendix 1**, available for download alongside this paper, contains both tariff revenue metrics.

[18] This is true if Country *A*'s pre-sanction MFN tariff is zero, which we have assumed here (*see* footnote 12).

inefficiently low export volumes and the unfavorable resource reallocation within the Russian economy that ensues).

Figure 2: Diagrammatic representation of welfare metrics applied



For each product group included in the latest U.S. tariff sanction package, a system of equations can be solved with information on (i) pre-sanction trade data, (ii) the size of the extra tariff shock (in percentage points), and (iii) the relevant elasticities. As usual for this class of models, the quality of the predictions is fundamentally dependent on the quality of the elasticity estimates – particularly estimates for the importer's elasticity of substitution and elasticity of import demand, and bilateral export supply elasticity between exporting and importing countries. The model is implemented by using 2021 trade flow data from the World Bank's World Integrated Trade Solution (WITS) system as the pre-sanction baseline, and elasticity estimates compiled by Soderbery (2018; 2021). These elasticity estimates are available for specific country pairs (*e.g.*, U.S.–Russia).[19]

[19] The bilateral elasticities estimated by Soderbery (2018; 2021) are available at the HS 4-digit level.

As mentioned, our model can be implemented on the HS 6-digit level, which is the most granular level possible given data constraints. The U.S. tariff increases are, however, defined for 570 sectors at the HS 8-digit level. This requires us to aggregate the U.S. target list from the HS 8-digit to the HS 6-digit level. The aggregation to the HS 6-digit level reduces the number of distinguishable sectors from 570 to 393 individual product groups and likely increases somewhat the amount of trade flows covered by the model, and thus potentially the model results.[20] At the same time, there are no reliable elasticity estimates for 113 of the 393 HS 6-digit-level product groups.[21] We are thus able to apply the model (*i.e.*, quantify welfare results) to only 280 individual product groups. Due to these "missing observations" (and despite the over-inclusiveness that results from the aggregation of target sectors to the HS 6-digit level) the overall economic effects we report in Sections 3.1-3.3, below, will most likely underestimate the actual economic impacts of the new U.S. sanctions.[22]

3. Results

We now turn to the estimated economic effects that the new U.S. tariff increases will have on the economies of Russia and sanctioning countries. We first summarize the aggregate effects on the U.S. and Russian economies (Section 3.1). Next, assuming that the EU were to impose tariff increases identical in scope (*i.e.*, same target sectors) and scale (same tariff level vis-à-vis Russian imports) to those adopted by the United States, we estimate the aggregate effects that such "mirror sanctions" would have for the EU and Russia, and consider the combined impact that such alignment of U.S. and EU sanctions would have (Section 3.2). This is followed by a sector-level analysis of the new U.S. sanctions, in which we assess the inclusion of individual product groups selected by the United States (Section 3.3).

3.1 The aggregate effects of the new U.S. sanctions as announced

Table 1 summarizes our estimates for the aggregate economic effects on both the Russian and the U.S. economies resulting from new tariff increases on 570 product groups, as announced by the United States following the G7 Summit in Germany.

[20] An aggregation from the HS 8-digit to the HS 6-digit level reduces the degree of granularity in affected sectors. This likely results in over-inclusiveness (and thus inflation) of reported trade flows captured by the model, because the model may include product groups on the HS 8-digit level that are not actually subject to the new slate of U.S. tariff increases, but are swept into a particular product group on the HS 6-digit level.

[21] These 113 product groups together account for U.S. imports from Russia worth $278 million (or roughly 10% of all targeted imports) in 2021. **Technical Appendix 1**, available online, provides further detail. The Appendix contains the full slate of sectoral results for the U.S.

[22] As will be discussed in more detail below, there are further, methodological, reasons for why our estimates likely underestimate actual effects. For example, the partial-equilibrium nature of our model does not permit us to capture effects resulting from inter-industry linkages and economy-wide resource constraints.

In total, new U.S. import tariffs affect trade worth $2.68 billion per year (column (1)),[23] which represents roughly 8.7% of all U.S. imports from Russia.[24] We estimate that these tariff reduce trade in the affected product groups by 62% (compared to pre-sanction imports in 2021; *see* column (2)); cause annual welfare losses of $185 million to Russia (column (6)) at the cost of $98 million to U.S. consumers (column (5)); and generate disbursable tariff revenue amounting to $205 million per year (column (4)).[25]

Table 1: Total economic effects of announced tariff sanctions on Russia and United States

	(1) Trade affected (Ally's imports from Russia) (in $ '000)	(2) Blocked trade/ Decoupling (in % of pre-sanction imports of affected product groups; weighted average)	(3) Terms-of-trade gain to Ally (in $ '000)	(4) Tariff revenue (based on 35% tariff) (in $ '000)	(5) Welfare effect on Ally (in $ '000)	(6) Welfare loss for Russia (in $ '000)
United States	2,677,683	62%	97,632	205,066	-97,701	-184,901

Welfare losses of a magnitude of $180 million may not seem arresting, given Russia's 2021 GDP of $1.78 trillion, or even overall U.S. imports from Russia of $30.76 billion in 2021.[26] However, the bare figure may mask important economic circumstances, including the following. *First*, the estimated economic harm to Russia comes at the heels, and indeed on top, of multiple rounds of economic sanctions[27] that are already crippling the Russian economy.[28] *Second*, the U.S. tariff sanctions mainly concern non-energy products, which account for a much smaller portion of the Russian economy in general, and of total Russian exports in particular.[29] Thus, $185 million in welfare losses from non-fuel sectors may hurt the Russian economy more than the bare number suggests. *Third*, losing 62% of non-fuel exports to the United States (column (2)) may hit the Russian economy harder than our welfare estimates suggest, particularly given the ripple effects that export losses of higher value-added products may have for other domestic industries. (Owing to its PE set-up, our model cannot capture inter-industry linkages and economic ripple effects.) *Finally*, any aggregate loss figure may hide important dynamics that occur on the sectoral level. Effects in one sector may overwhelm (or even net out) those in other sectors. Similarly, it may well be that a well-targeted tariff sanction on a key Russian export sector has far-reaching political, social, or economic effects that get lost when looking at aggregate figures

[23] The U.S. Administration stated that its new tariff sanctions would affect Russian trade (*i.e.*, pre-sanction US imports of Russian goods) worth $2.3 billion. The discrepancy to our trade-affected results may be rooted in different baseline years used by the United States and us (as mentioned, we use the latest available trade data from 2021; the U.S. has not identified the year on which it bases its figure). More likely, however, the discrepancy is owed to the fact that our model is only able to capture economic effects on the HS 6-digit level, while the United States defined target sectors on the HS 8-digit level. As described, this implies that our model can only distinguish 393, rather than the 570 product groups selected by the United States. Footnote 20, above, explained that this lower level of granularity likely results in over-inclusiveness of trade flows, which in turn may lead to slightly inflated model results.

[24] In 2021 the United States imported goods worth $30.76 billion from Russia.

[25] These figures can be interpreted as *annual* effects if it is understood that the baseline year for measuring shocks is 2021, and that unrelated dynamics affecting Russian export supply or U.S. import demand and occurring post-2021 cannot be considered to predict effects in future years.

[26] *See* footnote 24, above.

[27] *See* footnote 3, above.

[28] *See*, *e.g.*, WTO (2022); Mahlstein et al. (2022).

[29] Indeed, according to figures dating back to 2019 oil and gas alone provided 39% of the Russia's federal budget and made up 60% of Russian exports.

alone. That is why a sector-by-sector analysis of the kind we perform in Section 3.3 appears ever more pertinent.

3.2 Potential aggregate effects of "mirror" sanctions by the EU

Table 2 reports estimates of potential economic effects that could ensue if the EU, as one of the United States' closest allies on Russia sanctions, were to align its actions and impose "mirror" sanctions, *i.e.*, apply the same 35% flat tariff on the same 570 product groups.[30]

Rows B to D of Table 2 summarize the results of potential sanctions imposed by Germany, France, and the entire EU, against Russia that mirror those announced by the United States.

Table 2: Total economic effects of announced tariff sanctions on Russia and imposing Allies

	Ally imposing sanctions	(1) Trade affected (Ally's imports from Russia) (in $ '000)	(2) Blocked trade/ Decoupling (in % of pre-sanction imports of affected product groups; weighted average)	(3) Terms-of-trade gain to Ally (in $ '000)	(4) Tariff revenue (based on 35% tariff) (in $ '000)	(5) Welfare effect on Ally (in $ '000)	(6) Welfare loss for Russia (in $ '000)
A	**United States**	2,677,683	62%	97,632	205,066	-97,701	-184,901
B	**EU**	6,400,186	61%	348,998	536,305	-82,110	-575,310
C	**Germany**	1,820,637	59%	126,430	173,845	16,047	-192,441
D	**France**	410,728	51%	21,613	43,377	-4	-30,934
E	**Total US and EU**	**9,077,869**		**446,630**	**741,370**	**-179,810**	**-760,212**

Looking at the EU as a whole (row B), mirror sanctions would affect trade worth $6.4 billion per year (column (1)), and reduce trade in the affected sectors by 61% (column (2)). Furthermore, across the universe of sectors selected by the United States European tariff imports would: impose welfare losses to Russia amounting to $575 million per year (column (6)); cause welfare losses to the EU's own economy would be $82 million (column (5)); and generate disbursable tariff revenue of $536 million per year (column (4)).

Germany (row C), as a major trading partner of Russia would contribute more than a third to the total harm inflicted on Russia by the EU (column (6)). Interestingly, Germany would even achieve a welfare *gain* of $16 million on account of its powerful market position vis-à-vis Russia in the selected product groups (column (5)). France's exposure to imports from Russia is less than a quarter of Germany's (Row D, column (1)), and its contribution to Russian welfare losses is a third of Germany's (column (6)).

Comparing the economic impact generated by U.S. and EU sanctions, one can see the effects of deeper economic integration between Russia and the EU. Mirror sanctions by the EU would tend to have more "bite", both in absolute and relative terms, than those by the United States. Compared to the United States, both affected trade and welfare losses to Russia are more than

[30] We do not opine on how realistic the prospect is of the EU enacting import sanctions that exactly mirror in scale and scope those imposed by the United States. We are not aware of any statement by the EU (or the G7) as to what "close coordination" between the United States and other Allies would look like in practice going forward. It is certainly possible that the EU is currently drawing up a separate list of target sectors and tariff increases. On account of this uncertainty, we do not present a product-by-product analysis of the type we perform in Section 3.3, below, for the EU. Such sectoral breakdown for the EU, Germany, and France, however, is available from the authors upon request.

twice as high if the EU were to impose mirror sanctions. Looking at the ratio of self-harm (column (5)) to harm to Russia (column (6)) – call this metric the "cost share" of sanctions[31] – we also detect a striking difference between the United States and the EU: The United States' cost share is nearly 53% ($82.1 million/$184.9 million), while that for the EU is only 14% ($82.1 million/$575.3 million).[32] In other words, for the universe of target sectors chosen by the U.S. Administration, the United States pays a relatively higher price for its sanctions than the EU would.

Row E of Table 2 sums the economic effects reported for United States and EU individually. As column (6) reports, concerted action by United States and the EU may cause welfare losses of $760 million to Russia (joint welfare losses suffered by the two Allies would be $180 million, resulting in a cost share of 23.7%).[33]

The results summarized in Table 2 suggest that it may be in the United States' interest to convince the EU to align its actions with the United States and impose mirror sanctions against Russia.[34]

3.3 Sectoral analysis of the new U.S. tariff increases

The sector-level design and implementation of our model enables us to analyze the economic effects of the new U.S. sanctions for each affected product group.[35] For obvious reasons we cannot go through the results line-item by line-item and refer the interested reader to Technical Appendix 1, which contains a full set of sectors. (That Appendix also allows the reader to replicate all results presented in the following sections.) Below, we limit ourselves to the presentation of several insightful observations[36] that we distilled from the product-level analysis.

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[31] Mathematically, the cost share is strictly positive, and only works for situations in which both Russia and the sanctioning country incur negative wealth effects. The closer the cost share is to zero percent, the better for the sanctioning Ally.

[32] Looking inside the EU, the cost share for France is practically zero, while Germany would suffer no costs at all from imposing mirror sanctions (*compare* columns (5) and (6)).

[33] This combined harm to Russia must, however, be seen as the lower end of the actual effects. *First*, the effects reported in Table 2 are estimated for individual, not joint, action by the United States and the EU, respectively. If both Allies were to combine forces and become one large export region (from Russia's perspective), this would affect supply and demand elasticity estimates, because the United States and the EU together would exercise even higher purchasing power vis-à-vis Russian exports, thus further tilting results in favor of the two Allies (in other words, Russian export supply elasticities vis-à-vis the Allies would become steeper, and Allied import demand elasticities vis-à-vis Russia would flatten). However, in the current model we have not modified supply and demand elasticity estimates that would reflect such joint market power. *Second*, as mentioned, we are unable to report effects for 113 out of 393 product groups on account of missing elasticity data. Evidently, results for any additional sector would only increase Russian welfare losses.

[34] In our concluding remarks (Section 4) we briefly discuss whether joining the United States and imposing mirror sanctions would also be in the EU's best interest.

[35] As mentioned, our analysis covers 393 individual product groups on the HS 6-digit level, affecting $2.67 billion in U.S. imports from Russia (*see* footnote 23). However, due to data constraints we are only able to estimate model results for 280 of the 393 product groups. These 280 product groups cover $2.4 billion of Russian imports in 2021 (90% of all imports affected by the new US sanctions).

[36] Our assessment is guided purely by *economic* considerations. We appreciate that the issue of sanction design may equally be driven by *political* exigencies and opportunities. A discussion of political reasons for including (or not

Observation 1: Target sectors for which imports from Russia are economically insignificant from the perspective of the United States

As a matter of first impression, we note that for many target sectors, imports of Russian origin are economically insignificant to the U.S. economy. Of the 393 sectors that our model can distinguish, 291 feature imports from Russia into the United States (or "affected trade") in 2021 of less than $500,000. In relative terms, for 352 out of the 393 product groups, Russian imports account for less than 3% of worldwide U.S. imports.[37]

The flipside of this observation is that for very few target sectors, imports of Russian origin are truly economically significant for the U.S. economy – either in an absolute and relative sense. Assessing the significance of target sectors for the United States in the *absolute* (dollar) sense, Table 3 lists the top-10 sectors in terms of "trade affected". As Table 3 shows, the 10 largest target sectors collectively cover $1.98 billion, or 74%, of all affected U.S. imports (column (1)), and cause $117 million, or 63%, of total welfare losses inflicted on Russia (column (8)). However, at the same time, new import tariffs on these 10 sectors generate significant self-harm to the United States ($109 million, or 111%, of total damages;[38] column (6)).[39]

Regarding the *relative* importance of Russian imports, Table 4 lists all target sectors for which Russia's share in worldwide imports by the United States is in the double-digits (column (2)).[40] As shown, only 12 product groups satisfy this criterion. These 12 target sectors cover $1.5 billion, or 57%, of affected U.S. imports from Russia (column (1)), and inflict $101 million, or 55%, of total welfare losses to Russia (column (9)). However, at the same time new U.S. tariff sanctions in these sectors cause significant self-harm to the United States ($98 million, or 101%, of total damages; column (6)). Consequently, self-harm to the United States from increased tariffs on those 12 products is nearly equal to harm imposed on Russia, resulting in a very unfavorable cost share of 97% from the perspective of the United States.

Table 3 and Table 4 thus illustrate that for sectors for which U.S. import demand vis-à-vis Russia is high new tariffs can impose significant welfare losses on Russia. At the same time, they may also contribute disproportionally to the United States' own welfare losses. This shows that the pre-sanction size of a target sector is no panacea: On the one hand, it may imply strong purchaser power by the United States vis-à-vis Russia, and hence the potential for significant harm. On the other hand, large sectors may equally entail import dependencies, and hence to potential for significant self-harm.

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including) certain sectors in the U.S. sanctions schedule is beyond the scope of this paper, and, more importantly, beyond the expertise of the authors.

[37] *See* Technical Appendix 1, column "Russia's share in all US imports" for details.

[38] The figure of 111% of total welfare losses to the United States can be explained by the fact that new U.S. tariff increases on several other sectors induce welfare *gains* for the U.S. economy. More on that in Observation 2, below.

[39] The estimates for welfare losses to Russia and the United States in Table 3 are likely underestimations, because we lack estimates for two important import sectors (HS 710691 and HS 711590).

[40] This threshold of 10% share of Russian in total imports, like other thresholds introduced over the course of this section, is somewhat arbitrary. Threshold selections are mainly driven by the intention to keep the number of rows in the tables manageable.

As we can see, large target sectors can pose problems for the United States. There are valid reasons for including additional smaller sectors for which Russia is a minor import source.[41] Indeed, the descriptive statistics above suggest that the United States was justified in not just going after the big and economically important import sectors, and instead adopting a "long-tail approach" that targets hundreds of product groups for which importation from Russia may be less significant to the U.S. economy, but that collectively cause substantial additional harm to the Russian economy.

That said, there is one category of economically insignificant target sectors, for which the observer may question the effectiveness and may ponder whether the benefits really outweigh the economic costs to the U.S. economy. This subgroup is composed of those product groups for which imports from Russia are insignificant to the U.S. economy and Russian exports to the United States are insignificant for the Russian economy.[42] This subgroup covers over half of the sectors that our model can distinguish (226 out of 393 product groups for which we have trade data) and for which we can generate estimates (157 out of the 280 product groups for which we have elasticity data). U.S. tariff increases on these 157 sectors impose only minute economic damage of roughly $4.4 million to Russia, but also entail self-harm of $3.9 million to the U.S. economy, for a highly unfavorable cost share of 90%.[43] From an economic perspective, thus, the inclusion of this subgroup of sectors appears questionable. The fact that the United States *did* include these sectors then suggests to us that the U.S. Administration had weighty *non*-economic reasons for targeting those product groups.

[41] One explanation for the United States including hundreds of economically insignificant product groups may be that, while Russia's share in U.S. imports is negligible, the United States may still be an important destination for Russian exports. Indeed, this is the case for at least 40 sectors (when we define as "insignificant" Russian shares in all US imports of smaller than 3%, and as "important" US shares in Russian exports of larger than 20%); *see* Technical Appendix 1. Another explanation may be coordination with other Allies, where the inclusion of certain sectors for which Russian imports are largely irrelevant to the United States occurred at the request of Allies. Yet another reason may be political opportunities or exigencies that convinced the Biden Administration to include certain sectors. For example, the United States may have intelligence that affected export interests have political clout in Russia, in which case, U.S. tariff increases in these sectors may be effective, even if pre-sanction trade volumes were minor. A final explanation we can think of may be symbolism or a motivation to artificially inflate the U.S. sanctions list to make U.S. action seem more decisive than it truly is.

[42] As before, we define economically insignificant as shares of less than 3% of total imports and exports, respectively. *See* columns ("Russia's share in all US imports" and "US share in Russian exports") in Technical Appendix 1 for details.

[43] *See* columns ("Welfare loss for Russia" and "Welfare effect on US") in Technical Appendix 1 for details.

Table 3: Top-10 economically significant sectors for United States (by affected trade)

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)
720712	Semi-finished products of iron or non-alloy steel containing, by weigh ...	926,528	77%	89%	33,020	8,326	-102,441	-11%	-41,734	-5%
720221	Ferro-silicon, containing by weight > 55% of silicon	235,156	63%	58%	30,474	11,803	-2,140	-1%	-19,938	-8%
930630	Cartridges for smooth-barrelled shotguns, revolvers and pistols and ca ...	169,032	55%	56%	22,044	11,675	2,538	2%	-19,053	-11%
710691	Silver, incl. silver plated with gold or platinum, unwrought (excludin ...	143,939	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
720249	Ferro-chromium, containing by weight <= 4% of carbon	122,544	63%	58%	15,806	6,144	-1,167	-1%	-10,409	-8%
711590	Articles of precious metal or of metal clad with precious metal, n.e.s ...	93,438	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
780110	Unwrought lead, refined	92,344	57%	48%	14,315	7,161	2,710	3%	-10,460	-11%
740811	Wire of refined copper, with a maximum cross-sectional dimension of > ...	72,363	50%	84%	3,477	1,947	-3,076	-4%	-6,903	-10%
730429	Casing and tubing, seamless, of iron or steel, of a kind used in drill ...	63,258	73%	50%	10,060	3,042	-960	-2%	-4,548	-7%
722490	Semi-finished products of alloy steel other than stainless	61,794	72%	73%	5,198	1,621	-4,080	-7%	-3,852	-6%
	Subtotal (10 most affected product groups)	**1,980,396**			**134,395**		**-108,616**		**-116,897**	
	Total (all 570 product groups; *see* Table 1)	**2,677,799**			**205,066**		**-97,701**		**-184,901**	
	Share	**74%**			**66%**		**111%**		**63%**	

Table 4: Top economically significant sectors for United States (by Russia's import share)

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Russia's share in total US imports (in %)	(3) Pass-through to US consumers (in %)	(4) Blocked trade/ Decoupling (in % of pre-sanction imports)	(5) Tariff revenue (based on 35% tariff; in $ '000)	(6) Terms-of-trade gains to US (in $ '000)	(7) Welfare effect on US (in $ '000)	(8) Welfare effect on US (in % of pre-sanction imports)	(9) Welfare loss for Russia (in $ '000)	(10) Welfare loss for Russia (in % of pre-sanction imports)
720712	Semi-finished products of iron or non-alloy steel containing, by weigh ...	926,528	22%	77%	89%	33,020	8,326	-102,441	-11%	-41,734	-5%
720221	Ferro-silicon, containing by weight > 55% of silicon	235,156	57%	63%	58%	30,474	11,803	-2,140	-1%	-19,938	-8%
930630	Cartridges for smooth-barrelled shotguns, revolvers and pistols and ...	169,032	17%	55%	56%	22,044	11,675	2,538	2%	-19,053	-11%
720249	Ferro-chromium, containing by weight <= 4% of carbon	122,544	54%	63%	58%	15,806	6,144	-1,167	-1%	-10,409	-8%
400239	Halo-isobutene-isoprene rubber CIIR or BIIR, in primary forms or in pl ...	24,102	19%	31%	45%	3,540	3,244	2,669	11%	-4,549	-19%
400231	Isobutylene isoprene rubber IIR, in primary forms or in plates, sheets ...	14,949	47%	31%	45%	2,195	2,012	1,655	11%	-2,821	-19%
400220	Butadiene rubber BR, in primary forms or in plates, sheets or strip ...	12,597	10%	31%	45%	1,850	1,696	1,395	11%	-2,378	-19%
291611	Acrylic acid and its salts	6,719	12%	100%	74%	604	0	-769	-11%	0	0%
281290	Halides and halide oxides of non-metals (excluding chlorides and ...	3,515	12%	61%	43%	620	248	106	3%	-340	-10%
870110	Pedestrian-controlled agricultural tractors and similar tractors for i ...	2,213	26%	80%	70%	214	47	-169	-8%	-103	-5%
710221	Industrial diamonds unworked or simply sawn, cleaved or bruted	608	14%	100%	98%	4	0	-104	-17%	0	0%
441874	Flooring panels for mosaic floors, assembled, of wood other than ...	159	44%	51%	34%	31	17	12	8%	-21	-13%
	Subtotal (most important product groups)	**1,518,122**				**110,402**		**-98,416**		**-101,347**	
	Total (all 570 product groups; *see* Table 1)	**2,677,799**				**205,066**		**-97,701**		**-184,901**	
	Share	**57%**				**54%**		**101%**		**55%**	

Observation 2: Target sectors with positive welfare effects for United States

The sanction package selected by the United States includes numerous sectors for which tariff increases result in welfare *gains* to the U.S. economy. We find it useful to distinguish between *absolute* gains (*i.e*., welfare gains of high dollar value) and *relative* gains (*i.e.*, high welfare gains as a percentage of pre-sanction trade flows). Table 5 and Table 6 summarize.

Table 5 lists all product groups for which new U.S. tariff increases to 35% result in *absolute* welfare gains exceeding $250,000.[44] These 17 product lines affected 2021 imports worth $527 million, and we estimate welfare gains to the U.S. economy amounting to $26 million, while causing Russian welfare losses of roughly $70 million.

Next, Table 6 contains all product groups that generate particularly high *relative* welfare gains to the U.S. economy, which we define as gains in excess of 10% of pre-sanction imports. Of the 26 sectors listed, eight are also part of Table 5. Overall, sectors in which tariff increases produce high relative welfare gains affect $113 million in imports, generate $13 million in economic gains to the United States, and cause $21 million in welfare losses to Russia.

In sum, the U.S. sanctions package contains a number of product groups for which the U.S. tariff increases generate particularly high welfare gains to the U.S. economy, either in absolute or relative terms. Since new tariffs in these sectors also causes considerable economic damage to the Russian economy as well as substantial tariff revenues, inclusion of these sectors may be especially effective.

Observation 3: Target sectors with particularly negative welfare effects on Russia

The U.S. sanction package further covers many product groups whose inclusion causes particularly large welfare losses to Russia. We again distinguish between *absolute* losses to Russia and *relative* losses.[45] Table 7 and Table 8 summarize.

Table 7 lists all product groups for which new U.S. tariff increases inflict Russian welfare losses in excess of $1 million.[46] These 25 sectors together affect $2.19 billion in 2021 trade (column (1)) and cause a total of $170 million to the Russian economy (column (8)). However, at the same time, new U.S. tariffs on these products cost the U.S. economy of $93 million (resulting in a "cost share" of 54%; column (6)). Additionally, the United States can expect to generate $199 million in tariff revenues (column 4)).

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[44] Welfare gains to the U.S. economy emerge in those sectors in which (i) the U.S. enjoys market power vis-à-vis Russia (low levels of pass-through; *see* column (2)), and (ii) pre-sanction MFN tariffs that were set at inefficiently low levels. Tariff increases are then economically beneficial, because the United States can shift much of the economic costs of tariff increases on Russian exporters via terms-of-trade effects. *See* discussion around footnote 13, above.

[45] Relative welfare losses are not to be conflated with "blocked trade". While both metrics are measured in % of pre-import sanctions, the former measures real economic losses, while the latter simply measures bilateral trade that is no longer occurring (but Russia may export goods to other countries or use them for domestic purposes; either way, blocked trade values do not necessarily represent welfare losses).

[46] Note that this list contains some product groups whose inclusion may be seen as problematic (*see* Observations 4 to 6, below). Examples are the inclusion of HS codes 720712 and 722490 for which U.S. welfare losses are larger than Russia's (*see* column (10) of Table 10).

Table 8 contains all product groups that cause high *relative* welfare losses to the Russian economy, which we define as losses in excess of 20% of pre-sanction imports to the United States. While many of the product groups listed in Table 8 concern small import volumes (*see* column (1)), welfare losses of magnitudes exceeding 20% will certainly hurt those Russian businesses engaged in exports of the affected product groups. If affected exporters happen to have political clout in Russia, U.S. sanctions in these sectors may be effective, even if trade volumes are minor. A further benefit of targeting the sectors listed in Table 8 is that extra U.S. tariffs yield total welfare *gains* to the United States of $1.6 million (*see* column (6)).[47]

In sum, the U.S. tariff sanctions package contains dozens of product groups for which the new U.S. tariff increases cause particularly high damage, either in absolute or relative terms. When appropriately weighted against harm caused to the U.S. economy (*see* Observation 5, below), inclusion of these sectors may be particularly effective.

[47] This is so, since large Russian losses typically occur in those sectors in which Russian exporters have relatively small market power vis-à-vis U.S. consumers. This results in small pass-throughs to U.S. consumers and large terms-of-trade gains to the U.S. economy. We note significant overlap between Table 8 and Table 6, above, in which we listed those sectors in which the United States generated particularly high welfare gains.

Table 5: Sectors with high *absolute* welfare gains for United States

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)
400219	Styrene-butadiene rubber SBR; carboxylated styrene-butadiene rubber ...	38,661	31%	45%	5,678	5,204	4,281	11%	-7,297	-19%
760511	Wire of non-alloy aluminium, with a maximum cross-sectional dim ...	60,869	49%	39%	10,809	6,067	4,155	7%	-8,030	-13%
780110	Unwrought lead, refined	92,344	57%	48%	14,315	7,161	2,710	3%	-10,460	-11%
400239	Halo-isobutene-isoprene rubber CIIR or BIIR, in primary forms or in ...	24,102	31%	45%	3,540	3,244	2,669	11%	-4,549	-19%
930630	Cartridges for smooth-barrelled shotguns, revolvers and pistols and ...	169,032	55%	56%	22,044	11,675	2,538	2%	-19,053	-11%
401110	New pneumatic tyres, of rubber, of a kind used for motor cars, incl. ...	43,421	47%	49%	6,473	3,678	2,114	5%	-5,440	-13%
400231	Isobutylene isoprene rubber IIR, in primary forms or in plates, sheets ...	14,949	31%	45%	2,195	2,012	1,655	11%	-2,821	-19%
400220	Butadiene rubber BR, in primary forms or in plates, sheets or strip ...	12,597	31%	45%	1,850	1,696	1,395	11%	-2,378	-19%
401120	New pneumatic tyres, of rubber, of a kind used for buses and lorries ...	14,344	47%	49%	2,138	1,215	698	5%	-1,797	-13%
760429	Bars, rods and solid profiles, of aluminium alloys, n.e.s.	18,675	51%	51%	2,721	1,423	664	4%	-2,157	-12%
400259	Acrylonitrile-butadiene rubber NBR, in primary forms or in plates, ...	5,988	31%	45%	879	806	663	11%	-1,130	-19%
392690	Articles of plastics and articles of other materials of heading 3901 ...	5,770	39%	35%	1,061	716	595	10%	-910	-16%
845530	Rolls for metal-rolling mills	3,869	25%	44%	563	574	500	13%	-795	-21%
390461	Polytetrafluoroethylene, in primary forms	14,399	59%	44%	2,477	1,059	461	3%	-1,466	-10%
284190	Salts of oxometallic or peroxometallic acids (excluding chromates, ...	1,152	7%	6%	266	319	318	28%	-329	-29%
940350	Wooden furniture for bedrooms (excluding seats)	1,645	29%	21%	341	325	308	19%	-368	-22%
870829	Parts and accessories of bodies for tractors, motor vehicles for the ...	5,440	48%	49%	802	473	259	5%	-702	-13%
	Subtotal (selected product groups)	**527,257**			**78,154**	**47,645**	**25,984**		**-69,682**	

Table 6: Sectors with high *relative* welfare gains for United States

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)
490210	Newspapers, journals and periodicals, whether or not illustrated ...	121	11%	10%	26	34	34	28%	-36	-30%
490290	Newspapers, journals and periodicals, whether or not illustrated ...	421	11%	10%	91	118	117	28%	-125	-30%
282760	Iodides and iodide oxides (excluding inorganic or organic compounds ...	161	42%	34%	30	20	17	10%	-26	-16%
284190	Salts of oxometallic or peroxometallic acids (excluding chromates, ...	1,152	7%	6%	266	319	318	28%	-329	-29%
940350	Wooden furniture for bedrooms (excluding seats)	1,645	29%	21%	341	325	308	19%	-368	-22%
282739	Chlorides (excluding ammonium, calcium, magnesium, aluminium, nickel	312	42%	32%	61	38	32	10%	-47	-15%
731010	Tanks, casks, drums, cans, boxes and similar containers, of iron or st ...	145	26%	27%	27	27	26	18%	-32	-22%
842111	Centrifugal cream separators	237	30%	24%	48	44	41	17%	-51	-21%
950699	Articles and equipment for sport and outdoor games n.e.s; swimming ...	485	29%	23%	100	87	82	17%	-101	-21%
846229	Bending, folding, straightening or flattening machines for flat produc ...	303	22%	31%	56	50	47	15%	-61	-20%
282720	Calcium chloride	655	42%	36%	116	85	68	10%	-109	-17%
848340	Gears and gearing for machinery (excluding toothed wheels, chain ...	267	29%	31%	49	45	41	15%	-55	-21%
848310	Transmission shafts, incl. cam shafts and crank shafts, and cranks	123	29%	31%	23	21	19	15%	-25	-21%
282759	Bromides and bromide oxides (excluding of sodium, potassium and ...	139	42%	34%	26	18	14	10%	-22	-16%
392690	Articles of plastics and articles of other materials of heading 3901 ...	5,770	39%	35%	1,061	716	595	10%	-910	-16%
294200	Separate chemically defined organic compounds, n.e.s.	107	27%	32%	19	17	16	15%	-21	-20%
845530	Rolls for metal-rolling mills	3,869	25%	44%	563	574	500	13%	-795	-21%
441510	Cases, boxes, crates, drums and similar packings, of wood; cable-drums ...	181	35%	30%	35	26	23	13%	-31	-17%
870323	Motor cars and other motor vehicles principally designed for the trans ...	186	32%	37%	32	26	22	12%	-34	-18%
854430	Ignition wiring sets and other wiring sets for vehicles, aircraft or s ...	455	42%	31%	89	59	50	11%	-73	-16%
400219	Styrene-butadiene rubber SBR; carboxylated styrene-butadiene rubber X	38,661	31%	45%	5,678	5,204	4,281	11%	-7,297	-19%
400239	Halo-isobutene-isoprene rubber CIIR or BIIR, in primary forms or in pl ...	24,102	31%	45%	3,540	3,244	2,669	11%	-4,549	-19%
400259	Acrylonitrile-butadiene rubber NBR, in primary forms or in plates, she ...	5,988	31%	45%	879	806	663	11%	-1,130	-19%
400220	Butadiene rubber BR, in primary forms or in plates, sheets or strip ...	12,597	31%	45%	1,850	1,696	1,395	11%	-2,378	-19%
400231	Isobutylene isoprene rubber IIR, in primary forms or in plates, sheets ...	14,949	31%	45%	2,195	2,012	1,655	11%	-2,821	-19%
820559	Hand tools, incl. glaziers' diamonds, of base metal, n.e.s.	308	39%	33%	58	40	34	11%	-50	-16%
	Subtotal (selected product groups)	**113,339**			**17,260**	**15,651**	**13,064**		**-21,476**	

Table 7: Sectors with high *absolute* losses to Russia

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)
720712	Semi-finished products of iron or non-alloy steel containing, by weigh ...	926,528	77%	89%	33,020	8,326	-102,441	-11%	-41,734	-5%
720221	Ferro-silicon, containing by weight > 55% of silicon	235,156	63%	58%	30,474	11,803	-2,140	-1%	-19,938	-8%
930630	Cartridges for smooth-barrelled shotguns, revolvers and pistols and ca ...	169,032	55%	56%	22,044	11,675	2,538	2%	-19,053	-11%
780110	Unwrought lead, refined	92,344	57%	48%	14,315	7,161	2,710	3%	-10,460	-11%
720249	Ferro-chromium, containing by weight <= 4% of carbon	122,544	63%	58%	15,806	6,144	-1,167	-1%	-10,409	-8%
760511	Wire of non-alloy aluminium, with a maximum cross-sectional dimension	60,869	49%	39%	10,809	6,067	4,155	7%	-8,030	-13%
400219	Styrene-butadiene rubber SBR; carboxylated styrene-butadiene rubber XS	38,661	31%	45%	5,678	5,204	4,281	11%	-7,297	-19%
740811	Wire of refined copper, with a maximum cross-sectional dimension of > ..	72,363	50%	84%	3,477	1,947	-3,076	-4%	-6,903	-10%
401110	New pneumatic tyres, of rubber, of a kind used for motor cars, incl. s ...	43,421	47%	49%	6,473	3,678	2,114	5%	-5,440	-13%
400239	Halo-isobutene-isoprene rubber CIIR or BIIR, in primary forms or in pl ...	24,102	31%	45%	3,540	3,244	2,669	11%	-4,549	-19%
730429	Casing and tubing, seamless, of iron or steel, of a kind used in drill ...	63,258	73%	50%	10,060	3,042	-960	-2%	-4,548	-7%
730629	Casing and tubing of a kind used in drilling for oil or gas, welded, o ...	53,940	68%	53%	7,796	2,845	-566	-1%	-4,477	-8%
722490	Semi-finished products of alloy steel other than stainless	61,794	72%	73%	5,198	1,621	-4,080	-7%	-3,852	-6%
400231	Isobutylene isoprene rubber IIR, in primary forms or in plates, sheets ...	14,949	31%	45%	2,195	2,012	1,655	11%	-2,821	-19%
720230	Ferro-silico-manganese	32,849	63%	56%	4,517	1,670	-124	0%	-2,717	-8%
720241	Ferro-chromium, containing by weight > 4% of carbon	27,806	63%	59%	3,486	1,383	-337	-1%	-2,387	-9%
400220	Butadiene rubber BR, in primary forms or in plates, sheets or strip ...	12,597	31%	45%	1,850	1,696	1,395	11%	-2,378	-19%
760429	Bars, rods and solid profiles, of aluminium alloys, n.e.s.	18,675	51%	51%	2,721	1,423	664	4%	-2,157	-12%
760612	Plates, sheets and strip, of aluminium alloys, of a thickness of > 0,2 ...	30,912	66%	67%	3,202	1,062	-988	-3%	-2,138	-7%
720211	Ferro-manganese, containing by weight > 2% of carbon	24,165	63%	60%	2,971	1,195	-336	-1%	-2,089	-9%
401120	New pneumatic tyres, of rubber, of a kind used for buses and lorries (...	14,344	47%	49%	2,138	1,215	698	5%	-1,797	-13%
390461	Polytetrafluoroethylene, in primary forms	14,399	59%	44%	2,477	1,059	461	3%	-1,466	-10%
860719	Axles, for electrical purposes, and wheels and parts thereof for railw ...	18,075	67%	57%	2,398	847	-336	-2%	-1,418	-8%
400259	Acrylonitrile-butadiene rubber NBR, in primary forms or in plates, she ...	5,988	31%	45%	879	806	663	11%	-1,130	-19%
293190	Separate chemically defined organo-inorganic compounds (excluding orga	12,615	63%	56%	1,700	656	-51	0%	-1,078	-9%
	Subtotal (selected product groups)	**2,191,386**			**199,225**	**87,781**	**-92,600**		**-170,267**	

Table 8: Sectors with high *relative* losses to Russia

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)
490290	Newspapers, journals and periodicals, whether or not illustrated or co ...	421	11%	10%	91	118	117	28%	-125	-30%
490210	Newspapers, journals and periodicals, whether or not illustrated or co ...	121	11%	10%	26	34	34	28%	-36	-30%
284190	Salts of oxometallic or peroxometallic acids (excluding chromates, dic ...	1,152	7%	6%	266	319	318	28%	-329	-29%
846090	Machines for deburring, grinding or polishing metals, metal carbides o ...	4	17%	14%	1	1	1	22%	-1	-24%
846039	Sharpening tool or cutter grinding machines, not numerically controlle ...	38	17%	14%	9	8	8	22%	-9	-24%
731010	Tanks, casks, drums, cans, boxes and similar containers, of iron or st ...	145	26%	27%	27	27	26	18%	-32	-22%
731029	Tanks, casks, drums, cans, boxes and similar containers, of iron or st ...	3	26%	27%	1	1	1	18%	-1	-22%
940370	Furniture of plastics (excluding medical, dental, surgical or veterina ...	10	29%	21%	2	2	2	19%	-2	-22%
940350	Wooden furniture for bedrooms (excluding seats)	1,645	29%	21%	341	325	308	19%	-368	-22%
852349	Optical media for the recording of sound or of other phenomena (exclud ...	8	22%	37%	1	1	1	16%	-2	-22%
842111	Centrifugal cream separators	237	30%	24%	48	44	41	17%	-51	-21%
950611	Skis, for winter sports	56	29%	24%	11	10	10	17%	-12	-21%
491191	Pictures, prints and photographs, n.e.s.	50	22%	46%	7	7	7	13%	-11	-21%
491110	Trade advertising material, commercial catalogues and the like	7	22%	46%	1	1	1	13%	-1	-21%
950699	Articles and equipment for sport and outdoor games n.e.s; swimming and ...	485	29%	23%	100	87	82	17%	-101	-21%
845530	Rolls for metal-rolling mills	3,869	25%	44%	563	574	500	13%	-795	-21%
845590	Parts of metal-rolling mills, n.e.s.	15	25%	44%	2	2	2	13%	-3	-21%
848310	Transmission shafts, incl. cam shafts and crank shafts, and cranks	123	29%	31%	23	21	19	15%	-25	-21%
848340	Gears and gearing for machinery (excluding toothed wheels, chain sproc ...	267	29%	31%	49	45	41	15%	-55	-21%
846229	Bending, folding, straightening or flattening machines for flat produc ...	303	22%	31%	56	50	47	15%	-61	-20%
848390	Toothed wheels, chain sprockets and other transmission elements preser ...	59	29%	30%	11	10	9	15%	-12	-20%
294200	Separate chemically defined organic compounds, n.e.s.	107	27%	32%	19	17	16	15%	-21	-20%
680430	Hand sharpening or polishing stones	63	34%	31%	12	10	9	14%	-12	-20%
680410	Millstones and grindstones, without frameworks, for milling, grinding ...	55	34%	31%	10	9	8	14%	-11	-20%
680423	Millstones, grindstones, grinding wheels and the like, without framewo ...	20	34%	31%	4	3	3	14%	-4	-20%
680422	Millstones, grindstones, grinding wheels and the like, without framewo ...	11	34%	31%	2	2	2	14%	-2	-20%
680421	Millstones, grindstones, grinding wheels and the like, without framewo ...	97	34%	31%	18	15	14	14%	-19	-20%
	Subtotal (selected product groups)	**9,371**			**1,700**	**1,744**	**1,623**		**-2,102**	

Observation 4: Target sectors for which US sanctions result in blocked trade

Another interesting feature of the new U.S. tariffs is that application of a 35% tariff will lead to a complete or near-complete interruption of import activity from Russia ("blocked trade") in a number of sectors. This entails certain policy advantages, but also significant economic costs from the U.S. perspective.

Table 9 lists all product groups for which new U.S. tariff increases will result in fully or largely blocked trade (*see* column (3)).[48] This is the case for 30 sectors that together covered an amount of $17 million in U.S. imports (*see* column (1)) in 2021. If U.S. policymakers' objective is to achieve a decoupling of the U.S. economy from Russian imports (and thus, to reduce dependency from Russian sources), then the inclusion of these 24 sectors may make sense. However, total (or near-total) decoupling comes at steep economic costs for the United States. As Table 9 illustrates, full decoupling (100% blocked trade) results in:

(i) Zero tariff revenues to the United States (column (4)), because blocked trade implies no imports that could generate tariff revenues;

(ii) Assured welfare losses (in absolute terms) to the United States (columns (6) and (7)), since zero imports entail zero terms-of-trade gains that could counterbalance efficiency losses to U.S. consumers that are certain to occur due to depressed demand resulting from higher domestic prices;[49] and,

(iii) Relative welfare losses (*i.e.*, relative to Russia) to the U.S. economy, due to self-harm that is typically higher than harm inflicted on Russia.[50]

This discussion suggests that tariff sanctions that result in blocked trade should be undertaken only after thorough analysis that weighs the benefits of decoupling against the significant economic costs of doing so.

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[48] We define the cut-off for inclusion at blocked-trade percentages of 95% and higher.

[49] Recall our discussion from Section 3, and Figure 2 in particular: With full decoupling, the United States enjoys no terms-of-trade gains (since no post-sanction imports are occurring) that could counterbalance the certain inefficiency losses that reduced import volumes cause to the U.S. economy. As a result, U.S. self-harm (suffered by consumers) in decoupled sectors is a given.

[50] Indeed, full decoupling is likely to cause only small (if any) welfare losses to Russia (columns (8) and (9) of Table 9). This is so since full decoupling is oftentimes the result of perfectly elastic (horizontal) Russian export supply curves facing the United States. A horizontal supply curve in a given sector implies that the United States is a "small" import market with no market power; Russian exporters are able to fully pass on the U.S. tariff increase to U.S. consumers (*see* "100%" entries in column (2)) or to export their goods elsewhere. Russian exporters experience no efficiency losses (rectangle **c** in Figure 2, above). U.S. consumers, however, are priced out of the market on account of excessive domestic price increases on goods imported from Russia, thus resulting in zero post-sanction imports and significant efficiency losses (rectangle **e** in Figure 2, above). For those product groups for which the Russian export supply curve is not fully horizontal and pass-through is not 100%, Russian welfare losses still tend to be quite small compared those suffered by U.S. consumers: Russian exporters experience no terms-of-trade losses (since there are no post-sanction imports occurring), which only leaves relatively minor efficiency losses from depressed export volumes.

Table 9: Sectors in which US sanctions result in fully or substantially blocked trade

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)
841221	Hydraulic power engines and motors, linear acting cylinders	6,031	100%	100%	0	0	-1,055	-17%	0	0%
442199	Articles of wood, n.e.s.	4,318	69%	100%	0	0	-483	-11%	-216	-5%
900791	Parts and accessories for cinematographic cameras, n.e.s.	1,075	100%	100%	0	0	-177	-16%	0	0%
950510	Christmas articles (excluding candles and electric lighting sets, natu ...	870	78%	100%	0	0	-118	-14%	-34	-4%
940610	Prefabricated buildings of wood, whether or not complete or already as ..	725	100%	100%	0	0	-117	-16%	0	0%
841290	Parts of non-electrical engines and motors, n.e.s.	521	100%	100%	0	0	-91	-17%	0	0%
841239	Pneumatic power engines and motors (excluding linear acting)	409	100%	100%	0	0	-72	-17%	0	0%
442191	Articles of bamboo, n.e.s.	383	69%	100%	0	0	-43	-11%	-19	-5%
293299	Heterocyclic compounds with oxygen hetero-atom[s] only (excl. compour	189	100%	100%	0	0	-30	-16%	0	0%
880220	Aeroplanes and other powered aircraft of an unladen weight <= 2.000 kg ..	158	1%	100%	0	0	0	0%	-27	-17%
340590	Glass or metal polishes, whether or not in the form of paper, wadding, ...	123	82%	100%	0	0	-18	-14%	-4	-3%
691310	Statuettes and other ornamental articles of porcelain or china, n.e.s. ...	96	100%	100%	0	0	-16	-17%	0	0%
841229	Hydraulic power engines and motors (excluding hydraulic turbines and w	95	100%	100%	0	0	-17	-17%	0	0%
950590	Festival, carnival or other entertainment articles, incl. conjuring tr ...	87	78%	100%	0	0	-12	-14%	-3	-4%
900220	Filters, optical, being parts of or fittings for instruments, apparatu ...	52	100%	100%	0	0	-9	-17%	0	0%
480610	Vegetable parchment, in rolls of a width > 36 cm or in square or recta ...	31	67%	100%	0	0	-4	-12%	-2	-6%
841231	Pneumatic power engines and motors, linear-acting, cylinders	29	100%	100%	0	0	-5	-17%	0	0%
701090	Carboys, bottles, flasks, jars, pots, phials and other containers, of ...	23	100%	100%	0	0	-4	-17%	0	0%
380120	Colloidal or semi-colloidal graphite	16	100%	100%	0	0	-3	-17%	0	0%
731100	Containers of iron or steel, for compressed or liquefied gas (excludin ...	13	100%	100%	0	0	-2	-17%	0	0%
293219	Heterocyclic compounds with oxygen hetero-atom[s] only, containing an	5	100%	100%	0	0	-1	-16%	0	0%
401220	Used pneumatic tyres of rubber	5	100%	100%	0	0	-1	-17%	0	0%
401290	Solid or cushion tyres, interchangeable tyre treads and tyre flaps, of ...	1	100%	99%	0	0	0	-17%	0	0%
710221	Industrial diamonds unworked or simply sawn, cleaved or bruted	608	100%	98%	4	0	-104	-17%	0	0%
283531	Sodium triphosphate sodium tripolyphosphate, whether or not chemicall	918	100%	98%	7	0	-151	-16%	0	0%
283522	Mono- or disodium phosphate	63	100%	98%	0	0	-10	-16%	0	0%
284390	Inorganic or organic compounds of precious metals, whether or not chem	150	100%	97%	2	0	-24	-16%	0	0%
281129	Inorganic oxygen compounds of non-metals (excluding diphosphorus pen	16	100%	96%	0	0	-3	-16%	0	0%
283620	Disodium carbonate	25	97%	96%	0	0	-4	-16%	0	-1%
291479	Halogenated, sulphonated, nitrated or nitrosated derivatives of ketone ...	5	99%	96%	0	0	-1	-16%	0	0%
	Subtotal (selected product groups)	**17,040**			**14**	**0**	**-2,575**		**-306**	

Observation 5: Target sectors for which the balance of harm to Russia and self-harm to the United States is unfavorable

As alluded to above, our analysis further shows that there are multiple product groups for which new U.S. tariff increases generate U.S. welfare losses exceed those inflicted upon Russia. Column (10) of Table 10 ranks all those sectors for which new tariff sanctions cause more self-harm to the United States than they inflict harm to Russia. These 20 sectors together affect $1.1 billion in 2021 trade (column (1)) and inflict a total of $46 million to the Russian economy (column (8)), but also cause welfare losses to the United States worth 116 million (resulting in a "cost share" of over 250%, or, in dollar terms, a negative difference of $70 million in the United States' disfavor; column (10)). Notable on this list of 20 sectors is product group HS 720712 ("Semi-finished products of iron or non-alloy steel"), for which tariff increases to 35% *ad valorem* by the United States will cause self-harm in excess of $100 million, while inflicting "only" $42 million in welfare losses to Russia.

The results contained in Table 10 again raise questions regarding the product scope of the U.S. sanctions package. It appears unwise – at least from a purely economic point of view – to target product groups that weaken the U.S. economy more than Russia's. We thus assume that the United States had weighty non-economic reasons that justified the inclusion of the sectors listed in that table.

Observation 6: Target sectors with zero or negligible harm to Russia

As a special case of the previous observation, we note that there are a considerable number of targeted product groups for which U.S. tariff action of any kind will cause zero, or negligible, economic harm to Russia. Table 11 lists target sectors for which Russia experiences welfare losses of less than $5,000 (*see* column (8)).[51]

As the table shows, low levels of harm to Russia are not necessarily a function of small pre-sanction trade values (as mentioned in footnote 51, Table 11 contains only sectors with more than $100,000 of affected trade). Rather, in the overwhelming majority of cases, the United States simply has *no* importer power vis-à-vis Russian exporters. Russian exporters can thus pass 100% (or close to 100%) of U.S. tariff increases on to U.S. consumers (*see* column (2)), which causes economic pain uniquely in the United States, but not in Russia.[52] As columns (6) and (7) of Table 11 indicate, U.S. welfare losses in these particular sectors can easily exceed $1 million and reach almost 20% of total pre-sanction import values.

The results summarized in Table 11 thus similarly raise questions regarding the sectoral composition of the U.S. sanctions package, since Russia will simply not be affected by new U.S. sanctions on certain import sectors. It may be that the United States had important non-economic reasons that would warrant the inclusion of the sectors listed in that table. However, the fact that U.S. tariff increases harm the Russian economy only marginally would appear to impose a high strategic bar. Consequently, the United States may reconsider inclusion of these product groups into its sanction package.

[51] Table 11 only contains sectors with more than $100,000 of affected import value (column (1)), so as to keep the number of rows manageable.
[52] *See* footnote 50, above, for further explanations.

Table 10: Sectors in which balance of harm to Russia and self-harm to United States is unfavorable

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)	(10) Difference US-loss to Russia-loss
720712	Semi-finished products of iron or non-alloy steel containing, by weigh ...	926,528	77%	89%	33,020	8,326	-102,441	-11%	-41,734	-5%	-60,707
440712	Fir Abies spp. and spruce Picea spp. sawn or chipped lengthwise, slice ...	39,893	100%	50%	6,948	0	-3,508	-9%	0	0%	-3,508
440711	Pine Pinus spp. sawn or chipped lengthwise, sliced or peeled, whether ...	13,156	100%	50%	2,291	0	-1,157	-9%	0	0%	-1,157
841221	Hydraulic power engines and motors, linear acting cylinders	6,031	100%	100%	0	0	-1,055	-17%	0	0%	-1,055
291612	Esters of acrylic acid	9,618	100%	72%	938	0	-1,037	-11%	0	0%	-1,037
291611	Acrylic acid and its salts	6,719	100%	74%	604	0	-769	-11%	0	0%	-769
442199	Articles of wood, n.e.s.	4,318	69%	100%	0	0	-483	-11%	-216	-5%	-267
722490	Semi-finished products of alloy steel other than stainless	61,794	72%	73%	5,198	1,621	-4,080	-7%	-3,852	-6%	-228
900791	Parts and accessories for cinematographic cameras, n.e.s.	1,075	100%	100%	0	0	-177	-16%	0	0%	-177
283531	Sodium triphosphate sodium tripolyphosphate, whether or not chemicall	918	100%	98%	7	0	-151	-16%	0	0%	-151
940610	Prefabricated buildings of wood, whether or not complete or already as ...	725	100%	100%	0	0	-117	-16%	0	0%	-117
710221	Industrial diamonds unworked or simply sawn, cleaved or bruted	608	100%	98%	4	0	-104	-17%	0	0%	-104
480419	Kraftliner, uncoated, in rolls of a width > 36 cm (excluding unbleache ...	4,459	72%	79%	298	91	-353	-8%	-262	-6%	-91
841290	Parts of non-electrical engines and motors, n.e.s.	521	100%	100%	0	0	-91	-17%	0	0%	-91
950510	Christmas articles (excluding candles and electric lighting sets, natu ...	870	78%	100%	0	0	-118	-14%	-34	-4%	-85
440796	Birch Betula spp., sawn or chipped lengthwise, sliced or peeled, wheth ...	961	100%	50%	167	0	-84	-9%	0	0%	-84
720421	Waste and scrap of stainless steel (excluding radioactive, and waste a ...	2,787	75%	76%	212	58	-221	-8%	-151	-5%	-70
870110	Pedestrian-controlled agricultural tractors and similar tractors for i ...	2,213	80%	70%	214	47	-169	-8%	-103	-5%	-66
940490	Articles of bedding and similar furnishing, fitted with springs or stu ...	539	79%	91%	16	3	-51	-10%	-17	-3%	-34
720449	Waste and scrap of iron or steel (excluding slag, scale and other wast ...	608	75%	76%	46	13	-48	-8%	-33	-5%	-15
	Subtotal (selected product groups)	**1,084,341**			**49,962**	**10,160**	**-116,217**		**-46,401**		**-69,816**

Table 11: Sectors with zero or negligible harm to Russia

HS 6-digit code	HS6 description	(1) Trade affected (US imports from Russia) (in $ '000)	(2) Pass-through to US consumers (in %)	(3) Blocked trade/ Decoupling (in % of pre-sanction imports)	(4) Tariff revenue (based on 35% tariff; in $ '000)	(5) Terms-of-trade gains to US (in $ '000)	(6) Welfare effect on US (in $ '000)	(7) Welfare effect on US (in % of pre-sanction imports)	(8) Welfare loss for Russia (in $ '000)	(9) Welfare loss for Russia (in % of pre-sanction imports)
900791	Parts and accessories for cinematographic cameras, n.e.s.	1,075	100%	100%	0	0	-177	-16%	0	0%
293299	Heterocyclic compounds with oxygen hetero-atom[s] only (excl. compour	189	100%	100%	0	0	-30	-16%	0	0%
382499	Chemical products and preparations of the chemical or allied industrie ...	452	100%	94%	10	0	-67	-15%	0	0%
940610	Prefabricated buildings of wood, whether or not complete or already as ...	725	100%	100%	0	0	-117	-16%	0	0%
440719	Coniferous wood sawn or chipped lengthwise, sliced or peeled, whether	334	100%	50%	58	0	-29	-9%	0	0%
841239	Pneumatic power engines and motors (excluding linear acting)	409	100%	100%	0	0	-72	-17%	0	0%
841290	Parts of non-electrical engines and motors, n.e.s.	521	100%	100%	0	0	-91	-17%	0	0%
440796	Birch Betula spp., sawn or chipped lengthwise, sliced or peeled, wheth ...	961	100%	50%	167	0	-84	-9%	0	0%
841221	Hydraulic power engines and motors, linear acting cylinders	6,031	100%	100%	0	0	-1,055	-17%	0	0%
440711	Pine Pinus spp. sawn or chipped lengthwise, sliced or peeled, whether ...	13,156	100%	50%	2,291	0	-1,157	-9%	0	0%
440712	Fir Abies spp. and spruce Picea spp. sawn or chipped lengthwise, slice ...	39,893	100%	50%	6,948	0	-3,508	-9%	0	0%
710221	Industrial diamonds unworked or simply sawn, cleaved or bruted	608	100%	98%	4	0	-104	-17%	0	0%
284390	Inorganic or organic compounds of precious metals, whether or not chem	150	100%	97%	2	0	-24	-16%	0	0%
283531	Sodium triphosphate sodium tripolyphosphate, whether or not chemicall	918	100%	98%	7	0	-151	-16%	0	0%
291614	Esters of methacrylic acid	422	100%	80%	30	0	-56	-13%	0	0%
291611	Acrylic acid and its salts	6,719	100%	74%	604	0	-769	-11%	0	0%
291612	Esters of acrylic acid	9,618	100%	72%	938	0	-1,037	-11%	0	0%
283660	Barium carbonate	250	97%	93%	6	0	-37	-15%	-1	-1%
400300	Reclaimed rubber in primary forms or in plates, sheets or strip	279	95%	80%	19	1	-36	-13%	-3	-1%
340590	Glass or metal polishes, whether or not in the form of paper, wadding, ...	123	82%	100%	0	0	-18	-14%	-4	-3%
	Subtotal (selected product groups)	**82,833**			**11,084**	**1**	**-8,620**		**-8**	

5. Concluding remarks

Following the United States' revocation of Russia's MFN status and agreement by the G7 to coordinate further sanctions, the United States has begun imposing 35% *ad valorem* tariffs on 570 product groups from Russia – a measure that affects Russian imports well in excess of $2 billion. The declared objectives of these tariff increases are to impose steep economic costs on Russia, minimizing costs to U.S. consumers, and eventually disbursing revenues collected from these new tariffs as financial aid to Ukraine.

We estimated the overall effects of the new U.S. tariff sanctions and found that they can reduce annual welfare in Russia by $184 million and generate tariff revenues of $205 million per year. While these amounts are substantial, they also come at a considerably high cost of $97 million per year to the U.S. economy.

Analyzing next a scenario in which the EU applies "mirror" sanctions of the same scale and scope as the United States', we find that the EU could do significantly more harm to Russia's economy ($575 million per year), and at a much lower cost to the EU economy ($82 million per year). Additionally, the EU could collect disbursable tariff revenues of up to $536 million annually. Thus, combined U.S./EU sanctions would significantly amplify the desired economic damage to Russia – an outcome that would be consistent with the objectives mentioned in the communiqués following the last G7 Summit.

However, rather than merely adopting the United States' selection of target sectors and tariff levels, the EU could design its own sanction package that is finetuned to the realities of its economy. With the help of an evaluation tool similar to the one presented in this paper, the EU (or any other sanctioning Ally, for that matter) could avoid some of the weaknesses of the new U.S. tariff sanctions, and pinpoint those import sectors for which the trade-off between maximizing harm to Russia and minimizing self-harm is optimal for EU Member States

Indeed, our sectoral analysis in Section 3.3 shows that the United States' choice of target sectors produces mixed results when benchmarked against the stated economic objectives. We identified several features of the United States' sanctions package that contribute to the objectives pursued:

- Rather than just going after the big and economically important import sectors – which risks exposing the United States to significant overall welfare costs – the United States adopted a "long-tail approach" that targets hundreds of product groups. For many target sectors individually importation from Russia may be less significant to the U.S. economy, but collectively they cause substantial additional economic damage to the Russian economy, while at the same time achieving a balance of harm that is more favorable compared to targeting a few big sectors. However, as discussed in Observation 1 of Section 3.3, not every product group in the "long tail" is equally suited as a target sector (*see also* below).
- The U.S. sanction package further covers dozens of product groups whose inclusion causes particularly large welfare losses to Russia. These target sectors together affect more than $2 billion of U.S. imports and inflict upwards of $170 million in harm to the Russian economy. When appropriately weighted against self-harm to the U.S. economy, including a subset of these sectors appear to be particularly apt.

- The sanction package selected by the United States includes numerous sectors for which the U.S. tariff increases generate particularly high welfare *gains* to the U.S. economy. We estimate that the inclusion of these sectors achieves U.S. welfare gains of more than $35 million. Since new tariffs in these sectors also causes economic damage of nearly $90 million to the Russian economy, as well as substantial tariff revenues of nearly $95 million, inclusion of these sectors appears to be especially effective.
- In a number of target sectors application of 35% tariffs by the United States will lead to a complete or near-complete disruption of import activity from Russia. This brings with it certain policy advantages from the U.S. perspective (*e.g.*, reduced dependency from Russian imports, or decoupling). However, blocked trade also entails significant economic costs – zero tariff revenues, as well as welfare losses to the U.S. economy that are almost always higher than harm inflicted to Russia. Thus, tariff sanctions that result in blocked trade should be undertaken only after thorough analysis that carefully trades off the benefits of decoupling against the considerable economic costs of doing so.

We have also identified features of the U.S. sanctions package that raise questions about its effectiveness for certain sectors:

- More than half of the product groups targeted by the United States involve sectors for which (i) imports from Russia are insignificant to the U.S. economy and (ii) Russian exports to the United States are insignificant for the Russian economy. U.S. tariff increases on these sectors inflict only minor economic damages on Russia while at the same time causing nearly equivalent losses to the U.S. economy.
- The United States has also targeted multiple product groups for which tariff increases result in U.S. welfare losses that exceed those inflicted upon Russia. Notable on this list of 20 sectors is one product group ("Semi-finished products of iron or non-alloy steel") for which U.S. tariff increases cause self-harm in excess of $100 million to the U.S. economy, while inflicting "only" $42 million in welfare losses to Russia. It appears questionable – at least from a purely economic point of view – to target product groups that weaken the U.S. economy substantially more than Russia's.
- For a considerable number of targeted sectors U.S. tariff action of any kind causes *zero* economic harm to Russia, because the United States lacks any market power vis-à-vis Russian exporters. Exporters from Russia are therefore able to fully pass on higher tariff incidence to U.S. customers. From a purely economic perspective, it seems questionable to include sectors for which higher tariffs result in no economic harm to Russia whatsoever.

Considering these mixed results from a purely economic angle we believe there is potential for modification of the current U.S. sanction package so as to avoid the pitfalls summarized above. Such makeover could be conducted in close coordination with U.S. Allies. In any event, other sanctioning Allies, such as the EU, could separately apply analytical models such as ours, and assess in detail whether mirror sanctions are effective. If this not the case, Allies may consider designing alternative sanction portfolios that are better suited to their respective economies.

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