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## Article

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# The Economic Effects of Potential EU Tariff Sanctions on Russia – A Sectoral Approach

As part of its sanctions regime, the United States recently announced the imposition of punitive import tariffs on 570 product groups from Russia. The European Union may follow suit and enact sanctions on Russia that mirror the US sanctions in scale and scope. Using a sector-specific partial-equilibrium model, we quantify the impact of such mirror sanctions. We find they would inflict on Russia welfare losses of at least \$996 million per year – at an overall cost of \$150 million to EU consumers. Breaking down these totals in a sectoral analysis, we find that mirroring the US action would produce mixed results from the EU's perspective. On the one hand, tariff sanctions cover a number of sectors whose inclusion would inflict particularly large welfare losses for Russia and/or high welfare gains for the EU. On the other hand, mirror sanctions would bring significant inefficiencies for the EU. For example, in 72 sectors, higher tariffs would inflict greater harm on the EU than on the Russian economy, causing EU losses in excess of \$560 million. Thus, consistent with the spirit of international coordination and alignment, the EU may consider adjusting the suite of tariff sanctions rather than simply adopting the US package.

At the 2022 G7 Summit in Germany, leaders agreed to “coordinate” and “align” actions involving extra tariff measures on imports from Russia in response to Russia's invasion of Ukraine. G7 members pledged to “continue our targeted use of coordinated sanctions for as long as necessary, acting in unison at every stage” (G7 Research

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Group, 2022a).<sup>1</sup> During the G7 Summit, the United States announced plans to significantly increase tariff rates on hundreds of Russian products (White House, 2022). Effective 27 July 2022, Presidential Proclamation 10420 raised applicable tariffs on 570 product groups<sup>2</sup> imported from Russia to 35% *ad valorem* (Federal Register, 2022). Given the stated intention of “alignment”, “acting in unison at every stage” and “unprecedented coordinated sanction measures” pervading the G7 Summit (G7 2022a; 2022b), it appears likely that other countries will follow the United States' lead and soon impose steep tariff increases on Russian import products.

This paper engages in a thought experiment. We examine the effects of the European Union, as one of the United States' closest allies on Russia sanctions, aligning itself with the United States not just by enacting similar tariff measures, but by imposing “mirror” sanctions, i.e. applying the same 35% *ad valorem* tariff on the same 570 prod-

<sup>1</sup> This proposed action by G7 is 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 (n.d.).

<sup>2</sup> In this paper, we use the terms “product group” and “sector” interchangeably.

uct groups.<sup>3</sup> Using a sector-by-sector partial-equilibrium framework, we quantify the economic effects that such mirror sanctions would have on the Russian economy, as well as on the EU economy itself.<sup>4</sup> We then assess the sanctions list at the product level and evaluate the consequences of including certain sectors in the EU mirror sanctions package. This paper is purely descriptive in that we analyse tariff increases on the same 570 product groups initially selected by the United States. Our results should not be read as recommendations on adding or dropping certain product groups, or as suggestions for designing an alternative EU retaliation package, which always involves additional, non-economic considerations.<sup>5</sup>

### Methodology of the model and its application to potential mirror sanctions by the EU

We apply a proprietary model and software designed by the Economic Analysis Unit of Sidley Austin LLP.<sup>6</sup> The tool consists of a series of bilateral partial-equilibrium models between (groups of) exporters and (groups of) importers. 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. The model also considers exporter and importer market power (the “large-country” assumption), thus enabling us to quantify potential terms-of-trade gains for the sanctioning country.

For each product group included in the latest US tariff sanction package (and therefore in the hypothesised EU mirror sanctions), 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. The model is implemented by using 2021 trade flow data from the World Bank’s World Integrated Trade Solution System as the pre-sanction base-

line.<sup>7</sup> As usual for this class of models, the quality of the results is critically determined by the quality of the elasticity estimates. We use elasticity estimates for import demand and export supply compiled by Soderbery (2018), which are particularly comprehensive and also available for specific country pairs. Since Soderbery (2018) does not provide for elasticity estimates for the EU as a bloc, we apply estimates for Germany (as the largest EU economy and Russia’s largest European trading partner). This implies that economic effects on Russia reported in this paper are likely underestimated, while welfare losses (gains) to the EU are likely overestimated (underestimated).<sup>8</sup>

The following economic metrics are of particular interest to our analysis:

*Trade affected:* This metric describes the pre-sanction trade value that is impacted by the tariff increase. This metric is not an expression of economic effects per se, but it can be seen as an approximate measure of the economic relevance that a certain product group has both for the EU and for Russia.

*Blocked trade/decoupling:* This metric captures the import value (as a percentage of pre-sanction imports) that is interrupted as a result of the tariff increases. While it is not an expression of welfare effects, it is a useful metric to express the level of economic decoupling between the EU and Russia that occurs in a given product group as a result of the new tariff sanctions.

*Terms-of-trade gains:* Whenever the importer (EU) has a sufficient degree of market power vis-à-vis an exporter, the exporter (Russia) must absorb part of the tariff incidence by lowering its 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) to the same degree that it worsens the exporting country’s terms of trade. Multiplied with post-sanction import values, Russia’s terms-of-trade losses measure the reduced export value of those Russian sales that still occur after the tariff increase has gone into effect. Compared to the pre-sanction situation, export

3 We do not opine on the probability of the EU enacting import sanctions that exactly mirror in scale and scope those imposed by the United States. We take note of the above-quoted pledges to act “in unison at every stage” by the seven most powerful democracies (G7 Research Group, 2022a), but are not aware of any official statement as to what such coordination among the G7 and with other allies would look like in practice. In that sense, our assumption of the EU imposing mirror sanctions is one of many policy scenarios.

4 This paper does not engage in an analysis of the effects of the new US tariff sanctions on the US and Russian economies. The interested reader is referred to a previous paper by the authors on that issue (Latipov et al., 2022).

5 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. However, a discussion of political rationales is beyond the scope of this article.

6 Further details about the model, its methodology and data sources used are available in Latipov et al. (2022).

7 Our model treats the EU as one trade bloc. We appreciate that economic integration with Russia differs significantly between the individual EU members. Analyses on the country level are available, but not presented here.

8 The EU as an economic bloc is more powerful than Germany is on its own. Moreover, depending on the specific tariff lines, certain EU members may have more importer power than Germany. Consequently, EU members collectively constitute a larger and more powerful export region (from Russia’s perspective). Hence, Russian export supply elasticities vis-à-vis all EU members are likely steeper, and EU import demand elasticities vis-à-vis Russia flatter than Germany’s alone. Higher welfare losses to Russia, and higher welfare gains to the EU are then a likely consequence.

Table 1

**Total economic effects of tariff sanctions on Russia, the European Union and the United States**

	(1)	(2)	(3)	(4)	(5)	(6)
Ally imposing sanctions	Trade affected (ally's imports from Russia) (US \$1000)	Blocked trade/Decoupling (% of pre-sanction imports of affected product groups, weighted average)	Terms-of-trade gain to ally (US \$1000)	Tariff revenue (based on 35% tariff, US \$1000)	Welfare effect on ally (US \$1000)	Welfare loss for Russia (US \$1000)
EU	10,842,398	63	596,521	883,420	-150,111	-995,976
US	2,677,683	62	97,632	205,066	-97,701	-184,901
Total EU and US	13,520,081		694,153	1,088,486	-247,812	-1,180,877

Source: Authors' own calculation.

sales occur at a lower price. These “income effects” represent a pure net wealth transfer from Russia to the EU.

*Tariff revenue:* Tariff revenue is the tariff rate times the import value that still enters the ally's market after the sanction has been imposed.<sup>9</sup> One part of tariff revenues constitutes the share of tariff revenue paid by Russian exporters on account of its terms-of-trade losses (see previous paragraph), while another is a domestic net wealth transfer between consumers and the government of the sanctioning country.

*Total welfare effect to the EU:* Importer welfare effects are quantified as the difference between the potential terms-of-trade gains (described above) and efficiency losses suffered by the importing economy from inefficiently small import volumes. Total welfare effects to the EU can be positive or negative, depending on the market power of the EU for the specific import good, the importance of the good to the EU economy, and the size of the tariff hike.

*Total welfare losses to Russia:* Russia as the exporting country is certain to lose from higher EU import tariffs. Economic harm to Russia is calculated as the sum of terms-of-trade losses (described above) and efficiency losses stemming from inefficiently low export volumes and the unfavorable resource reallocation within the Russian economy that ensues.

Our model is operationalised on the sectoral level, either on the 4- or 6-digit aggregation level of the Harmonized System (HS). The US tariff increases (and thus the EU mirror sanctions) are, however, defined for 570 sectors at the HS 8-digit level. This requires us to aggregate the US target list to the HS 6-digit level. The aggregation reduces the number of distinguishable sectors from 570

to 393 individual product groups. The inevitable reduction in granularity likely makes our model over inclusive of reported trade flows, because the model may include product groups that would not be actually subject to the EU mirror sanctions on the HS 8-digit level, but are swept into a particular product group on the HS 6-digit level. Moreover, we lack reliable elasticity estimates for 83 further sectors and so are able to apply the model (i.e. quantify welfare results) to a total of 310 individual product groups.<sup>10</sup> Due to these missing observations (and despite the over-inclusiveness that results from the aggregation of target sectors to the HS 6-digit level mentioned above), the economic effects we report throughout will most likely underestimate the overall economic impacts of the new EU sanctions, discussed below.

## Results

Table 1 summarises the aggregate economic effects that would result from the application of the described tariff increases on hundreds of product groups. In total, EU mirror tariffs would affect trade worth \$10.8 billion per year (column (1)), which represents roughly 6.1% of all 2021 EU imports from Russia (or 20.4% of all non-energy imports). We estimate that these tariffs would reduce trade in affected sectors by 63% (column (2)). Moreover, they would cause annual terms-of-trade losses of \$596 million and welfare losses of \$996 million to Russia (columns (3) and (6), respectively). At the same time, they would cost EU consumers \$150 million (column (5)), and generate tariff revenue amounting to \$883 million per year (column (4)).

The second row of Table 1 summarises the economic effects of the original US tariff sanctions on the US and Russian economies. Overall, US tariff increases are estimated to affect trade worth \$2.68 billion per year, and reduce trade in the affected sectors by 62%. Furthermore, across

<sup>9</sup> Note that this metric measures total tariff revenues collected by the EU 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.

<sup>10</sup> The 83 “missing” product groups together accounted for pre-sanction (2021) imports from Russia worth \$666 million (or roughly 6% of all targeted imports).

Table 2  
Top ten economically significant sectors and their effects

HS 6-digit code	Description (abbreviated)	(1) Trade affected (US \$1000)	(2) Pass- through to EU consum- ers (%)	(3) Blocked trade (%)	(4) Tariff revenue (US \$1000)	(5) Terms-of- trade gains to EU (US \$1000)	(6) Welfare effect on EU (US \$1000)	(7) Welfare effect on EU (%)	(8) Welfare loss for Russia (US \$1000)	(9) Welfare loss for Russia (%)
720712	Semi-finished products of iron or non-alloy steel	3,092,181	71	100	0	0	-385,624	-12	-155,507	5
440712	Fir (Abies spp.) and spruce (Picea spp.)	845,467	33	32	153,482	133,573	117,647	14	-165,487	20
390210	Polypropylene, in primary forms	633,094	36	37	93,126	72,991	61,043	10	-94,295	15
401110	New pneumatic tyres, of rubber, of a kind used for motor cars	523,019	47	37	84,299	52,892	38,907	7	-68,452	13
440719	Coniferous wood	384,160	33	32	69,739	60,693	53,456	14	-75,193	20
440131	Wood pellets	297,461	72	74	24,497	7,585	-20,144	-7	-18,336	6
760612	Plates, sheets and strip, of aluminium alloys	273,314	55	43	37,870	19,418	10,622	4	-26,598	10
440711	Pine (Pinus spp.)	262,338	33	32	47,624	41,446	36,504	14	-51,349	20
400219	Styrene-butadiene rubber	216,592	80	98	1,186	258	-29,477	-14	-7,789	4
400220	Butadiene rubber BR	216,528	80	98	1,186	258	-29,468	-14	-7,786	4
Subtotal (top ten product groups)		6,744,154			513,007		-146,534		-670,792	
Total (all 570 product groups)		10,842,398			883,420		-150,111		-995,976	
Share (%)		62			58		98		67	

Note: The list contains top ten product groups in terms of trade affected.

Source: Authors' own calculation.

the universe of target sectors, new US sanctions will inflict Russian welfare losses amounting to \$185 million per year and cause welfare losses to the United States' own economy of \$98 million.

Comparing the economic impact generated by (actual) US versus (hypothetical) EU sanctions, we note that mirror sanctions by the EU would have more "bite", on account of the much larger trade relationship between Russia and the EU. Affected trade and welfare losses to Russia are nearly four times those of the US sanctions. The "cost share" of sanctions – the ratio of self-harm (column (5)) to harm on Russia (column (6)) – is nearly 53% for the United States, while it is only 15% for the EU.<sup>11</sup> In other words, the United States pays a significantly higher price, in relative terms, for its sanctions than the EU would pay.

The last row of Table 1 summarises the economic effects reported for the EU and the United States. Concerted action by the United States and the EU would inflict welfare losses to Russia of at least \$1.18 billion. Estimates for

combined harm on Russia must be seen as the lower end of the actual effects. First, the effects reported in Table 1 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), they would exercise even higher purchasing power vis-à-vis Russian exports.<sup>12</sup> 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 all 393 product groups on account of missing elasticity data. Evidently, results for any additional sector would only increase Russian welfare losses.<sup>13</sup>

Given that potential mirror sanctions by the EU would significantly boost the efficiency of US action, one might expect the United States to have a keen interest in convincing the EU to join it in imposing sanctions. But would following suit by imposing mirror sanctions also be in the EU's best interest? This question cannot be answered merely by looking at the aggregate effects presented in Table 1. Totals can mask important dynamics that occur

11 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 more preferable for the sanctioning ally.

12 For an explanation of underlying economic mechanisms, see footnote 8.

13 See footnote 10.

Table 3  
Sectors with high absolute welfare losses to Russia

HS 6-digit code	Description (abbreviated)	(1) Trade affected (US \$1000)	(2) Pass- through to EU con- sumers (%)	(3) Blocked trade (%)	(4) Tariff revenue (US \$1000)	(5) Terms-of- trade gains to EU (US \$1000)	(6) Welfare effect on EU (US \$1000)	(7) Welfare effect on EU (%)	(8) Welfare loss for Russia (US \$1000)	(9) Welfare loss for Russia (%)
440712	Fir (Abies spp.) and spruce (Picea spp.)	845,467	33	32	153,482	133,573	117,647	14	-165,487	20
720712	Semi-finished products of iron or non-alloy steel	3,092,181	71	100	0	0	-385,624	-12	-155,507	5
390210	Polypropylene, in primary forms	633,094	36	37	93,126	72,991	61,043	10	-94,295	15
440719	Coniferous wood	384,160	33	32	69,739	60,693	53,456	14	-75,193	20
401110	New pneumatic tyres, of rubber, of a kind used for motor cars	523,019	47	37	84,299	52,892	38,907	7	-68,452	13
440711	Pine (Pinus spp.)	262,338	33	32	47,624	41,446	36,504	14	-51,349	20
760612	Plates, sheets and strip, of aluminium alloys	273,314	55	43	37,870	19,418	10,622	4	-26,598	10
401120	New pneumatic tyres, of rubber, of a kind used for buses	163,556	47	37	26,362	16,540	12,167	7	-21,406	13
440910	Coniferous wood, incl. strips and friezes for parquet flooring	134,489	40	66	12,650	9,686	3,540	3	-19,055	14
440131	Wood pellets	297,461	72	74	24,497	7,585	-20,144	-7	-18,336	6
720421	Waste and scrap of stainless steel (excluding radioactive)	154,115	55	55	20,591	11,044	2,959	2	-17,701	11
760429	Bars, rods and solid profiles, of aluminium alloys	153,769	50	42	20,998	12,307	7,873	5	-16,825	11
392020	Plates, sheets, film, foil and strip, of non-cellular polymers of ethylene	91,693	33	40	12,704	10,464	8,725	10	-13,948	15
442199	Articles of wood	98,374	49	56	12,204	7,561	3,076	3	-12,276	12
291612	Esters of acrylic acid	133,953	61	44	19,063	8,291	3,157	2	-11,533	9
Subtotal (selected product groups)		7,240,983			635,207	464,493	-46,091		-767,962	

Note: The list contains product groups for which EU mirror tariff increases result in Russian welfare losses in excess of \$10 million.

Source: Authors' own calculation.

at the sectoral level. Below, we therefore present several observations resulting from our product-level analysis that can shed light on whether, and to what degree, the EU may wish to sign on to the United States' selected sanctions package.

*Comment 1: Top ten target sectors generate nearly two-thirds of total economic effects*

As a matter of first impression, we note that despite the fact that the sanctions package selected by the United States covers 570 product groups (which we model as 393 HS 6-digit line items), only a handful of targeted product groups generate the bulk of economic effects. Table 2 lists the top ten product groups in terms of "trade affected" by EU mirror sanctions. These ten sectors collectively would cover 62%, or \$6.7 billion, of all affected EU imports (column (1)), cause \$670 million, or 67%, of total Russian welfare losses (column (8)), and generate self-harm to the EU of \$147 mil-

lion, or 98% of total damages (column (6)).<sup>14</sup> The flipside of this observation then is that the remaining product groups together cover considerably fewer imports from Russia and generate smaller total effects than the ten sectors listed in Table 2.

*Comment 2: Certain target sectors inflict particularly high welfare losses on Russia*

The EU mirror sanction package contains various product groups, the inclusion of which causes particularly large welfare losses to Russia. Table 3 lists all those product groups for which EU mirror sanctions would inflict Rus-

<sup>14</sup> The high figure of 98% of total EU welfare losses can be explained by the fact that mirror tariffs on several other sectors induce welfare gains for the EU economy. See Comment 3.



Table 4  
Sectors with high relative welfare losses to Russia

HS 6-digit code	Description (abbreviated)	(1) Trade affected (US \$1000)	(2) Pass- through to EU con- sumers (%)	(3) Blocked trade (%)	(4) Tariff revenue (US \$1000)	(5) Terms-of- trade gains to EU (US \$1000)	(6) Welfare effect on EU (US \$1000)	(7) Welfare effect on EU (%)	(8) Welfare loss for Russia (US \$1000)	(9) Welfare loss for Russia (%)
846229	Bending, folding, straightening or flattening machines	659	0	0	146	219	219	33	-219	33
840690	Parts of steam and other vapour turbines	1,738	0	0	380	557	557	32	-558	32
491110	Trade advertising material, commercial catalogues and the like	373	19	14	81	91	89	24	-98	26
491191	Pictures, prints and photographs	619	19	14	134	151	148	24	-163	26
381519	Supported catalysts	1,556	14	9	328	388	386	25	-407	26
871680	Vehicles pushed or drawn by hand	2,108	22	20	417	440	425	20	-494	23
844391	Parts and accessories of printing machinery	370	25	39	59	60	54	15	-79	21
490191	Dictionaries and encyclopaedias, and serial instalments thereof	194	24	41	29	31	27	14	-41	21
490110	Printed books, brochures and similar printed matter, in single sheets	735	24	41	111	116	103	14	-156	21
490199	Printed books, brochures and similar printed matter (excluding those in single sheets)	14,361	24	41	2,164	2,259	2,015	14	-3,051	21
846693	Parts and accessories for machine tools for working metal	2,081	25	42	309	309	272	13	-419	20
950510	Christmas articles	495	33	24	98	85	78	16	-98	20
870110	Pedestrian-controlled agricultural tractors	755	29	27	136	126	116	15	-149	20
440711	Pine ( <i>Pinus</i> spp.)	262,338	33	32	47,624	41,446	36,504	14	-51,349	20
440791	Oak ( <i>Quercus</i> spp.)	15,088	33	32	2,739	2,384	2,099	14	-2,953	20
440712	Fir ( <i>Abies</i> spp.) and spruce ( <i>Picea</i> spp.)	845,467	33	32	153,482	133,573	117,647	14	-165,487	20
440719	Coniferous wood	384,160	33	32	69,739	60,693	53,456	14	-75,193	20
Subtotal (selected product groups)		1,533,097			277,975	242,928	214,197		-300,915	

Note: The list contains product groups for which EU mirror sanctions result in Russian welfare losses in excess of 20% of pre-sanction imports.

Source: Authors' own calculation.

sian welfare losses in excess of \$10 million.<sup>15</sup> These sectors together affect \$7.2 billion in 2021 trade (column (1)) and cause losses of \$768 million to the Russian economy (column (8)).<sup>16</sup> At the same time, mirror tariffs on these products cost the EU economy \$46 million (column (6)). This results in a highly favorable EU cost share of 6%.

<sup>15</sup> This threshold of \$10 million in Russian welfare losses is somewhat arbitrary, as are other thresholds introduced below. Their selection is mainly driven by our intention to keep the number of rows in the tables manageable. A Data Appendix, which is available from the authors upon request, contains a full set of sectors and economic effects.

<sup>16</sup> Note that this list contains some product groups whose inclusion may be seen as problematic (see Comments 4 to 7). Note also that there is significant overlap between this list and that in Table 5 (sectors in which the EU generated particularly high welfare gains).

Table 4 contains all product groups for which EU mirror tariffs cause high *relative* welfare losses to the Russian economy, which we define as losses in excess of 20% of pre-sanction imports to the EU. While nearly half of the product groups listed in Table 4 concern small import volumes of less than \$1 million (column (1)), total Russian welfare losses for these products amount to a sizable total of \$301 million (column (8)). Including these sectors even yields total welfare gains for the EU of \$214 million (see column (6)).

*Comment 3: Certain target sectors generate positive welfare effects for the EU*

Indeed, the EU mirror sanction package includes numerous sectors for which tariff increases result in substantial welfare

Table 5  
Sectors with high absolute welfare gains for the EU

HS 6-digit code	Description (abbreviated)	(1) Trade affected (US \$1000)	(2) Pass- through to EU con- sumers (%)	(3) Blocked trade (%)	(4) Tariff revenue (US \$1000)	(5) Terms-of- trade gains to EU (US \$1000)	(6) Welfare effect on EU (US \$1000)	(7) Welfare effect on EU (%)	(8) Welfare loss for Russia (US \$1000)	(9) Welfare loss for Russia (%)
440712	Fir (Abies spp.) and spruce (Picea spp.)	845,467	33	32	153,482	133,573	117,647	14	-165,487	20
390210	Polypropylene, in primary forms	633,094	36	37	93,126	72,991	61,043	10	-94,295	15
440719	Coniferous wood	384,160	33	32	69,739	60,693	53,456	14	-75,193	20
401110	New pneumatic tyres, of rubber, of a kind used for motor cars	523,019	47	37	84,299	52,892	38,907	7	-68,452	13
440711	Pine (Pinus spp.)	262,338	33	32	47,624	41,446	36,504	14	-51,349	20
401120	New pneumatic tyres, of rubber, of a kind used for buses	163,556	47	37	26,362	16,540	12,167	7	-21,406	13
760612	Plates, sheets and strip, of aluminium alloys	273,314	55	43	37,870	19,418	10,622	4	-26,598	10
392020	Plates, sheets, film, foil and strip, of non-cellular polymers of ethylene	91,693	33	40	12,704	10,464	8,725	10	-13,948	15
760429	Bars, rods and solid profiles, of aluminium alloys	153,769	50	42	20,998	12,307	7,873	5	-16,825	11
440796	Birch (Betula spp.)	45,490	33	32	8,214	7,099	6,281	14	-8,739	19
440890	Sheets for veneering	35,673	35	29	6,429	5,241	4,643	13	-6,329	18
854430	Ignition wiring sets and other wiring sets for vehicles, aircraft or ships	36,773	34	31	6,329	5,220	4,609	13	-6,382	17
Subtotal (selected product groups)		3,448,346			567,174	437,884	362,478		-555,003	

Note: The list contains top ten product groups in terms of welfare gains for the EU.

Source: Authors' own calculation.

gains to the EU economy. Welfare gains to the EU economy emerge in those sectors in which (i) the EU enjoys market power vis-à-vis Russia (reflected by low levels of pass-through; column (2)), and (ii) pre-sanction most-favoured-nation tariffs that were set at inefficiently low levels as far as Russian imports are concerned. Tariff increases are then economically beneficial, because the EU can shift much of the economic costs of tariff increases on Russian exporters via terms-of-trade effects.<sup>17</sup> Table 5 lists the top ten product groups for which EU mirror sanctions result in economic gains (column (6)). These product lines affect imports worth \$3.45 billion and generate welfare gains to the EU economy of \$362 million, as well as Russian welfare losses of roughly \$555 million.

*Comment 4: Mirror sanctions would result in blocked trade for 19 sectors*

Another interesting feature of the EU mirror sanctions is that the application of a 35% tariff would lead to a complete

interruption of import activity from Russia ("blocked trade") in a number of sectors (Table 6, column (3)). The 19 relevant product groups together affect an amount of \$3.16 billion in EU imports (column (1)). Notable on this list of sectors is one product group (HS 720712 Semi-finished products of iron or non-alloy steel) for which imposition of EU mirror sanctions would cut off imports worth \$3.09 billion.

If achieving a decoupling of the EU economy from Russian imports were one of the policy objectives pursued by EU policymakers (possibly with the aim of reducing dependency from Russian sources), then the inclusion of these 19 sectors could make sense. However, as Table 6 illustrates, such decoupling comes at a steep economic cost to the EU, resulting in significant absolute welfare losses of \$397 million (column (6)). At the same time, decoupling also generates relatively high welfare losses (i.e. relative to those in Russia; columns (8) and (9) of Table 6). Full decoupling often results from perfectly elastic (horizontal) Russian export supply curves facing the EU. A horizontal supply curve in a given sector implies that the EU is a "small" import market with no mar-

<sup>17</sup> This, of course, is the application of the "optimal tariff" theory first espoused by Johnson (1953).



Table 6  
Sectors in which EU sanctions result in blocked trade

HS 6-digit code	Description (abbreviated)	(1) Trade affected (US \$1000)	(2) Pass- through to EU con- sumers (%)	(3) Blocked trade (%)	(4) Tariff revenue (US \$1000)	(5) Terms-of- trade gains to EU (US \$1000)	(6) Welfare effect on EU (US \$1000)	(7) Welfare effect on EU (%)	(8) Welfare loss for Russia (US \$1000)	(9) Welfare loss for Russia (%)
720712	Semi-finished products of iron or non-alloy steel	3,092,181	71	100	0	0	-385,624	-12	-155,507	5
680610	Slag-wool, rock-wool and similar mineral wools	27,182	100	100	0	0	-4,757	-17	0	0
890399	Outboard motorboats, for pleasure or sports	13,332	100	100	0	0	-2,200	-16	0	0
731029	Tanks, casks, drums, cans, boxes	9,790	100	100	0	0	-1,581	-16	0	0
680620	Exfoliated vermiculite, expanded clays, and similar expanded mineral materials	4,999	100	100	0	0	-875	-17	0	0
681099	Articles of cement, concrete or artificial stone	4,494	100	100	0	0	-748	-17	0	0
930630	Cartridges for smooth-barrelled shotguns, revolvers and pistols	2,613	100	100	0	0	-426	-16	0	0
392490	Household articles and toilet articles, of plastics	2,228	100	100	0	0	-317	-14	0	0
731010	Tanks, casks, drums, cans, boxes and similar containers, of iron or steel	1,940	100	100	0	0	-313	-16	0	0
480610	Vegetable parchment	1,834	100	100	0	0	-321	-17	0	0
430219	Tanned or dressed furskins	551	100	100	0	0	-93	-17	0	0
400811	Plates, sheets and strip of cellular rubber	275	100	100	0	0	-44	-16	0	0
293299	Heterocyclic compounds with oxygen hetero-atom[s] only	237	65	100	0	0	-22	-9	-12	5
870310	Vehicles for the transport of persons on snow; golf cars	209	75	100	0	0	-22	-10	-7	3
293219	Heterocyclic compounds with oxygen hetero-atom[s] only	95	65	100	0	0	-9	-9	-5	5
680221	Marble, travertine and alabaster articles thereof, simply cut	25	100	100	0	0	-4	-17	0	0
680291	Marble, travertine and alabaster, in any form (excluding tiles)	20	100	100	0	0	-3	-17	0	0
930621	Cartridges for smooth-barrelled shotguns	11	100	100	0	0	-2	-16	0	0
870600	Chassis fitted with engines, for tractors, motor vehicles	9	7	100	0	0	0	-1	-1	12
Subtotal (selected product groups)		3,162,025			-	-	-397,361		-155,532	

Note: The list contains product groups for which EU mirror sanctions result in full decoupling (100% blocked trade).

Source: Authors' own calculation.

ket power. This enables Russian exporters to fully pass on the EU tariff increase to EU consumers (see "100%" entries in column (2) of Table 6), or to export their goods elsewhere. Russian exporters experience no efficiency losses. EU consumers, on the other hand, are priced out of the market, thus resulting in zero post-sanction imports (and thus zero tariff revenues for EU members), coupled with significant efficiency losses to EU consum-

ers. This results in a highly unfavorable EU cost share of 255% across the 19 sectors at issue.

*Comment 5: Targeting economically insignificant sectors produces negligible results*

As mentioned in Comment 1, the hypothetical EU mirror sanctions contain hundreds of product groups for which

Table 7

**Sectors in which balance of harm to Russia and self-harm to the EU is unfavorable**

HS 6-digit code	Description (abbreviated)	(1) Trade affected (US \$1000)	(2) Pass- through to EU con- sumers (%)	(3) Blocked trade (%)	(4) Tariff revenue (US \$1000)	(5) Terms-of- trade gains to EU (US \$1000)	(6) Welfare effect on EU (US \$1000)	(7) Welfare effect on EU (%)	(8) Welfare loss for Russia (US \$1000)	(9) Welfare loss for Russia (%)	(10) Differ- ence EU- loss to Russia- loss
720712	Semi-finished products of iron or non-alloy steel	3,092,181	71	100	0	0	-385,624	-12	-155,507	5	-230,117
400219	Styrene-butadiene rubber	216,592	80	98	1,186	258	-29,477	-14	-7,789	4	-21,688
400220	Butadiene rubber	216,528	80	98	1,186	258	-29,468	-14	-7,786	4	-21,682
400239	Halo-isobutene-isoprene rubber CIIR or BIIR	170,170	80	98	932	203	-23,159	-14	-6,119	4	-17,040
680610	Slag-wool, rock-wool and similar mineral wools	27,182	100	100	0	0	-4,757	-17	0	0	-4,757
870829	Parts and accessories of bodies for tractors, motor vehicles	32,612	100	86	1,450	0	-4,363	-13	0	0	-4,363
841221	Hydraulic power engines and motors, linear acting cylinders	24,424	100	97	226	0	-3,832	-16	0	0	-3,832
760511	Wire of non-alloy aluminium	182,993	81	65	16,550	3,331	-9,965	-5	-6,463	4	-3,502
400259	Acrylonitrile-butadiene rubber	31,778	80	98	174	38	-4,325	-14	-1,143	4	-3,182
441899	Builders' joinery and carpentry, of wood	70,172	69	92	1,690	585	-7,249	-10	-4,084	6	-3,165
870323	Motor cars and other motor vehicles principally designed for the transport of persons	50,808	75	94	686	179	-4,337	-9	-1,649	3	-2,689
901420	Instruments and appliances for aeronautical or space navigation	55,639	77	80	3,602	902	-5,086	-9	-2,691	5	-2,395
701090	Carboys, bottles, flasks, jars, pots, phials	87,578	84	62	9,373	1,599	-5,279	-6	-2,931	3	-2,348
870899	Parts and accessories, for tractors, motor vehicles	16,494	100	86	721	0	-2,221	-13	0	0	-2,221
890399	Outboard motorboats, for pleasure or sports	13,332	100	100	0	0	-2,200	-16	0	0	-2,200
400231	Isobutylene isoprene rubber	21,950	80	98	120	26	-2,987	-14	-789	4	-2,198
780110	Unwrought lead, refined	29,710	82	80	1,817	337	-2,850	-10	-1,014	3	-1,836
440131	Wood pellets	297,461	72	74	24,497	7,585	-20,144	-7	-18,336	6	-1,809
731029	Tanks, casks, drums, cans, boxes	9,790	100	100	0	0	-1,581	-16	0	0	-1,581
870870	Road wheels and parts and accessories thereof, for tractors, motor vehicles	9,379	100	86	417	0	-1,255	-13	0	0	-1,255
Subtotal (selected product groups)		4,656,773			64,626	15,300	-550,159		-216,302		-333,857

Note: The list contains product groups for which EU mirror sanctions result in excess welfare losses of more than \$1 million.

Source: Authors' own calculation.

importation from Russia may be less significant to the EU economy. Indeed, of the 393 sectors that our model can distinguish, 116 feature pre-sanction imports from Russia into the EU of less than \$500,000. In relative terms, for 268 product groups, Russian imports account for less than 3% of total EU imports.

There certainly may be valid reasons for including sectors for which Russia is a minor import source. A key motivation for including dozens of product groups that are economically insignificant to the EU is most likely that, while Russia's share in EU imports is negligible, the EU still constitutes an important destination for Russian ex-

Table 8  
Sectors with zero or negligible harm to Russia

HS 6-digit code	Description (abbreviated)	(1) Trade affected (US \$1000)	(2) Pass- through to EU con- sumers (%)	(3) Blocked trade (%)	(4) Tariff revenue (US \$1000)	(5) Terms-of- trade gains to EU (US \$1000)	(6) Welfare effect on EU (US \$1000)	(7) Welfare effect on EU (%)	(8) Welfare loss for Russia (US \$1000)	(9) Welfare loss for Russia (%)
870829	Parts and accessories of bodies for tractors, motor vehicles	32,612	100	86	1,450	0	-4,363	-13	0	0
680610	Slag-wool, rock-wool and similar mineral wools	27,182	100	100	0	0	-4,757	-17	0	0
841221	Hydraulic power engines and motors, linear acting cylinders	24,424	100	97	226	0	-3,832	-16	0	0
870899	Parts and accessories, for tractors, motor vehicles	16,494	100	86	721	0	-2,221	-13	0	0
890399	Outboard motorboats, for pleasure or sports	13,332	100	100	0	0	-2,200	-16	0	0
731029	Tanks, casks, drums, cans, boxes	9,790	100	100	0	0	-1,581	-16	0	0
870870	Road wheels and parts and accessories thereof, for tractors, motor vehicles	9,379	100	86	417	0	-1,255	-13	0	0
870830	Brakes and servo-brakes and their parts, for tractors, motor vehicles	7,005	100	85	321	0	-925	-13	0	0
281129	Inorganic oxygen compounds of non-metals	5,387	100	91	148	0	-732	-14	0	0
680620	Exfoliated vermiculite, expanded clays and similar expanded mineral materials	4,999	100	100	0	0	-875	-17	0	0
681099	Articles of cement, concrete or artificial stone, whether or not reinforced	4,494	100	100	0	0	-748	-17	0	0
292690	Nitrile-function compounds	3,966	100	83	188	0	-475	-12	0	0
870840	Gear boxes and parts thereof, for tractors, motor vehicles	3,832	100	85	173	0	-509	-13	0	0
870810	Bumpers and parts thereof for tractors, motor vehicles	3,816	100	86	170	0	-510	-13	0	0
841290	Parts of non-electrical engines and motors	3,749	100	98	24	0	-599	-16	0	0
930630	Cartridges for smooth-barrelled shot-guns, revolvers and pistols	2,613	100	100	0	0	-426	-16	0	0
870880	Suspension systems and parts thereof, incl. shock-absorbers	2,371	100	86	105	0	-317	-13	0	0
392490	Household articles and toilet articles, of plastics	2,228	100	100	0	0	-317	-14	0	0
870892	Silencers mufflers and exhaust pipes, for tractors, motor vehicles ...	2,040	100	85	92	0	-271	-13	0	0
731010	Tanks, casks, drums, cans, boxes and similar containers, of iron or steel	1,940	100	100	0	0	-313	-16	0	0
841229	Hydraulic power engines and motors	1,842	100	93	42	0	-263	-14	0	0
480610	Vegetable parchment	1,834	100	100	0	0	-321	-17	0	0
870850	Drive-axles with differential	1,779	100	85	82	0	-235	-13	0	0
820559	Hand tools, incl. glaziers' diamonds, of base metal	1,142	100	85	56	0	-154	-13	0	0
Subtotal (selected product groups)		188,250			4,214	0	-28,198		0	

Note: The list contains import sectors for which affected trade exceeds the threshold of \$1 million.

Source: Authors' own calculation.

ports.<sup>18</sup> Yet, there is one subgroup for which inclusion is not immediately obvious. This subgroup is composed of

those product groups for which imports from Russia are insignificant to the EU economy *and* Russian exports to the EU are insignificant for the Russian economy.<sup>19</sup> Of the

18 Indeed, this is the case for at least 81 sectors, for which the Russian share in all EU imports is insignificant (smaller than 3%), but the EU's share in Russian exports is considerable (equal or larger than 20%).

19 We define economically insignificant as shares of less than 3% of total imports and exports, respectively.

393 sectors that our model can distinguish, 62 fall into this category. EU mirror tariffs on these 62 sectors inflict only minute overall economic damage of roughly \$6.6 million to Russia, with an average economic harm of \$107,000 per tariff line. Setting aside the fact that for five of these 62 sectors, EU welfare losses exceed harm to Russia (more on that issue in Comment 6 below),<sup>20</sup> it would appear that the administrative effort of implementing and enforcing higher tariffs on these 62 sectors may easily outweigh the overall welfare gain of \$1.9 million generated by EU mirror sanctions on these sectors.

*Comment 6: Mirror sanctions on dozens of sectors would inflict more harm on the EU itself than on Russia*

As previously alluded to, EU mirror sanctions on multiple product groups would generate EU welfare losses that exceed those inflicted on Russia. Table 7 lists 20 sectors for which mirror sanctions inflict more self-harm to the EU than they inflict harm to Russia, and for which this difference exceeds \$1 million (see column (10)).<sup>21</sup> These sectors together affect \$4.66 billion in 2021 trade (column (1)). Tariff increases in these sectors would inflict a total of \$216 million welfare loss to the Russian economy (column (8)) yet cause welfare losses to the EU worth \$550 million. Notable on this list is again product group HS 720712 (Semi-finished products of iron or non-alloy steel), for which the EU's tariff increases to 35% would entail self-harm in excess of \$386 million, while causing "only" \$156 million in welfare losses to Russia, for a highly unfavorable cost share of 248%.

Netting self-harm and harm to Russia, mirror sanctions on these 20 sectors would result in a negative difference of \$334 million (column (10)), and a highly unfavorable EU cost share of 254%.

*Comment 7: Target sectors with zero or negligible harm to Russia*

As a special case of the previous comment, we find a considerable number of targeted product groups for which EU tariff sanctions of any kind would cause zero economic harm to Russia. Table 8 lists 24 large target sectors for which Russia experiences no welfare losses whatsoever following EU mirror sanctions (see column (8)). As the table shows, low

levels of harm to Russia are not a function of small pre-sanction trade values.<sup>22</sup> Rather, in the overwhelming majority of cases, the EU simply has no importer power vis-à-vis Russian exporters. Russian exporters can thus pass on 100% of EU tariff increases to EU consumers (see column (2)), which causes economic pain uniquely in the EU, but not in Russia.<sup>23</sup> As columns (6) and (7) of Table 8 indicate, EU welfare losses in individual sectors can easily exceed \$1 million and/or 15% of total pre-sanction import values.

## Concluding remarks

During the 2022 G7 Summit, the United States announced the imposition of significantly higher import tariffs on 570 product groups from Russia. Given the constant refrain of "alignment", "acting in unison at every stage", and "unprecedented coordination on sanctions" that pervaded the G7 Summit, it appears likely that other countries will follow the United States' lead and soon impose steep tariff increases on Russian import products. In this paper, we assume that the EU, as one of the United States' staunchest allies on Russia sanctions, fully aligns its actions with the United States and imposes "mirror" sanctions of identical scale and scope.

We estimate the overall effects of these EU mirror sanctions and find that they could reduce annual welfare in Russia by \$996 million per year, at the cost of \$150 million per year to the EU economy. Compared to the effects generated by (actual) US sanctions, (hypothetical) EU mirror sanctions would have considerably more "bite": Not only would welfare losses to Russia generated by EU sanctions be nearly four times those generated by US sanctions, but the United States also pays a significantly higher price, in relative terms, for its sanctions than the EU would pay.

Aggregate results are insufficiently detailed, however, to permit an assessment of the sector-specific economic effects that would result if the EU were to adopt, in full, the US sanctions package. Our sectoral analysis shows that copying the US sanctions would produce mixed economic results from the EU's perspective.

On the one hand, we identified features of an EU mirror sanctions package that are conducive to maximising harm on the Russian economy while at the same time minimising self-harm to the EU:

- EU mirror sanctions would cover dozens of product groups whose inclusion generates particularly large

20 As an example, take product group HS 870891 (Radiators and parts thereof, for tractors, motor vehicles), for which Russia's share in overall EU imports is nearly zero and the EU's share in Russian exports is around 2%. EU mirror tariffs would cause self-harm of \$68,000, while causing zero welfare losses to Russia.

21 To keep the number of rows in Table 7 manageable, we apply the threshold of \$1 million for column (10). Without such a threshold in place, the count of sectors with a negative balance for the EU would be 72, for total EU losses of \$568 million.

22 It would be trivial to highlight those product groups for which EU imports – and therefore potential Russian losses – are minuscule. This is why we selected import sectors in Table 8 for which affected trade exceeds the threshold of \$1 million (column (1)).

23 See Comment 4 for an explanation of economic mechanisms at work.

welfare losses for Russia. These target sectors together affect more than \$7.2 billion of EU pre-sanction imports and inflict economic harm upwards of \$760 million on the Russian economy. When appropriately weighted against self-harm to the EU economy, including a subset of these sectors would appear apt.

- EU mirror sanctions would include numerous sectors for which tariff increases generate particularly high welfare gains to the EU economy. We estimate that inclusion of the top-ten sectors alone would achieve EU welfare gains of more than \$360 million.
- For nearly 20 target sectors, EU mirror sanctions would result in complete disruption of import activity from Russia. This may bring with it certain policy advantages from the EU perspective, such as reduced dependency on Russian imports. However, blocked trade also entails significant economic costs, most notably welfare losses of nearly \$400 million to the EU economy. These losses are over 2.5 times the harm inflicted on Russia. Thus, tariff sanctions that result in blocked trade should be undertaken only after thorough analysis that carefully considers the benefits of decoupling against the substantial economic costs of doing so.

We have also identified features of an EU mirror sanctions package that raise questions about its effectiveness for certain sectors:

- Over 60 sectors targeted by EU mirror sanctions concern (i) imports from Russia that are insignificant to the EU economy and (ii) Russian exports to the EU that are insignificant for the Russian economy. EU tariff increases on these sectors inflict only minute economic damage on Russia and welfare gains to the EU that may not outweigh the administrative costs of implementing, administering and policing tariff increases on those sectors.
- For over 70 product groups, mirror sanctions result in EU welfare losses that exceed those suffered by Russia. Notable on this list are “semi-finished products of iron or non-alloy steel”, a sector for which the EU’s tariff increases would entail self-harm in excess of \$380 million – nearly 2.5 times the harm inflicted on Russia.
- For two dozen target sectors, EU tariffs would cause zero economic harm to Russia, because the EU lacks any market power vis-à-vis Russian exporters. Exporters from Russia are able to fully pass on higher tariff incidences to EU customers, many of whom can no longer afford Russian imports.

Ongoing coordination and alignment between sanctioning allies, as pledged by G7 leaders, are important actions to achieve continued economic pressure on Russia. Allies increase the effectiveness of their sanctions by synchronising the timing of sanctions and instruments chosen (import tariffs, in the case at hand). However, when it comes to the product level, adopting identical measures – selection of target products and tariff levels in this case – may prove to be economically suboptimal.

Considering the mixed results reported in this paper, the EU may wish to conduct its own thorough evaluation, rather than simply signing on to the tariff sanction package implemented by the United States in July of 2022. One option for the EU is to carefully select a subset of sectors from the US sanction package. Alternatively, the EU could design its own suite of tariff sanctions – a package that is fine-tuned to its economic relations with Russia. With the help of an evaluation tool similar to the one presented here, the EU (or any other sanctioning ally, for that matter) could avoid some of the weaknesses exposed above, and pinpoint those import sectors for which the trade-off between maximising harm to Russia and minimising self-harm is optimal. A sanctions package by the EU tailored to its economic relations with Russia may in fact be preferable also from the perspective of its allies, because the economic harm to Russia generated by such sanctions plus the current US tariff sanctions may easily surpass that of the combined effect achieved by US and EU mirror sanctions.

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