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Macroeconomic effects of US tariffs on steel and aluminium: who would pay the bill?

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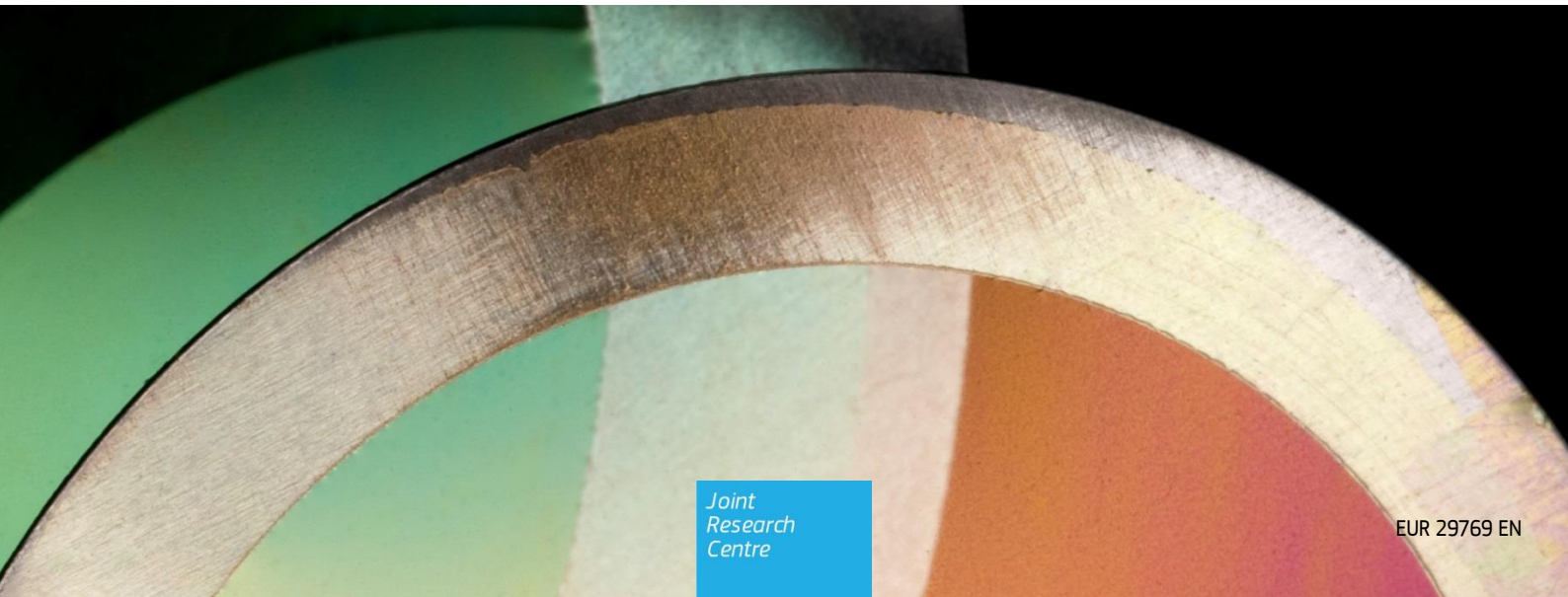

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Executive summary

Policy context

On 1 March 2018, the President of the United States (US) Donald Trump announced a 25 % tariff on steel and a 10 % tariff on aluminium imports. Later on, the US administration announced an exemption for the European Union (EU), Canada, Mexico, Australia, South Korea, Brazil and Argentina. On 31 May, the US announced that the tariffs will be imposed on the EU as from the 1 June 2018.

The declared aim of this trade policy is to strengthen the US metal industry by making domestic producers more competitive than producers abroad, save jobs, and protect national security. The US Commerce Department backed those arguments recommending protectionist measures for the steel and aluminium industry in two reports arguing, among other things, that such metals are needed for the construction of military jets and vehicles.

Key conclusions

The most significant economic effect of the US tariffs on steel and aluminium involves the trade of basic metals to the US, whose volume would decrease. If the EU was exempted, the most affected countries would have been India, Russia and Turkey, in terms of overall exports. However, the impact of the new tariffs on GDP and employment is negligible.

The US metal industry would increase its production, to the detriment of other sectors which would face higher input costs (such as manufacture of electrical equipment, machinery, or motor vehicles and other transport equipment).

As the EU joined the group of non-exempted countries, its basic metals exports would decrease by just over 1 %. Still, there would be countries hit more severely, like Russia and India. In all cases, though, the overall effects on total exports would be much smaller due to the relative importance of the metal sector in the economy.

Main findings

This analysis was carried out using the FIDELIO model and a multiregional input-output model. We have compared a baseline scenario without any tariff with two alternative scenarios. In the first one, the tariff was applied to US imports from China, India, Japan, Russia and Turkey. In the second scenario, we took into account that the EU joined the group of non-exempted countries. The analysis does not consider retaliation measures that other countries might implement in reaction and that would alter our results.

Under the first scenario, exports of metal products of the countries targeted by the US tariffs may decrease by up to 4.7 % (which is the case of India). As expected, when the EU is exempted from the new tariffs there are no negative effects on its exports.

A similar picture emerges for the effects on value added (the effects on employment are similar) which would decrease in all countries affected by the new US tariffs. The decrease would be driven by the negative impact on the sector producing basic metals, with some additional induced negative effects in sectors such as mining and manufacture of fabricated metal products (India), manufacture of coke and refined petroleum products (Russia) and water transport (Turkey). While there would be significant sectoral effects, their value added and employment would decrease by small amounts at the country level.

Analysing the alternative scenario where the EU exemption is cancelled we find that the EU basic metals sector is negatively affected by the new tariffs - its basic metals exports would decrease by just over 1 % - but the economy-wide impact is small. The United Kingdom, Sweden and the Netherlands would be the most affected EU countries.

1 Introduction

In March 2018, the United States (US) President Donald Trump announced the imposition of a tariff on US imports of steel and aluminium products. This Science for Policy report sheds light on the possible macroeconomic impacts of this policy, focusing in particular on exports, value added (VA), output and employment.

The modelling analysis considers two possible scenarios to be compared with a baseline in which no tariffs are imposed by the US government. In the first scenario, we assume that the European Union (EU) is exempted from the new tariffs. In the second scenario, we instead assume that the EU is not exempted, as it has been announced on 31 May 2018.

The remainder of the report is organised as follows. The next section provides a brief overview of the policy proposal, the relative importance of different trading partners for steel and aluminium trade with the US, and to what extent different EU countries might be exposed. Section 3 highlights the main characteristics of the model used. Section 4 describes the main results of the analysis and Section 5 concludes.

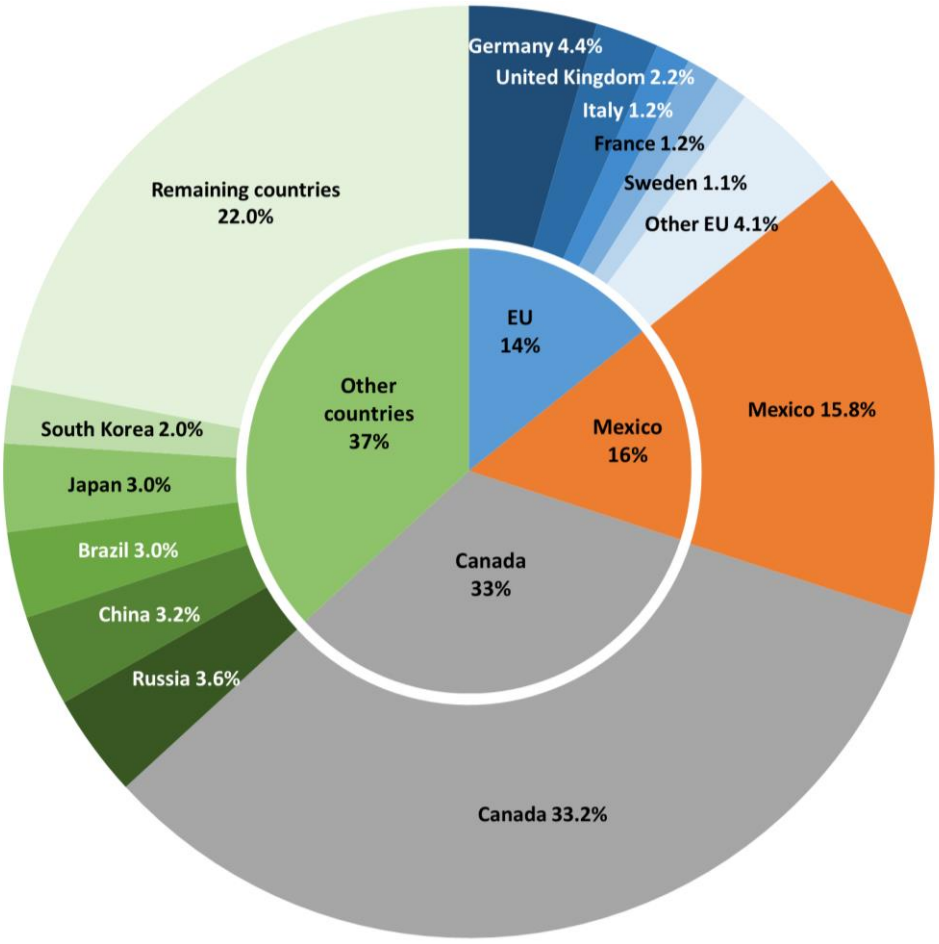
2 Current status

At the beginning of March 2018, the US administration announced a 25 % tariff on imports of steel products and a 10 % tariff on imports of aluminium products. Soon afterwards, it declared temporary exemptions from the tariff for the following trading partners: the EU, Canada, Mexico, Australia, South Korea, Brazil and Argentina. At the beginning of May, the US administration announced that an agreement for permanent exemption had been reached for Argentina, Australia, Brazil and South Korea. On 31 May the US decided to impose the tariff also to the EU as from 1 June 2018 ([1]).

2.1 Main US trading partners for basic metal products

Figure 1 shows the geographical distribution of US imports of basic metals ([2]) (where steel and aluminium products are included) by trading partner. Table A1 in the Appendix shows the import shares of the different trading partners with more detail. These data come from the World Input-Output Database ([3]) (WIOD), which will also be used in the analysis reported in Sections 3 and 4.

Figure 1. Geographical distribution by trading partner of US imports of basic metals (2010)



Source: Own elaboration based on WIOD data.

Most of the US imports of basic metals (about 50 % of the total) are from Canada and Mexico. As for the EU countries, the most exposed Member States would be Germany and the United Kingdom. Other countries that seem most likely to be affected by the tariffs would be Russia, China, Japan, India and Turkey.

([1]) In a statement, the US administration said that the deals with Brazil, Argentina and Australia would be finalised shortly without disclosing more detailed terms. See Reuters news available at https://www.reuters.com/article/us-usa-trade-metals/trump-keeps-u-s-allies-metals-producers-guessing-on-tariff-exemptions-idUSKBN1I1164. From the 1 June 2018 the Trump administration put the tariffs on the EU, Canada and Mexico (see https://www.cnbc.com/2018/05/31/trump-administration-will-put-steel-and-aluminum-tariffs-on-canada-mexico-and-the-eu.html).

([2]) Classification of Product Activities (CPA) version 2008: C24 "Basic iron and steel and ferro-alloys".

([3]) www.wiod.org (release 2016)

2.2 Potential impact for the EU countries: multiplier analysis

In order to provide more evidence on the possible repercussions of the US trade policy in the EU, we identify the EU countries which would be potentially most affected in terms of employment and income effects through a multiregional input-output (IO) model ([4]).

2.2.1 Employment

According to the multiregional IO analysis based on WIOD data, over 100 000 jobs are linked to the EU exports of basic metals to the US, of which 30 % is associated to employment in different EU countries to those actually exporting these products (i.e. spillover effects).

Almost 24 000 jobs in Germany are linked to the EU exports of basic metals to the US, followed by Italy with 15,500 jobs, the United Kingdom with 11 600 jobs and France, the Czech Republic and the Netherlands with 8 300, 5 200 and 4 900 jobs, respectively. All of them amount to more than two thirds of all jobs directly and indirectly associated with the EU exports of basic metals to the US.

At the sectoral level, the basic metals manufacturing industry is the one with the highest number of jobs linked to the EU exports of basic metals to the US. Around 34 % of all jobs linked to those exports are concentrated in this industry. Nevertheless, there are other EU industries that may suffer the effects of the new US trade policy measure. Administrative and support service activities account for 7 700 jobs associated with EU exports of basic metals to the US followed by wholesale activities (7 200 jobs), sewerage, waste collection, materials recovery, etc. (5 000 jobs) and land transport (4 400 jobs). These five industries accumulate nearly 60 % of all the jobs associated with such exports.

In a little more detail, the sectors most likely to be affected are:

1. Basic metals (C24) in Germany, Italy, the United Kingdom, France, the Czech Republic, Sweden, Austria and Romania;
2. Wholesale trade activities (G45-47) in Italy, Germany and the United Kingdom;
3. Administrative and support services (N77) in Germany and Italy;
4. Land transport (H49) in Germany;
5. Sewerage, waste collection, materials recovery, etc. (E36-39) in Italy.

In sum, the employment linked to the EU exports of basic metals to the US amounts to 100 000 jobs and represents 0.05 % of the total employment in the EU. The effects may be suffered most in terms of employment by Germany, Italy and the United Kingdom, mostly as direct exporters of basic metals to the US.

2.2.2 Income effect

Around EUR 9.5 billion of VA is linked to the EU exports of basic metals to the US, of which 28 % is associated with VA generated in EU different countries to those exporting such products.

Germany is the EU country that contributes most to the VA generated by EU exports of basic metals to the US (EUR 2.5 billion), followed by Italy (EUR 1.4 billion), the United Kingdom (EUR 1.3 billion), France (EUR 852 million), the Netherlands (EUR 657 million) and Sweden (EUR 491 million). These six countries alone account for slightly more than three quarters of the VA associated to such exports.

At the sectoral level, the basic metals industry is the one with the greatest VA generated through the EU exports of basic metals to the US. Around 37 % of all the VA (EUR 3.5 billion) is generated in this industry. Similar to employment, there are other EU industries that may suffer the effects of the new tariffs imposed by the US. Wholesale trade activities generated VA of EUR 615 million in the EU associated with EU exports of basic metals to the US followed by sewerage, waste collection, materials recovery, etc. (EUR 508 million), electricity (EUR 439 million) and administrative and support services (EUR 405 million). These five sectors represent 58 % of all the VA generated in the production of such exports.

In more detail, the sectors most likely to be affected in VA terms are:

1. Basic metals in Germany, Italy, the United Kingdom, France, the Czech Republic, Sweden, Austria, the Netherlands, Spain and Belgium;
2. Wholesale trade activities in Germany and Italy;

([4]) See Arto et al. (2015) for technical details. Numbers refer to 2014 data.

3. Administrative and support services in Germany;
4. Electricity in Germany;
5. Sewerage, waste collection, materials recovery, etc. in Italy.

In short, the VA associated with the EU exports of basic metals to the US amount to EUR 9.5 billion and represents 0.07 % of the total GDP in the EU. Analogously to employment, the most likely affected countries in terms of GDP are Germany, Italy and the United Kingdom, principally as direct exporters of basic metals to the US Tables A3 and A4 in the Appendix contain the detailed results summarised above by country and by sector, respectively.

3 Methodology

In order to estimate the macroeconomic impact of the US trade tariffs on steel and aluminium, we use the model FIDELIO. FIDELIO is a macroeconomic multi-sectoral dynamic econometric input-output (IO) model with frictions (new-Keynesian assumptions) such as wages not clearing the labour market or consumption adjusting slowly to its optimum level according to error correction specifications. There are no rigidities on the supply side, with price and production factors adjusting to what is demanded in the market. Looking in particular at the trade block, demand for imports is modelled as a two-steps procedure. First, the share of imports in total demand for each commodity is determined. Then, in a second nest of the demand for imports, a trade matrix is used to distribute imports to the country of origin, distributing the demand for imports to the various trading partners. For both the first and second nest, the model uses Armington elasticities, from GTAP database ([5]).

There are two important caveats to bear in mind when reading the results of this analysis and they refer to the sectoral classification and the countries included in the model.

Regarding the sectoral classification, we used WIOD data, which classifies industries and products in 56 groups. As stated above, steel and aluminium products are grouped under the category of "basic iron and steel and ferro-alloys" (CPA_C24). However, this category includes manufactures made with other metals such as basic precious and other non-ferrous metals and casting of services of metals. In order to refine our analysis, we used the Organization for Economic Co-operation and Development (OECD) balanced merchandise trade data ([6]) to gauge the importance of steel and aluminium products over the whole CPA_C24 goods imported by the US from each trading partner. These data allow us to compute country-specific tariffs with the shares of steel and aluminium products exported by all trading partners to the US over the broader category of basic metals. For instance, a 40 % share of steel products and a 10 % share of aluminium products would result in an 11 % tariff for the CPA_C24 products in FIDELIO according to the following calculation: 25 %x0.40 + 10 %x0.10 ([7]).

The second consideration is related to the countries included in the FIDELIO model. FIDELIO models the 28 Member States of the EU and 7 non-EU countries (Brazil, China, India, Japan, Russia, Turkey and the US) while all other countries are aggregated into one single region (Rest of the World) and are essentially not modelled. Thus, it is impossible to analyse all the effects of the US tariffs for some of the countries involved like, for example, Canada, Mexico and South Korea.

In a first scenario, we assume that country-specific average tariffs are imposed on US imports of basic metals from the non-exempted countries in FIDELIO (China, India, Japan, Russia and Turkey). In a second scenario, we assume that there is no exemption for the EU. In both cases, we assumed that there are no tariffs applicable to the region "Rest of the World"([8]). None of the two scenarios analyses measures that other countries might take in reaction. These measures would imply different results.

([5]) See Kratena et al. (2013, 2017) for technical details.

([6]) https://stats.oecd.org/Index.aspx?DataSetCode=BIMTS_CPA. However, the OECD trade data used was not publicly available (HS 6-digit classification) but provided directly by the OECD.

([7]) Table A1 in the Appendix shows all the country-specific tariffs used in the analysis.

([8]) This analysis was carried out in April/May, when no tariff was imposed on Canada and Mexico, so the "Rest of the World region" was mostly exempted.

4 Results

The following section describes the main results of the analysis. Section 4.1 reports the results for the first scenario in which the EU is exempted from the tariffs. Then, we look at a second scenario in which the US government removes the exemption for the EU (Section 4.2).

4.1 First scenario: modelling results with EU exempted

The modelling results have to be interpreted as differences with respect to the baseline scenario, in which no tariff is applied. For example, -0.1 % in employment means that the employment level (with tariff) would be lower by 0.1 % with respect to the case where no tariff is applied.

The most significant economic effect of the US tariffs would obviously concern the trade of basic metals. Table 1 shows the change in the value of the exports of basic metals one year after the introduction of the new tariffs. The most affected country would be India, with a 4.69 % decrease in exports, equal to EUR 752 million, followed by Russia (4.01 %, or EUR 1.2 billion), China (2.02 %, EUR 1.3 billion), Turkey (1.9 %, EUR 354 million) and Japan (1.58 %, EUR 779 million). US exports decrease by about 0.5 %, or EUR 117 million. In the EU and Brazil there would be a positive but very small increase in exports.

Table 1. Difference in exports of basic metals

Country	Exports
EU	0.08 %
Brazil	0.31 %
China	-2.02 %
India	-4.69 %
Japan	-1.58 %
Russia	-4.01 %
Turkey	-1.90 %
US	-0.50 %

Source: Own elaboration.

In terms of sectors, the sector most affected by the US trade policy would be the "manufacture of basic metals" (C24) ([9]). Table 2 shows the impacts on VA, employment and output in this sector for the various countries analysed.

Table 2. Difference in VA, employment and output for basic metals sector

Country	VA	Employment	Output
EU	0.05 %	0.06 %	0.06 %
Brazil	0.08 %	0.08 %	0.08 %
China	-0.10 %	-0.10 %	-0.10 %
India	-0.51 %	-0.51 %	-0.51 %
Japan	-0.44 %	-0.44 %	-0.44 %
Russia	-1.42 %	-1.42 %	-1.42 %
Turkey	-1.31 %	-1.31 %	-1.31 %
US	1.45 %	1.61 %	1.52 %

Source: Own elaboration.

Russia is the country with the biggest negative effect in the basic metals manufacturing sector with a difference of roughly -1.4 % in all variables. Turkey's negative variation would be slightly lower at -1.3 %, while for the other countries there would be smaller negative impacts. The US sector producing steel and aluminium is positively affected by the tariff as its output would increase by about 1.5 %. Brazil and the EU also show a positive increase in the variables analysed, but the variations are negligible.

The basic metals manufacturing sector would certainly be the most affected by the US trade policy on steel and aluminium but not the only one. Due to its links with the other productive sectors of the economy, there would be ripple effects in other sectors. In particular, we observe significant impacts on mining and the manufacture of fabricated metal in India, on the manufacture of coke and refined petroleum products in Russia and on the water transport sector in Turkey (detailed results are not reported for the sake of brevity but are available upon request).

([9]) Sectors can produce more than one product. In this case, the vast majority of the goods produced by the manufacturing sector of basic metals were basic metal products.

Finally, Table 3 shows the impact of the US trade policy at the country level for VA, employment and total exports of countries.

Table 3. Difference in VA, employment and exports by country

Country	VA	Employment	Exports
EU	0.004 %	0.004 %	0.010 %
Brazil	0.001 %	0.002 %	0.022 %
China	-0.007 %	-0.001 %	-0.037 %
India	-0.024 %	-0.011 %	-0.219 %
Japan	-0.009 %	-0.007 %	-0.091 %
Russia	-0.087 %	-0.054 %	-0.359 %
Turkey	-0.030 %	-0.027 %	-0.206 %
US	-0.010 %	0.003 %	-0.072 %

Source: Own elaboration.

As expected, given the relatively small policy measure analysed, there are no economically significant impacts on the VA, employment and total exports. The biggest impact would be the decrease in Russia's total exports which is equal to -0.4 % (EUR 1.3 billion). Although negligible, the impact for the US is also negative. In fact, the increase in the output of the US' basic metals manufacturing sector mentioned above would be detrimental to other sectors' output, such as the manufacture of electrical equipment, machinery or motor vehicles and other transport equipment. One additional finding (also not reported for the sake of brevity) is that the impacts remain unchanged over time assuming that the new tariffs remain in place for five years. In the fifth year, the differences to the baseline values would be similar to those reported in the tables above.

Finally, these results refer to the case in which the tariff revenues would have been used by the US government to reduce its federal deficit. The negative effects on the US economy are slightly smaller assuming that the tariff revenues would have been instead fully transferred to US households for consumption. These results do not make much difference due to the small amount of revenues raised thanks to the new tariffs.

4.2 Second scenario: EU not exempted

An alternative scenario is the one in which the US decides to remove the tariff exemption for the EU countries.

The FIDELIO results of the second scenario are reported in Tables 4, 5 and 6 below, constructed with the same logic as Tables 1, 2 and 3 respectively. Only the EU Member States for which the US import quota is equal to or greater than 1 % are reported for the sake of clarity (the full results for all the EU countries can be found in Tables A5, A6 and A7 in the Appendix) ([10]).

Table 4. Difference in exports of basic metals: no EU exemption

Country	Exports
EU	-1.20 %
Austria	-1.31 %
Belgium	-1.02 %
France	-1.51 %
Germany	-2.33 %
Italy	-1.75 %
Netherlands	-1.78 %
Spain	-1.48 %
Sweden	-2.75 %
United Kingdom	-3.74 %
Brazil	0.69 %
China	-1.95 %
India	-4.63 %
Japan	-1.52 %
Russia	-4.04 %
Turkey	-1.94 %
US	-1.00 %

Source: Own elaboration.

([10]) Also, it is important to bear in mind that with small absolute numbers even relatively high percentage changes with respect to the baseline scenario are of little economic relevance.

Table 4 shows that the new US trade policy would negatively affect the exports of steel and aluminium products for all the EU countries with significant trade links with the US, in particular the United Kingdom (-3.7 %, EUR 851 million) and Sweden (-2.7 %, EUR 239 million). For these two countries, compared to most EU countries, the importance of the US as an importer of basic metals is higher. Nonetheless, there are economically significant impacts on other countries such as Germany (-2.3 %), Italy (-1.7 %) and the Netherlands (-1.8 %). For the non-EU countries the impact is similar to that estimated with the previous scenario, except for the US, where its export levels would decrease even more, down to -1.0 %, equal to EUR 234 million.

A similar picture arises from the results depicted in Table 5, concerning the impact on the basic metals manufacturing sector.

Table 5. Difference in VA, employment and output for basic metals sector: no EU exemption

Country	VA	Employment ([1])	Output
EU	-0.76 %	-1.02 %	-0.76 %
Austria	-0.92 %	-0.92 %	-0.92 %
Belgium	-0.87 %	-0.87 %	-0.87 %
France	-0.90 %	-0.90 %	-0.90 %
Germany	-1.30 %	-1.30 %	-1.30 %
Italy	-0.77 %	-0.77 %	-0.77 %
Netherlands	-1.50 %	-1.50 %	-1.50 %
Spain	-0.52 %	-0.52 %	-0.52 %
Sweden	-1.86 %	-1.86 %	-1.86 %
United Kingdom	-2.23 %	-2.22 %	-2.23 %
Brazil	0.18 %	0.18 %	0.18 %
China	-0.08 %	-0.08 %	-0.08 %
India	-0.50 %	-0.50 %	-0.50 %
Japan	-0.40 %	-0.40 %	-0.40 %
Russia	-1.44 %	-1.43 %	-1.44 %
Turkey	-1.34 %	-1.34 %	-1.34 %
US	2.83 %	3.17 %	2.99 %

([1]) The employment effects have to be taken with caution since they might be overestimated due to the current specification of the model (around 11,000 jobs in the whole EU).

Source: Own elaboration.

Consistent with the effects on exports shown in Table 4, the EU countries where this sector would suffer most in terms of VA, employment and output would be the United Kingdom, Sweden, the Netherlands and Germany. Other sectors indirectly affected by the new US tariffs would be the "manufacture of fabricated metal products, except machinery and equipment" and "wholesale trade, except of motor vehicles and motorcycles" in the United Kingdom, "sewerage, treatment and disposal activities, materials recovery" and "manufacture of coke and refined petroleum products" in Sweden and the Netherlands, and "mining and quarrying" and "electricity, gas, steam and air conditioning supply" in Germany. It is interesting to note that in all these countries the negative effects of the tariffs would be higher than in Russia, the worst-off among the non-EU economies. A possible explanation might lie in the importance of foreign demand relative to domestic demand in the production of basic metals.

Table 6 shows the country-level impact of the US trade policy. Once again, it turns out that the economy-wide effects are small, with negative but negligible changes in VA, employment and total exports. Also under this scenario the impact for the US remains negative. Looking at what the economic theory suggests, this result seems to show that the efficiency losses in terms of consumers and producers surplus more than compensate the terms of trade gains that the tariff is expected to induce. Sweden appears to be the EU Member State that would suffer most in terms of VA, which is lower by 0.05 % (EUR 192 million). In this case, though, possibly due to the overall importance of the steel and aluminium sector in the economy, the country suffering the most from the US trade policy is Russia, where the VA is 0.1 % (EUR 1.2 billion) lower than otherwise and exports would be lower by almost four times this figure.

Table 6. Difference in VA, employment and exports by country: no EU exemption

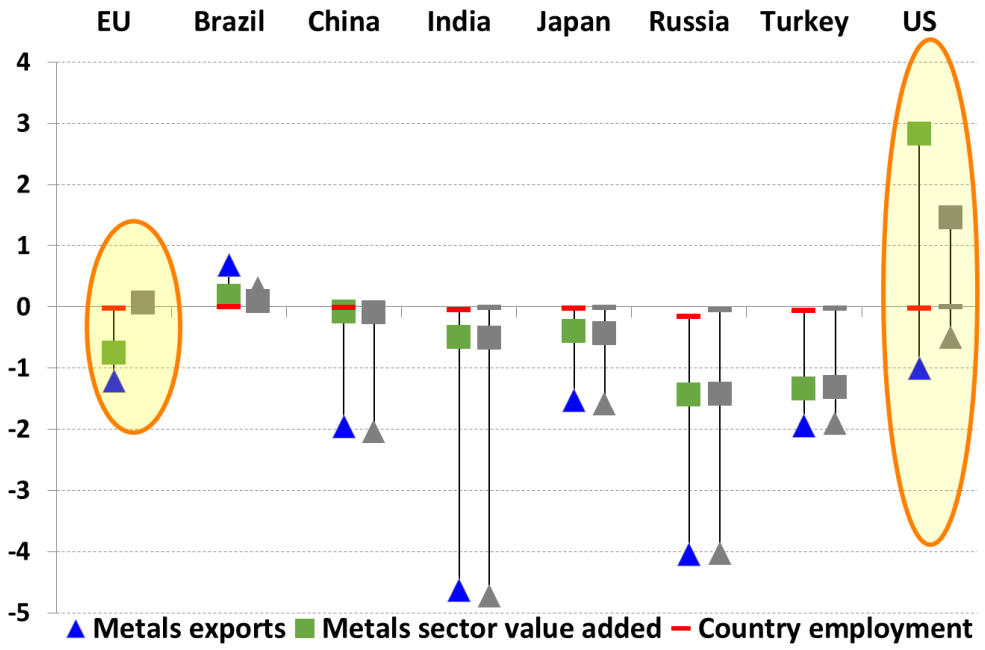
Country	VA	Employment ([1])	Exports
EU	-0.018 %	-0.019 %	-0.039 %
Austria	-0.033 %	-0.026 %	-0.092 %
Belgium	-0.025 %	-0.022 %	-0.081 %
France	-0.011 %	-0.010 %	-0.053 %
Germany	-0.027 %	-0.023 %	-0.090 %
Italy	-0.019 %	-0.017 %	-0.088 %
Netherlands	-0.023 %	-0.015 %	-0.055 %
Spain	-0.014 %	-0.012 %	-0.071 %
Sweden	-0.050 %	-0.043 %	-0.160 %
United Kingdom	-0.022 %	-0.020 %	-0.097 %
Brazil	0.004 %	0.004 %	0.048 %
China	-0.001 %	0.003 %	-0.021 %
India	-0.024 %	-0.012 %	-0.215 %
Japan	-0.004 %	-0.001 %	-0.069 %
Russia	-0.100 %	-0.061 %	-0.401 %
Turkey	-0.034 %	-0.030 %	-0.219 %
US	-0.024 %	-0.001 %	-0.153 %

([1]) The employment effects have to be taken with caution since they might be overestimated due to the current specification of the model (around 43,000 jobs in the whole EU).

Source: Own elaboration.

Finally, Figure 2 shows a comparison between the two scenarios. The figure describes the percentage variation of three main macroeconomic variables for the EU and the seven non-EU regions, including the US. The three variables are the exports of basic metal products (corresponding to the triangles), the VA of the metals sector (the squared series), and the employment at the country level. The coloured series represent the impacts under the second scenario, while the grey ones are the results under the first scenario. The main outcome that the figure highlights is that the impact under the two scenarios would be similar for most countries, except for the EU and the US. For the EU all three variables would worsen under the second scenario. For the US, although the VA of the metals sector would increase more under the second scenario, the negative impact for the basic metals export would increase too, with no improvement for the economy as a whole.

Figure 2. Comparison between the two scenarios: main variables variation (Unit: percentage)



Source: Own elaboration.

5 Conclusions

The most significant economic effect of the new US tariffs relates to the international trade of basic metals, which would decrease due to this protectionist measure. As the economic theory suggests there would be a negative impact for the trading partners affected, in particular for India, Russia and Turkey that would see a decrease in their total export equal to 0.219 %, 0.359 %, and 0.206 %, respectively.

The EU would be negatively affected by the US tariffs on steel and aluminium. This negative impact would be more relevant for the basic metals manufacturing sector, which would show a decrease in its VA equal to -0.76 %, than for the economy as a whole: for the total EU, the decrease in VA is expected to be -0.018 %.

The US metal industry would increase its production, to the detriment of other sectors which would face higher input costs (such as the manufacture of electrical equipment, machinery, or motor vehicles and other transport equipment). Although negligible, the impact for the US in terms of VA, employment, and total export is negative under both analysed scenarios.

It is also important to highlight that we have assumed that no country would react to the new US trade policy with other protectionist measures such as additional tariffs or quotas. A further development of the analysis might consider this as an alternative scenario, in the event that these types of measures have been considered by some countries such as China or the EU.

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List of abbreviations and definitions

CPA	Classification of Product Activities
EU	European Union
IO	Input-Output
OECD	Organization for Economic Co-operation and Development
VA	Value Added
US	United States
WIOD	World Input-Output Database

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Annex 1. Additional results

Table A1. Geographical distribution by trading partner of US imports of basic metals (2010)

Trading partner	Import share	Trading partner	Import share
EU	14.2 %	Brazil	3.0 %
Austria	0.7 %	China	3.2 %
Belgium	0.6 %	India	1.7 %
France	1.2 %	Japan	3.0 %
Germany	4.4 %	Russia	3.6 %
Italy	1.2 %	Turkey	0.8 %
Netherlands	0.6 %	RoW	70.1 %
Spain	0.6 %	Canada	33.2 %
Sweden	1.1 %	Mexico	15.8 %
United Kingdom	2.2 %	South Korea	2.0 %
Other EU	1.7 %	Australia	1.5 %

Source: Own elaboration based on WIOD data.

Table A2. Calculations of the country-specific tariffs based on OECD data

Trading partner	Steel share in basic metal	Aluminium share in basic metal	Country specific tariff ([1])	Trading partner	Steel share in basic metal	Aluminium share in basic metal	Country specific tariff
Austria	24 %	3 %	6 %	Luxembourg	9 %	3 %	3 %
Belgium	38 %	5 %	10 %	Latvia	42 %	17 %	12 %
Bulgaria	55 %	3 %	14 %	Malta	76 %	2 %	19 %
Cyprus	83 %	3 %	21 %	Netherlands	38 %	8 %	10 %
Czech Republic	31 %	8 %	9 %	Poland	39 %	12 %	11 %
Denmark	36 %	11 %	10 %	Portugal	36 %	28 %	12 %
Germany	71 %	3 %	18 %	Romania	57 %	9 %	15 %
Spain	51 %	9 %	14 %	Slovakia	39 %	3 %	10 %
Estonia	28 %	7 %	8 %	Slovenia	30 %	3 %	8 %
Finland	58 %	6 %	15 %	Sweden	37 %	2 %	10 %
France	30 %	17 %	9 %	Brazil	62 %	12 %	17 %
United Kingdom	36 %	14 %	10 %	China	24 %	28 %	9 %
Greece	8 %	2 %	2 %	India	54 %	15 %	15 %
Croatia	52 %	14 %	14 %	Japan	32 %	19 %	10 %
Hungary	53 %	10 %	14 %	Russia	51 %	3 %	13 %
Ireland	39 %	14 %	11 %	Turkey	89 %	2 %	22 %
Italy	54 %	10 %	15 %	RoW	58 %	16 %	16 %
Lithuania	56 %	6 %	14 %				

([1]) Tariffs computed weighting the 25 % steel tariff and the 10 % aluminium tariff with the shares of steel and aluminium products exported by all trading partners to the US over the broader category of basic metals.

Source: OECD, balanced merchandise trade data (2018) and own elaboration (note that the data used were classified in HS 6-digit level while the published data are classified in CPA).

Table A3. Employment and VA associated with EU exports of basic metals to the US, by EU country

	Employment		VA	
	Total (thousand jobs)	**Spillover share**	**Total (million EUR)**	**Spillover share**
Austria	3.2	27.7 %	424.8	25.5 %
Belgium	2.3	46.0 %	291.7	45.3 %
Bulgaria	1.2	64.0 %	25.9	59.7 %
Croatia	0.4	59.8 %	14.8	62.6 %
Cyprus	0.0	99.9 %	1.8	99.8 %
Czech Republic	5.2	28.3 %	221.6	27.6 %
Denmark	0.4	73.3 %	58.6	80.0 %
Estonia	0.1	86.4 %	6.2	83.6 %
Finland	1.8	20.4 %	230.9	20.1 %
France	8.3	31.7 %	851.6	32.2 %
Germany	23.8	21.4 %	2 524.4	21.0 %
Greece	1.2	21.4 %	102.3	20.5 %
Hungary	1.2	67.3 %	44.8	64.4 %
Ireland	0.2	73.5 %	27.6	78.8 %
Italy	15.5	15.4 %	1 362.6	15.2 %
Latvia	0.2	85.0 %	5.1	87.8 %
Lithuania	0.1	95.8 %	6.5	95.5 %
Luxembourg	0.3	39.5 %	32.0	44.5 %
Malta	0.0	99.9 %	1.2	99.9 %
Netherlands	4.9	68.3 %	656.5	68.2 %
Poland	4.7	76.0 %	178.9	77.3 %
Portugal	0.6	58.6 %	31.7	55.9 %
Romania	3.9	30.7 %	108.5	30.6 %
Slovakia	1.0	69.8 %	51.4	67.9 %
Slovenia	0.7	49.8 %	38.9	47.3 %
Spain	4.3	31.4 %	398.1	29.6 %
Sweden	3.8	17.7 %	491.1	17.8 %
United Kingdom	11.6	17.0 %	1 267.1	16.6 %
Total	**100.8**	**30.1 %**	**9,456.6**	**27.9 %**

Source: Own elaboration.

Table A4. Employment and VA associated with EU exports of basic metals to the US, by EU sector

NACE code	Sector	Employment (thousand jobs)	VA (million EUR)
A01	Crop and animal production, hunting and related services	0.9	27.3
A02	Forestry and logging	0.1	53.7
A03	Fishing and aquaculture	0.8	150.6
B	Mining and quarrying	0.1	13.2
C10T12	Manufacture of food, beverages and tobacco products	0.7	59.8
C13T15	Manufacture of textiles, wearing apparel and leather products	0.9	69.0
C16	Manufacture of wood and of products of wood and cork	34.2	3 471.0
C17	Manufacture of paper and paper products	4.1	271.4
C18	Printing and reproduction of recorded media	0.3	32.9
C19	Manufacture of coke and refined petroleum products	0.6	54.3
C20	Manufacture of chemicals and chemical products	1.2	124.2
C21	Manufacture of basic pharmaceutical product	0.2	10.1
C22	Manufacture of rubber and plastic products	0.3	35.8
C23	Manufacture of other non-metallic mineral products	0.1	15.0
C24	Manufacture of basic metals	0.4	25.1
C25	Manufacture of fabricated metal products	1.3	106.5
C26	Manufacture of computer, electronic and optical products	1.5	439.0
C27	Manufacture of electrical equipment	0.4	50.0
C28	Manufacture of machinery and equipment n.e.c.	5.0	508.5
C29	Manufacture of motor vehicles, trailers and semi-trailers	2.4	158.3
C30	Manufacture of other transport equipment	1.2	73.3
C31_32	Manufacture of furniture; other manufacturing	7.2	615.5
C33	Repair and installation of machinery and equipment	0.0	0.7
D35	Electricity, gas, steam and air conditioning supply	3.4	105.9
E36	Water collection, treatment and supply	4.4	323.2
E37T39	Sewerage; waste collection, treatment and disposal activities	0.1	13.7
F	Construction	0.1	13.3
G45	Wholesale and retail trade and repair of motor vehicles	1.8	200.0
G46	Wholesale trade, except of motor vehicles and motorcycles	0.7	33.3
G47	Retail trade, except of motor vehicles and motorcycles	1.0	46.8
H49	Land transport and transport via pipelines	0.2	22.7
H50	Water transport	0.1	15.4
H51	Air transport	0.3	59.5
H52	Warehousing and support activities for transportation	1.4	259.8
H53	Postal and courier activities	1.1	121.5
I	Accommodation and food service activities	1.3	237.6
J58	Publishing activities	0.2	34.8
J59_60	Motion picture, video and television programme production	0.5	46.7
J61	Telecommunications	0.3	224.5
J62_63	Computer programming, consultancy and related activities	4.0	352.5
K64	Financial service activities (no insurance and pension funding)	1.4	109.8
K65	Insurance, reinsurance and pension funding	0.1	9.3
K66	Activities auxiliary to financial services and insurance activities	0.6	35.9
L68	Real estate activities	0.7	37.6
M69_70	Legal and accounting activities; activities of head offices	0.5	41.8
M71	Architectural and engineering activities; technical testing	7.7	404.8
M72	Scientific research and development	1.6	146.7
M73	Advertising and market research	0.6	35.5
M74_75	Other professional, scientific and technical activities	0.2	11.6
N	Administrative and support service activities	1.1	62.4
O84	Public administration and defence; compulsory social security	0.0	0.0
P85	Education	0.3	14.6
Q	Human health and social work activities	0.5	22.9
R-S	Other service activities	0.3	27.8
T	Activities of households as employers	0.3	19.7
	Total	100.8	9,456.6

Source: Own elaboration.

Table A5. Change in exports of basic metals: no EU exemption

Country	Difference
EU	-1.201 %
Austria	-1.306 %
Belgium	-1.019 %
Bulgaria	-0.299 %
Cyprus	-0.281 %
Czech Republic	-1.779 %
Denmark	-1.267 %
Germany	-2.334 %
Spain	-1.478 %
Estonia	-0.704 %
Finland	-2.227 %
France	-1.507 %
United Kingdom	-3.740 %
Greece	-0.364 %
Croatia	-3.525 %
Hungary	-0.448 %
Ireland	-0.650 %
Italy	-1.750 %
Lithuania	-0.306 %
Luxembourg	-0.628 %
Latvia	-0.401 %
Malta	-0.243 %
Netherlands	-1.784 %
Poland	-1.181 %
Portugal	-0.360 %
Romania	-2.332 %
Slovakia	-0.389 %
Slovenia	-1.198 %
Sweden	-2.747 %
Brazil	0.693 %
China	-1.953 %
India	-4.630 %
Japan	-1.521 %
Russia	-4.041 %
Turkey	-1.945 %
US	-1.002 %

Source: Own elaboration.

Table A6. Variation in VA, employment and output of basic metals sector: no EU exemption

Variable	**VA**	**Employment**	**Output**
Country	**Difference**	**Difference**	**Difference**
EU	-0.757 %	-1.017 %	-0.763 %
Austria	-0.921 %	-0.919 %	-0.920 %
Belgium	-0.874 %	-0.870 %	-0.872 %
Bulgaria	-0.213 %	-0.213 %	-0.213 %
Cyprus	-0.116 %	-0.114 %	-0.115 %
Czech Republic	-1.075 %	-1.074 %	-1.075 %
Denmark	-0.962 %	-0.959 %	-0.961 %
Germany	-1.298 %	-1.295 %	-1.297 %
Spain	-0.521 %	-0.519 %	-0.520 %
Estonia	-0.768 %	-0.766 %	-0.767 %
Finland	-1.644 %	-1.642 %	-1.643 %
France	-0.902 %	-0.899 %	-0.901 %
United Kingdom	-2.234 %	-2.223 %	-2.229 %
Greece	-0.182 %	-0.181 %	-0.182 %
Croatia	-1.105 %	-1.104 %	-1.105 %
Hungary	-0.272 %	-0.271 %	-0.272 %
Ireland	-0.541 %	-0.540 %	-0.541 %
Italy	-0.769 %	-0.766 %	-0.768 %
Lithuania	-0.140 %	-0.139 %	-0.140 %
Luxembourg	-0.489 %	-0.484 %	-0.486 %
Latvia	-0.350 %	-0.348 %	-0.350 %
Malta	-0.002 %	-0.003 %	-0.002 %
Netherlands	-1.497 %	-1.495 %	-1.496 %
Poland	-0.578 %	-0.577 %	-0.578 %
Portugal	-0.214 %	-0.212 %	-0.214 %
Romania	-1.166 %	-1.166 %	-1.166 %
Slovakia	-0.313 %	-0.313 %	-0.313 %
Slovenia	-0.753 %	-0.751 %	-0.752 %
Sweden	-1.861 %	-1.859 %	-1.860 %
Brazil	0.177 %	0.178 %	0.177 %
China	-0.083 %	-0.083 %	-0.084 %
India	-0.498 %	-0.496 %	-0.498 %
Japan	-0.403 %	-0.402 %	-0.403 %
Russia	-1.436 %	-1.435 %	-1.436 %
Turkey	-1.338 %	-1.337 %	-1.338 %
US	2.829 %	3.168 %	2.986 %

Source: Own elaboration.

Table A7. Variation in VA, employment and output by country: no EU exemption

Variable	**VA**	**Employment**	**Export**
Country	**Difference**	**Difference**	**Difference**
EU	-0.018 %	-0.019 %	-0.039 %
Austria	-0.033 %	-0.026 %	-0.092 %
Belgium	-0.025 %	-0.022 %	-0.081 %
Bulgaria	-0.014 %	-0.011 %	-0.047 %
Cyprus	-0.002 %	-0.001 %	-0.010 %
Czech Republic	-0.032 %	-0.033 %	-0.083 %
Denmark	-0.008 %	-0.003 %	-0.021 %
Germany	-0.027 %	-0.023 %	-0.090 %
Spain	-0.014 %	-0.012 %	-0.071 %
Estonia	-0.012 %	-0.009 %	-0.022 %
Finland	-0.050 %	-0.044 %	-0.183 %
France	-0.011 %	-0.010 %	-0.053 %
United Kingdom	-0.022 %	-0.020 %	-0.097 %
Greece	-0.006 %	-0.005 %	-0.033 %
Croatia	-0.022 %	-0.023 %	-0.060 %
Hungary	-0.009 %	-0.008 %	-0.017 %
Ireland	-0.009 %	-0.004 %	-0.018 %
Italy	-0.019 %	-0.017 %	-0.088 %
Lithuania	-0.011 %	-0.008 %	-0.019 %
Luxembourg	-0.019 %	-0.021 %	-0.032 %
Latvia	-0.011 %	-0.009 %	-0.033 %
Malta	-0.005 %	-0.004 %	-0.012 %
Netherlands	-0.023 %	-0.015 %	-0.055 %
Poland	-0.029 %	-0.024 %	-0.074 %
Portugal	-0.003 %	-0.002 %	-0.015 %
Romania	-0.051 %	-0.036 %	-0.183 %
Slovakia	-0.018 %	-0.015 %	-0.035 %
Slovenia	-0.031 %	-0.031 %	-0.078 %
Sweden	-0.050 %	-0.043 %	-0.160 %
Brazil	0.004 %	0.004 %	0.048 %
China	-0.001 %	0.003 %	-0.021 %
India	-0.024 %	-0.012 %	-0.215 %
Japan	-0.004 %	-0.001 %	-0.069 %
Russia	-0.100 %	-0.061 %	-0.401 %
Turkey	-0.034 %	-0.030 %	-0.219 %
US	-0.024 %	-0.001 %	-0.153 %

Source: Own elaboration.

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