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ABSTRACT

Retaliation Against Trump's Trade War: Why and How the EU Should Find Alternative Export Markets

In retaliating against Trump's March 2025 imposition of import tariffs on EU aluminum and steel, the EU's response should be twofold: one, at the EU level, to apply retaliatory tariffs and negotiations, and two, to support country-level efforts to minimize the impact of tariffs, including external substitution. We point out that the EU does not, however, at present seem to explicitly consider external substitution, i.e. finding alternative export markets. We show why this is an omission, and use the case of the Netherlands to illustrate how to find alternative export markets and how this can bolster the EU's retaliation effort. Our empirical modelling finds that while most of the Netherlands' exports to the USA are at low-to-medium risk, a smaller portion is at high risk. For aluminum and steel products, the high-risk products face exports-at-risk of US$ 245 million, much lower than some current estimates. For these, we identify alternative export opportunities outside the USA and EU. The USA's trade policies could push the Netherlands and the wider EU towards closer economic ties with other global players, potentially weakening the USA's geopolitical standing.

JEL Classification: F10, F13, F1, F17

Keywords: trade wars, USA tariffs, Trump tariffs, EU, export diversification

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1 Introduction

President Donald Trump's first term was marked by the ignition of trade wars,[1] primarily in the form of tariffs on imports. For instance, in 2018, he imposed tariffs of 25 per cent on steel imports and 10 per cent on aluminum imports from the EU, Canada, and Mexico, justified as being in the national interest under Section 232 of the Trade Expansion Act of 1962 (Rockwell, 2025; Starcevic and Ewing, 2025). The EU retaliated by imposing politically targeted tariffs on a range of US products, including Harley-Davidson motorcycles, Levi's jeans, and bourbon whiskey (Fetzer and Schwarz, 2021). It also filed a complaint with the WTO, arguing that the US steel and aluminum tariffs were illegal under WTO rules.[2] In 2021, the EU temporarily suspended these after negotiations with the Biden Administration, which lifted the Trump administration's 2018 tariffs (Rockwell, 2025).

However, soon after the start of his second term, in 2025, Trump reimposed import tariffs against the EU, declaring that "The European Union has treated us so terribly" (Starcevic and Ewing, 2025). This includes tariffs of 25% on aluminum and steel imports from the EU, from 12 March 2025 (Swanson, 2025). Hence, the next chapter in the US-EU trade war has started. According to calculations by Evenett and Fritz (2025), the EU has over US$ 20.3 billion in exports at risk, where "at risk" is measured by the simple value of the USA's imports of these goods.

On 13 March, the EU responded by reinstating the 2018 retaliatory tariffs - the 2022 suspension of the 2018 tariffs will be allowed to lapse on 1 April 2025. In addition, the EU announced[3] that it will be "putting forward a package of new countermeasures on US exports. They will come into force by mid-April, following consultation of Member States and

[1] For an overview of all trade-related measures by the Trump administration see Bown (2025): "Trump's trade war timeline 2.0" at: `https://www.piie.com/blogs/realtime-economics/2025/trumps-trade-war-timeline-20-date-guide`.

[2] See: `https://ec.europa.eu/commission/presscorner/detail/en/ip_18_4006`.

[3] See: `https://ec.europa.eu/commission/presscorner/detail/en/ip_25_740`.

stakeholders."

The consultation with Member States and stakeholders is necessary since, in terms of Regulation 654 of 2014 in the decision on retaliatory tariffs, the EU should consider the "availability of alternative sources of supply for the goods or services concerned." Hence, the EU's approach to the tariff war consists of limited tariffs targeted politically and consideration of internal substitution. Thus, the EU is not considering external substitution as a further response to minimize the economic damage caused by Trump's tariffs. The EU is not considering finding alternative export markets for its aluminum and steel products threatened by USA tariffs.

In this paper, we argue that this is an omission. Member States' consultation would be enriched by determining the extent to which an individual country's exports are at risk from US tariffs and the extent of alternative export markets for those goods. Hence, we recommend that the optimal response for the EU to Trump's trade war should be twofold: one, on the EU level, to take the route leading to retaliatory tariffs while at the same time negotiating with the USA, and two, to support country-level efforts to minimize the impact of tariffs, including external substitution.

If each EU country engages in the latter, it may also strengthen the bargaining position on the EU level, as the EU may offer a more convincing narrative that US tariffs would damage the US more than they would the EU. This is relevant as US tariffs may be used as a bargaining card for the US to obtain concessions for US digital platform firms operating in the EU, or to avoid being subject to the EU's Carbon Border Adjustment Mechanism (CBAM)(Rockwell, 2025; Oxford Economics, 2025).

In this paper, we argue our case for external substitution as a response to Trump's tariffs against the EU by asking how much of the Netherlands' exports are at risk? As an EU member state, the Netherlands is subject to the EU's policy responses - it cannot impose

its own retaliatory tariffs against the US. However, it can determine how much its exports to the USA are at risk, and find alternative export markets for these products - if these exist. In this regard, a secondary research question we try to answer is: How easily can the Netherlands substitute for exports to the USA?

The focus on the Netherlands can be motivated as follows: first, our point is to illustrate a method and approach, not apply it to each one of the 27 EU economies and then present a consolidated 'bottom-up' informed EU-level outcome in this paper (which is left as a future task). Second, the Netherlands is an appropriate case study or example to use as an illustration, given that it is the US's second-largest trading partner in the EU after Germany and given that the Netherlands has an estimated US$ 1,3 billion in aluminum and steel exports at risk according to the simple estimate of Evenett and Fritz (2025).

We answer the questions posed above using the CEPII BACI (2025 release) reconciled UN COMTRADE data on a Harmonized System (HS) six-digit level to calculate for each product for the Netherlands its Revealed Comparative Advantage (RCA) and Revealed Trade Advantage (RTA) and creating a matrix based on these indicators for how "at risk" a particular export product is to tariffs. The reasonable assumption is that for products for which the Netherlands internationally has a comparative advantage ($RCA >= 1$) as well as a trade advantage ($RTA > 0$), it would be relatively more difficult for the US to switch demand to other producers, and *vice versa*. Then, once we have identified the export products at risk, we use the *AEXI Market Finder*,[4] a software that filters export opportunities with its roots in the decision-support model methodology proposed by Cuyvers et al. (1995). This identifies the untapped export potential from a particular home market's perspective (the Netherlands) on a product by target market (country) basis. In the present case, we focus specifically, as a concise illustration, on aluminum and steel goods exports from the Netherlands most at risk from the 25% tariffs that the USA will apply as of 12 March 2025. We

[4]See `www.aexi.nl`.

need to stress at the outset that we do not provide an forecast or estimate of the economic damages that the USA's tariffs on imports from the EU will cause both itself and the EU (and other trading partners); instead we show that only using the total value of exports or imports as being at risk, or as some measure of risk, is too rough a measure, and that by also considering the market power of a country in a particular good, as reflected in its comparative advantage, provides a more nuanced conclusion - one that moreover can help point a country into how to design complementary retaliatory measures, such as export diversification.

The rest of the paper proceeds as follows. Section 2 provides an overview of relevant existing research. Section 3 describes the methodology and data used in the analysis, focusing on the method used to determine which of the Netherlands' exports to the USA are most vulnerable to the imposed tariffs, describing how new export opportunities can be identified, and outlining the data used. Section 4 presents the results of applying the RCA and RTA analysis to the Netherlands' exports to the USA. Section 5 identifies potential alternative export markets for the goods identified as being at risk from the recent March 2025 USA tariffs, specifically aluminum and steel products. Section 6 concludes.

2 Relevant Literature

According[5] to Donald Trump, the word tariff is "the most beautiful word in the dictionary." He, and no doubt many other politicians across the world, is attracted to import tariffs because it can be a potentially useful instrument to"manipulate the terms-of-trade, shift profits away from other countries, and protect politically influential industries" (Ossa, 2014, p.4104). In the trade wars ignited by Trump in his first presidency, and continued in 2025 after he started his second term, these three objectives have been stated explicitly: the US wants to manipulate its terms of trade to make other countries pay, shift profits from indus-

[5]See: `https://www.newsweek.com/trump-cant-stop-talking-about-tariffs-michigan-roundtable-1971565`.

tries in Europe, Canada, Mexico, China and elsewhere, such as from steel and automotive and pharmaceutical industries, and moreover provide patronage to industries supporting his presidential bid, including the big tech industry that is facing regulatory and competitive pressures from the EU and China.

Tariffs can successfully achieve these objectives under certain conditions. Since the influential paper of Johnson (1953), a large literature has developed on the topic of so-called optimal tariffs and tariff wars, and under what conditions a country can increase its welfare by imposing unilateral tariffs against imports from another country. Johnson (1953) showed that a country could gain from imposing tariffs under certain conditions, particularly if it has sufficient market power in the goods under consideration. With sufficient market power, a country can, as Trump aims to do, alter the terms of trade in its favor, "making foreigners pay part of the tariff" (Beshkar and Bond, 2019).

Subsequent research has modified Johnson's insights by showing that a more nuanced consideration of the complexities of the political economy of tariffs makes the calculation of whether tariffs will be welfare-enhancing not so straightforward. This research has shown that other relevant dimensions include the nature of market structures, the difference between static and dynamic effects of tariffs, and the role of multinational trade agreements in fostering cooperation rather than unilateral trade policies.

Nevertheless, the insight that perceived economic power plays in trade policy has not been lost. Ossa (2014, p.4104) calculates, using a multi-country, multi-industry general equilibrium model of international trade, that a country "can gain considerably at the expense of other countries by unilaterally imposing optimal tariffs. In the complete version with lobbying, the mean welfare gain of the tariff imposing government is 1.9 percent, the mean welfare loss of the other governments is 0.7 percent, and the average optimal tariff is 62.4 percent." A condition for this favorable result is that the imposing country faces no retaliatory tariffs. With retaliatory tariffs, however, a country can lose a trade war, and as Ossa (2014) shows,

everyone may end up being worse off. This result underpins the sensibility of trade talks and the progress made in the past (and currently under threat) through multilateral trade agreements (Beshkar and Bond, 2019).

Therefore, it is essential for countries on which unilateral tariffs have been imposed to consider retaliation in one form or another. This can significantly reduce the moral hazard that a country unilaterally imposes a tariff on another country, potentially strengthening its bargaining position.

The first tool for retaliation is to try to apply an external enforcement mechanism, such as the World Trade Organization (WTO). Indeed, trade agreements such as the WTO and others (e.g., NAFTA, EU) have been important in the past for reducing tariff protection worldwide (Beshkar and Bond, 2019).

A second and simultaneous retaliatory move is to impose a retaliatory tariff on the country that initiated a tariff or tariffs. In deciding on the design of this retaliatory tariff, a country needs to have two aims: the first, to raise the cost for the initiating country and the second, to limit the economic damages that it may suffer as a result of the imposition of the import tariff. If it can succeed in raising the costs for the tariff-initiating economy (which will depend on many country and industry-specific characteristics) and if it can succeed simultaneously in limiting the cost on its own economy from the tariff, then it may win the tariff war. Limiting the cost to its own economy from imposing a tariff strengthens its responses' time consistency and credibility.

Fetzer and Schwarz (2021) discuss how the EU adopted all these tools in the trade war that Trump started in March 2018 when he imposed tariffs on steel and aluminum imports from the EU. For instance, the EU retaliated by imposing tariffs on a range of US products, including Harley-Davidson motorcycles, Levi's jeans, and bourbon whiskey. Fetzer and Schwarz (2021) showed that in selecting these products for tariffs, the EU politically targeted counties

in the US that supported Trump: "counties that are more exposed to retaliatory tariff had higher levels of support for Trump in the 2016 presidential election" (Fetzer and Schwarz, 2021, p.1725). This political targeting reflects that the EU aimed to limit the damage to its own economy by carefully selecting tariffs that could put domestic political pressure on Trump.

The EU has also retaliated against the 2018 US tariffs by appealing to the World Trade Organization (WTO). In June 2018, the EU filed a complaint, arguing that the US steel and aluminum tariffs were illegal under WTO rules.[6] In January 2022, following the Biden Administration's scrapping of the tariffs on steel and aluminum, the EU suspended its retaliatory tariffs and the WTO dispute was terminated.[7]

Soon after the start of his second term, in 2025, Trump reimposed tariffs against imports from the EU, declaring that "The European Union has treated us so terribly" (Starcevic and Ewing, 2025). This includes announcing tariffs of 25% on aluminum and steel imports from the EU from 12 March 2025 (Swanson, 2025). Hence, the next chapter in the US-EU trade war has started. According to calculations by Evenett and Fritz (2025), the EU has over US$ 20,3 billion of exports at risk - where they calculate "exports at risk" as the potential loss of all the exports of affected products to the USA (the implicit assumption is the price elasticity of demand for these products in the USA is infinite).

On 13 March, the EU responded, essentially reinstating the 2018 retaliatory tariffs - the 2022 suspension of the 2018 tariffs will be allowed to lapse on 1 April 2025. In addition, the EU announced[8] that it will be "putting forward a package of new countermeasures on US exports. They will come into force by mid-April, following consultation of Member States and stakeholders."

[6]See: https://ec.europa.eu/commission/presscorner/detail/en/ip_18_4006.
[7]See: https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds548_e.htm.
[8]See: https://ec.europa.eu/commission/presscorner/detail/en/ip_25_740.

The consultation with Member States and stakeholders is necessary since, in terms of Regulation 654 of 2014, the EU has to minimize the economic damage to the EU and serve to impose an effective cost on the US. Thus, in this, the EU will consider the extent to which imports potentially taxable from the USA are strategic and whether alternative sources of supply are available. The complexity of stakeholder consultations should be recognized. The EU consists of 27 heterogeneous economies, some of which will be more damaged by US tariffs than others.

Apart from the challenge of finding consensus on further retaliatory tariffs, leaving the response to trade wars to the EU alone risks more economic damage to individual countries than if they would, based on the nature of their own trade and production capabilities, also respond on the country level. One way of doing this would be to determine the extent to which an individual country's exports are at risk from US tariffs and the extent of alternative export markets for those goods. This approach can be justified with reference to a strand of literature related to retaliatory tariffs, namely the literature on economic sanctions. (Kavaklí et al., 2020, p.898) draw on this literature to argue that "sanctions are costly for both sides, and both the target and sanctioner will take steps to minimize their own costs while maximizing the other side's costs" and that this will entail "a combination of external and internal substitution." Similar considerations apply to the case of a tariff war: the EU should minimize its own costs while maximizing the USA's cost and strengthening its bargaining position.

So far, however, it is clear that the EU's approach is mainly considering limited tariffs targeted politically and consideration of internal substitution, in other words, consultation to determine where imports from the USA can realistically be sourced domestically in the EU. This is what the internal consultations with Member States will involve. This is because EU Regulation 654, 2014 clearly states that in the decision on retaliatory tariffs, the EU should consider the " availability of alternative sources of supply for the goods or services

concerned."

It is clear from the discussion that the consideration of external substitution is not on the EU's agenda. The EU is not considering finding alternative export markets for its aluminum and steel products threatened by USA tariffs. In this paper, we argue that this is an omission. Member States' consultation would be enriched by determining the extent to which an individual country's exports are at risk from US tariffs and the extent of alternative export markets for those goods. Hence, we recommend that the optimal response for the EU to Trump's trade war should be twofold: one, on the EU level, to take the route leading to retaliatory tariffs while at the same time negotiating with the USA, and two, to support country-level efforts to minimize the impact of tariffs, including external substitution.

If each EU country engages in the latter, it may also strengthen the bargaining position on the EU level, as the EU may offer a more convincing narrative that US tariffs would damage the US more than they would the EU. This is relevant as it has been argued that the US tariffs may also be imposed as a bargaining card for the US to obtain concessions for US digital platform firms operating in the EU or to avoid being subject to the EU's Carbon Border Adjustment Mechanism (CBAM) (Rockwell, 2025; Oxford Economics, 2025).

3 Methodology and Data

3.1 Identification of Exports at Risk

Evenett and Fritz (2025) calculate the exports at risk from USA tariffs on aluminum and steel simply as the value of the US's imports of these goods in 2024. Thus, they report that the USA imported $20,3 billion of these products (across 289 product categories) from the EU 27 in 2024. The top three EU sources were Germany, France, and the Netherlands.

Taking simply the amount of USA imports from the EU (or EU exports to the US) as the estimate of exports at risk assumes that all demand from the USA will cease or shift elsewhere, in other words, it assumes that the EU is not a competitive supplier of the product and/or the demand in the USA is infinitely price elastic. It does not consider that in all or many of these products, the EU may be internationally competitive, to the extent that the demand in the USA would be price inelastic, and that competitive EU products may not still be delivered but through third-party countries, as happened during Trump's 2018 trade war against China when the latter country continued exporting to the USA via Mexico. Generally speaking, it is not in a country's interest to levy tariffs or sanctions in a trade war against products in which a country has a comparative advantage (Kavaklí et al., 2020).

Hence, we use a less crude method to estimate the exports at risk. Instead of using the total value of exports in a year, we calculate the time-weighted[9] Revealed Comparative Advantage (RCA_{tw}) and the Revealed Trade Advantage (RTA_{tw}) of a country in each of the different aluminum and steel products on which the USA has levied import tariffs. The justification is based on the arguments provided by Fetzer and Schwarz (2021) and Kavaklí et al. (2020), who study the political economy of trade wars and sanctions. According to Fetzer and Schwarz (2021, p.1735), tariffs on goods in which the targeted country has a comparative advantage will tend to be less successful.

Revealed Comparative Advantage (RCA) is a metric used in international trade to assess a country's relative advantage or disadvantage in producing a particular good or service, based

[9]The approach also considers volatility in international trade data by applying a time-weighted smoothing approach. The fundamental premise is that transactions occurring in the more distant past are less likely to influence current decisions and information. Therefore, a "discount" is applied to the contribution of each historical data point based on how far back the point is in terms of time relative to the latest point. Various weighting schemes can be applied for this purpose, depending on how fast one would want the historical influences to diminish. For the applied modeling initiative, a near exponential weighting scheme is applied where the most recent value is allocated a weight of 1, and the preceding historical points are each allocated a weight of 0.5 of the previous weight and then normalized. Data for the latest 6 years of annual reported trade statistics and other variables are used when calculating growth rates, shares and time-weighted values. This allows for the identification of RCA's and RTAs, where the Netherlands, on a sustainable basis, exhibits these comparative advantages.

on its relative export performance (French, 2017). The most common formula for calculating RCA is the Balassa Index (see Balassa (1965)):

$$RCA = (\frac{X_i c}{X_i t})/(\frac{X_w c}{X_w t}) \tag{1}$$

Where $X_i c$ = value of country $i's$ exports of product

$X_i t$ = total value of country $i's$ exports

$X_w c$ = world exports of product c

$X_w t$ = total world exports

In other words, the RCA in exports is the ratio of the Netherlands' share of exports in a particular line of products against the world's share of exports in the same product lines. If the $RCA > 1$, then the Netherlands has a revealed comparative advantage in that product. However, if $RCA < 1$, it has a revealed comparative disadvantage in that product.

We will also apply the Revealed Trade Advantage (RTA) indicator, due to Vollrath (1991), as a further metric in the modeling. This indicator can be explained as follows: The Netherlands is a transit country for many goods going into Europe and other regions. Re-exports are a significant part of total exports in the Netherlands. Indeed, in 2022, the value of re-exports exceeded domestic exports.

While the RCA indicates a comparative advantage, it only accounts for exports (irrespective of the origin – domestically produced or imported – of such exports). By ignoring imports, the RCA measure can give a distorted picture of The Netherlands' true trade advantage. For example, the Netherlands might have a high RCA for a product, but it might also import a large quantity of the same product. This suggests that the country's actual trade advantage in that product might be weaker than what the RCA measure in isolation indicates. Detailed data per product HS code according to how much is locally produced and re-exports in the

Netherlands are not available (only on STC level 1). However, an indirect measure of how likely an export is to be a re-export or locally produced can be obtained by calculating the Revealed Trade Advantage (RTA).

The RTA index accounts for exports and imports simultaneously and is used to indicate product-level competitiveness and domestic productive capacity. An $RTA > 0$ reveals a positive comparative trade advantage or trade competitiveness. This means that, in relative terms, the country is exporting more of the product than it imports. If this is the case, the country must produce the product locally. It can be assumed that an $RTA > 0$ implies that the majority of the product exported is locally produced. Imported 'stockpiling' and selling in later periods can lead to 'misreading' based on annual calculated RTAs. To mitigate this aspect, the time-weighted approach previously mentioned helps to filter out such occurrences.

The RTA is calculated using the following mathematical expression:

$$RTA = RCA_{ij} - RMA_{ij} \tag{2}$$

Where RCA is as defined in (1) and

$$RMA_{ij} = \left| (\frac{M_{ij}}{\Sigma_t M_{it}}) / (\frac{\Sigma_n M_{nj}}{\Sigma_n \Sigma_t M_{nt}}) \right| \tag{3}$$

Where

Where:

X_{ic} = value of country $i's$ exports of product c

X_{it} = total value of country $i's$ exports

X_{wc} = world exports of product c

X_{wt} = total world exports

M = imports; and i is a country, j is a product, t is all traded products, and n represents all countries.

If $RTA > 0$, export has a higher comparative advantage than import (relatively more is exported of the product than imported when compared to the world average); If $RTA < 0$, import has a higher comparative advantage than export (relatively more is imported than exported when compared to the world average). An $RTA > 0$ on a consistent basis over time can therefore be assumed to indicate that most of the product exported is locally produced.

In sum, in using the RCA and RTA (respectively indicated as RCA_{tw} and RTA_{tw} when referring to the actual values calculated over a 5-year window for 2019-2023), we imply that export products from the Netherlands to the USA will be more at risk if the Netherlands do not have an RCA or RTA in the particular product - for these goods, the rise in price due to the tariff will most likely lead to demand from the USA dropping. Conversely, for products with combined high RCAs and RTAs, it will be more difficult for USA buyers to source from elsewhere.

3.2 Identification of Export Opportunities

Easterly et al. (2009, p.4) raised an important question regarding the identification of export opportunities: "Our analysis raises a new issue. In addition to the possible knowledge externality to a successful export, there is also a knowledge problem about the discovery itself. Who is more likely to discover the successful product-destination category: the public or private sector?"

They argue that the private sector, through entrepreneurial discovery as also proposed by Hausmann and Rodrik (2003) and Hausmann et al. (2007) would be best to find a big hit in terms of product-destination combinations, but qualified this by recognizing that "in the

end it is an empirical question which approaches work."

Whether it is the private sector or the government discovering successful export opportunities ("the successful product-destination category") the question is how would they go about doing so? We believe that a greater use of big data, which traditionally was not available in such a way as to assist decision-making and export opportunity recognition, can play an important – even essential role. This is clear when one considers the fact, pointed out by Armenter and Koren (2014, p.2127) in their "balls and bins" model, that "The recent availability of finely disaggregated trade data has spurred fast-growing research that documents the extensive margin in trade" and moreover that this finely disaggregated data shows that trade data (export-destination combinations) are "sparse." For instance, analogously to Easterly et al. (2009) they point out Armenter and Koren (2014, p.2128) that "There were about 22 million export shipments originating in the United States in 2005 - and thus the same number of observations. At the same time, there are 229 countries and 8,867 product codes with active trade, so a shipment can have more than 2 million possible country-product classifications. More than 40 percent of the traded country-product pairs had only one or two shipments during the year, a clear sign that the data are sparse". The sparseness of the actual export data, as compared to the potential data if more "balls" fall into more "bins" is suggestive of unutilized export opportunities.

The question is, how can the existing "sparse" data be used to identify possible new product-country combinations of export opportunities for aluminium and steel products for The Netherlands? The answer is that although the data may be "sparse' from a particular country's point of view, the data is not that sparse from all countries' points of view. Thus, while the Netherlands may export product s to country d, and not product q, it may be the case that Spain, or some other country, does indeed export product q to country d. This provides spillover knowledge that may, or may not be, useful to the Netherlands. This property or feature of global trade data, as captured in the UN-COMTRADE database and

refined in the CEPII BACI data set, is what we exploit in the AEXI Market Finder's model described in the next sub-section.

3.3 Model Description

The basic aim of the of the model we use is to bridge the information gap described above and contribute to the identification of realistic export opportunities based on a process of 'filtering' or 'overlaying' data. The challenge of big data and many potential combinations discussed in the preceding sections is addressed by reducing the potential set of options (balls and bins) that need to be selected based on well-researched filters relevant to a particular question. The approach takes into consideration all possible worldwide product (HS 6-digit) and market (country) combinations, using four major filter categories containing various sub-filters applied consecutively. The approach systematically eliminates less-promising markets until those with the greatest prospects of success are revealed.

These filters are briefly described, drawing on Naudé and Cameron (2021). A full description is to be found in Pearson et al. (2010) and Cuyvers et al. (2012). The first filter (Filter 1) considers broad general market potential as reflected in economic size, growth, and political and commercial risk. Key variables considered in this filter include GDP and GDP per capita values as well as annual growth rates of these variables, as well as country risk ratings.[10] The main filter consists of two sub filters. The primary aim of the first (sub-filter 1.1) is to eliminate markets that pose too high a relative political and/or commercial risk. The second (sub-filter filter 1.2) considers relative macro-economic size or growth. The overall rationale for Filter 1 is to reduce the set of countries that need to form part of the export potential investigation in the subsequent filters.

The second filter (Filter 2) classifies all potential product-market combinations' import

[10]Originally from the Belgian public credit insurance agency, Office National du Ducroire (ONDD), now the Credendo Group as the ONDD rebranded in 2013.

demand characteristics (determined through relative size and growth trends). Three key descriptive quantitative characteristics of import demand patterns are calculated for each product x country combination in this filter, namely short-term import growth (last 2 years), long-term import growth (over the last 5 years) and relative import market size.

The third set of filters (Filter 3) considers product-country market access conditions. Cuyvers et al. (1995, p.180) recognize that simply being selected on the basis of size and growth does imply that a market can easily be penetrated. There are 2 main categories of trade barriers identified in this filter. The first (filter 3.1) is that of the degree of import procurement supplier (import source markets) concentration.[11] while the second is that of trade restrictions (filter 3.2) (Cuyvers et al., 1995, p.180). Hoekman and Nicita (2008, p.17) found that the logistics performance index (LPI) score as published in the World Bank Doing Business (WBDB) Surveys (World Bank, 2016), the Doing Business cost to import measures and *ad valorem* equivalent[12] tariffs per product[13] are important measures of market access. Filter 3.2 therefore considers transport and logistics costs elements (converted to comparable *ad valorem* equivalent terms) through explicit assumptions regarding transport and logistics dimensions such as international shipping time and cost per country, domestic time and cost to import and the LPI. The above-mentioned components are brought together as a market accessibility index that provides a score for each unique product-country combination relative to all other product-country combinations included in the analysis.

In the final step (Filter 4) each individual product-market combination is categorized based on the home market's current exports and the target market's size, growth patterns and accessibility as well as the home market's current revealed comparative advantage (RCA) and revealed trade advantage (RTA) (Cuyvers, 1997). The potential export markets are

[11] By making use of an adjusted Herfindahl-Hirschmann Index of Hirschmann (1964).

[12] An *ad valorem* equivalent tariff is defined as a tariff presented as a percentage of the value of goods cleared through customs and is calculated as the rate comparable with a tariff derived from unit quantities such as weight, number or volume (ITC, 2020).

[13] Obtained from the ITC's Market Access Map (MacMap).

also further categorized according to the home market's current export performance in these markets compared to the performance of the top six competitors in each market.

Finally, a monetary value indicator is then calculated to distinguish the relative size of unconstrained and untapped potential export value to prioritize the shortlisted export opportunities (product and target market combinations). This untapped potential export value is considered as the average market import value of the top six competitors in each market, excluding imports from the home market if such market happens to be one of the top six sources of imports for the target market for a given product. The unconstrained qualifier refers to the fact that the potential is not constrained by production or supply constraints from the perspective of the home (exporting) market. These variables are all calculated in a time-weighted index format to address data volatility issues.

Since policies aimed at increasing the diversity of exports in terms of products versus diversifying destination markets are obviously very different, policymakers need to be correctly informed to use the right tool for the right policy question (Carrère et al., 2020). To this effect, Brenton and Newfarmer (2007) define the expansion of existing products in existing markets as growth at the intensive margin, while the introduction of new products and new geographic markets as growth at the extensive margins indicates that policies need to be sensitive to these objectives.

In line with informing such objectives, a key aspect of our methodology is its ability to address both the intensive and extensive margin dimension of the export promotion and development challenges. The method offers alternative target markets to current exporters that are facing saturation and/or declining growth in their traditional markets, while also being able to identify possible new products that could be used to inform investment and industrial policy decision making.

3.4 Data

The international trade data that inform the analysis and modeling outcomes as applied in this study are based on the "Base Analytique du Commerce International" (BACI) data set, which is a reconciled version of the UN COMTRADE merchandise trade database provided by CEPII (Centre d'Études Prospectives et d'Informations Internationales, 202501 version).

According to CEPII, the BACI-reported export values exclude re-exports, unlike the usual international trade data such as UN Comtrade. Similar (but different in the detail) to the ITC, CEPII applies a data verification and adjustment process to assess the reliability of reported trade flows.[14] This is important in the present case of the Netherlands, where re-exports constitute a significant share of total exports.

One of the key advantages of basing the modeling[15] on the BACI data set is that it offers the richness of the UN Comtrade database (in terms of number of countries, time periods, disaggregated product level), but with the added advantage of significantly reducing the number of missing values since the global flows are supplemented by considering partner or mirror reporting. Whilst it does not reflect 'formally' reported trade flows for all countries, the 'synthetic' set created does allow for a more up to date and realistic view of global trade flows and provides more comprehensive coverage and analysis capabilities.

[14] More details on this approach can be found in Gaulier, G. & Zignago, S. 2010. BACI: International Trade Database at the Product Level. The 1994-2007 Version. CEPII Working Paper, N°2010-23, October 2010. https://www.cepii.fr/CEPII/fr/publications/wp/abstract.asp?NoDoc=2726, Date of access: 12 Mar. 2025.

[15] Other data elements employed in the methodology are obtained from various sources including the United Nations macro-economic database (GDP, per capita income, exchange rates, population estimates), Credendo (country operational risk evaluations), International Trade Centre (ITC) Market Access Map (MacMap) (tariffs), various shipping liner companies such as Maersk, Mediterranean Shipping Company (MSC), CMA-CGM, China Ocean Shipping (Group) Company (COSCO) and Pacific International Lines (e.g. for East Africa), Searates.com, WorldFreightrates.com, Google, World Bank Doing Business and Container Trade Statistics (CTS) for container shipping cost indices.

4 Exports at Risk

In section 3.1 we described our approach to estimate the Netherlands' exports at risk from USA tariff increases. While the most tariffs are on aluminum and steel products, we calculate all the exports to the US at risk, keeping in mind that it is expected that the USA may impose a general, across the board, ten percent tariff on all goods from the EU (Oxford Economics, 2025). After calculating this for all exports to the USA at risk, we will illustrate how to minimize this risk through export diversification, using the example of aluminum and steel products.

Recall from section 3.1 that given for every good we calculate a RCA_{tw} and a RTA_{tw} (at the HS 6-digit tariff code level), and there are four possible combinations for each good:

$RCA_{tw} >= 1; RTA_{tw} > 0$: for these the risk posed by tariffs is labeled to be of low risk. The country is highly internationally competitive in exporting this product and has an overall trade advantage. It means the country is good at producing and selling this product internationally, and it's benefiting from this trade.

$RCA_{tw} >= 1; RTA_{tw} < 0$: for these the risks posed by tariffs is labeled to be of medium risk. The country is good at exporting this product, but overall, it is importing more than it is exporting. It might mean the country is part of a global supply chain, where it's good at one part of the production process but relies on imports for other parts. Alternatively, the country provides 'aggregation' or value-added product enhancements and distribution, but mainly from imported products such as e.g. cut-flowers or other plant-material that are imported and re-packaged and then sold via exports.

$RCA_{tw} < 1; RTA_{tw} > 0$: for these the risks posed by tariffs is labeled to be of high risk. Although the country isn't particularly good at exporting this product compared to the world average, it still manages to have a trade advantage. This could mean the country has

found a niche market or has other advantages (like location or trade agreements) that help its trade position.

$RCA_{tw} < 1; RTA_{tw} < 0$: for these, the risks posed by tariffs are labeled to be of medium risk. The country is not competitive in exporting this product and is also at a disadvantage in overall trade. It might suggest that the country should consider shifting resources to other sectors where it has better prospects as it is vulnerable in the production and exports of these products.

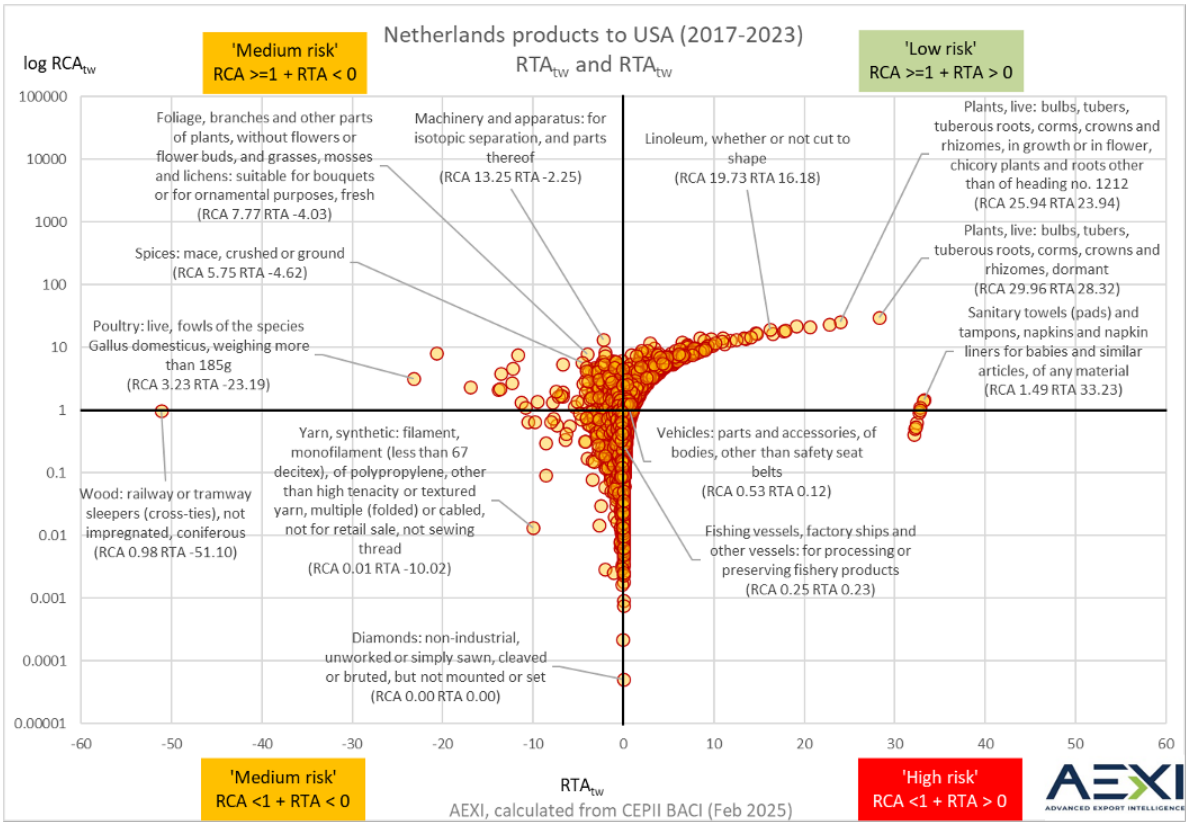
These interpretations provide a simplified view of complex trade dynamics. In reality, many other factors (like domestic demand, government policies, and global economic conditions) also play crucial roles in determining a country's trade position. However, the four combinations allow us to plot the various outcomes across four quadrants, using all exports to the USA per 6-digit level HS code, as in Figure 1.

Figure 1 shows the scatterplot of RCA_{tw} and RTA_{tw} values of all the Netherlands' exports to the US between 2017 and 2023. It can be seen that in the top right-hand quadrant the products that are under the lowest risk of risk from USA tariffs include products in which the Netherlands has both an international export ($RCA_{tw} >= 1$) and trade advantage ($RTA_{tw} > 0$). Examples highlighted in the figure include bulbs, tubers, flowers and linoleum. These are products for which the Netherlands has a high RCA_{tw} and local production capacity, as proxied by the $RTA_{tw} > 0$.

The lower right-hand quadrant shows the high-risk products. These are products for which the Netherlands has a high RTA but a low RCA. This means there is local production, but the goods are not produced with an international comparative advantage. Hence, with tariffs, markets in the US may be lost, implying possible local (Netherlands) job and output losses.

Both the left-hand quadrants contain products for which the risk is medium. This is because

Figure 1: Scatterplot of All the Netherlands' Exports to the USA, 2017-2023 by RCA and RTA



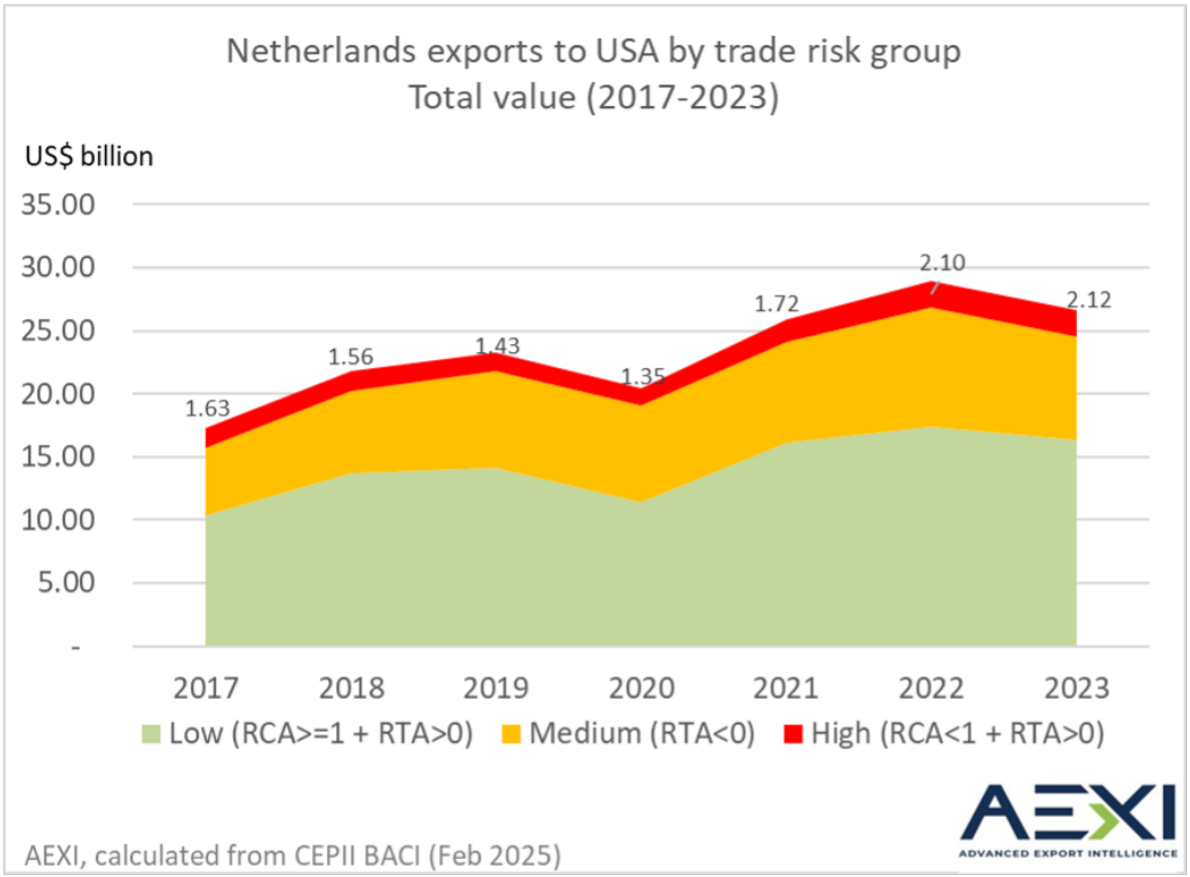
Source: Authors

the Netherlands has a low RTA_{tw} in these products, which implies it may be largely a re-exporter, in which case limited local products or jobs are potentially threatened. In the case where the $RCA_{tw} >= 1$ (top left-hand quadrant) the Netherlands provide value-added and transit or re-export services in an internationally competitive manner - the example shown of foliage products (many different source countries) and spices (Indonesia and Vietnam) illustrates these types of products where the Netherlands probably sources from elsewhere and then exports slightly transformed products from the Netherlands comparatively competitively. The lower left-hand quadrant exhibits products with low comparative export and trade advantage, so input products would be mainly imported, but the export thereof is not comparatively competitive, e.g., rough diamonds (Belgium) and synthetic yarn (Türkiye).

To get an indication of the monetary values at risk, we can plot the value of the Netherlands'

exports to the USA over time, splitting the exports based on their $RCA \times RTA$ classification. This is shown in Figure 2.

Figure 2: Total exports from The Netherlands to the USA by Trade Risk Group, 2017-2023



Source: Authors

Figure 2 shows the exports at low risk in green, in medium risks in yellow, and at high risk in red. Figure 2 implies that the bulk of the Netherlands' exports to the USA is at low/ medium risk, with a relatively small value at risk.

Evident is that the export value of high-risk products increased from around US$ 1.63 billion in 2017 to around US$ 2.12 billion by 2023. Table 1 lists the top 20 products based on 2023 export values from the Netherlands to the USA in millions of US dollars. These top 20 products represent 42% of the value of products included in the identified high-risk set.

5 Alternative Export Opportunities

Given that we have identified in section 4 the exports of the Netherlands that are at risk of USA tariffs, the next step would be to identify potential alternative export markets for these goods. Such an exercise for all the goods identified in section 4 falls however, outside the scope of this paper.

Instead, also since our aim is to provide an illustration, we will focus on the aluminum and steel tariffs that the Trump administration levied in 2025 against the EU. In this section we thus first identify the aluminum and steel products at risk, and then we use the *AEXI Market Finder* methodology as described, to identify untapped export markets outside of the USA for these products.

Evenett and Fritz (2025) list all the aluminum and steel products on which USA tariffs are levied. We have taken this same list and calculated the RCA_{tw} and RTA_{tw} for each product. The results are plotted in Figure 3.

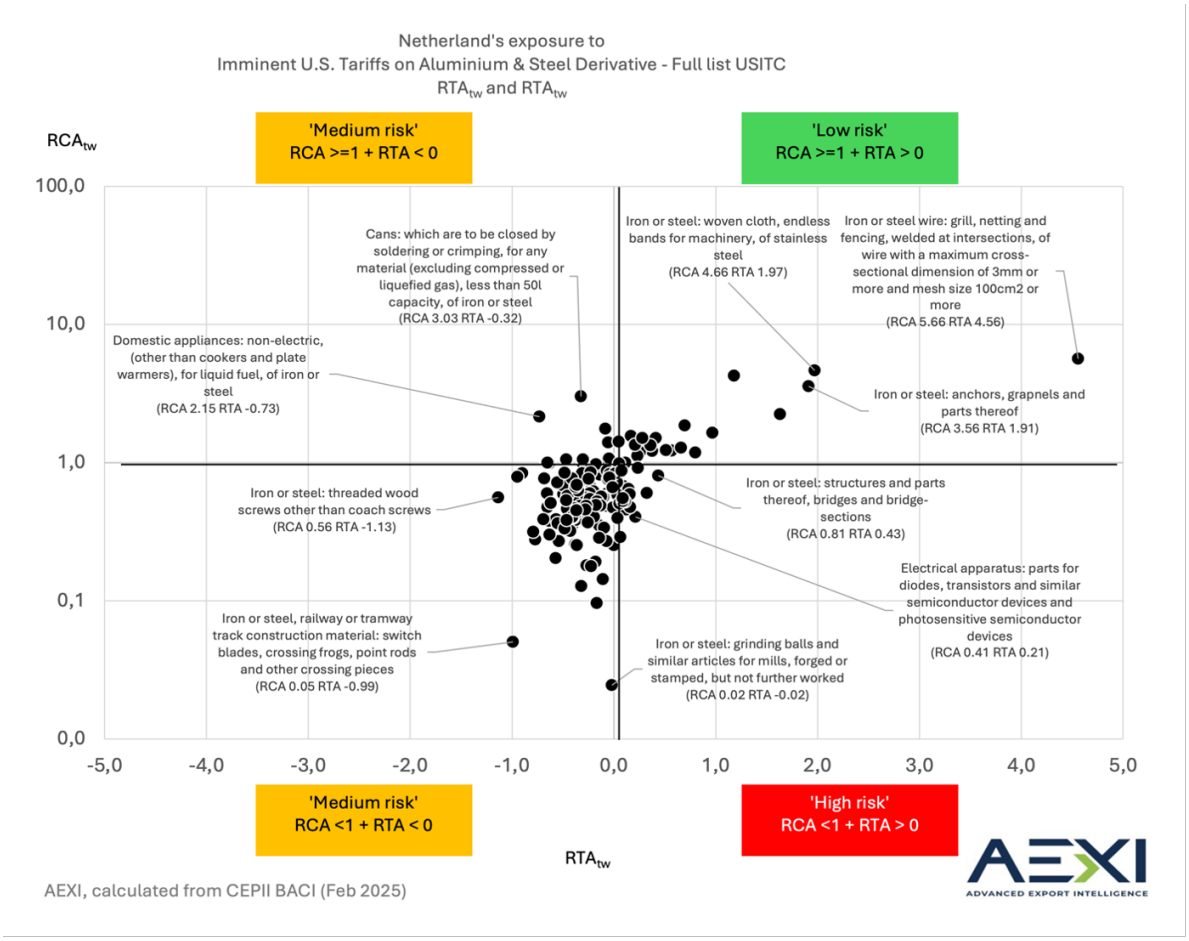
Figure 4 shows that the bulk of the Netherlands' aluminum and steel products are facing a medium risk, quite a few low risk, and relatively small number faces a high risk.

When considering the value at risk based on the above approach applied to the list of goods as per Evenett and Fritz (2025) we find that the high-risk group based on this alternative represents US$ 245 million in 2023.[16] This is substantially less than the exports at risk of US $ 1,3 billion, as estimated by Evenett and Fritz (2025).

Beyond the top 10 high risk products shown in Table 2, the high-risk products also include a further 13 products such as e.g. electrical apparatus: parts of diodes etc; iron or steel

[16]The CEPII BACI 'balanced' trade data only contains values up to 2023, since at the time of writing the complete reported data for all world trade flows by HS 6 digit product level for all countries is not available yet. Note that Evenett and Fritz (2025) uses a snapshot of reported exports for 2024 at a point in time for a subset of countries and the results are therefore not perfectly comparable.

Figure 3: Aluminum and Steel Exports from The Netherlands at Risk from USA Tariffs



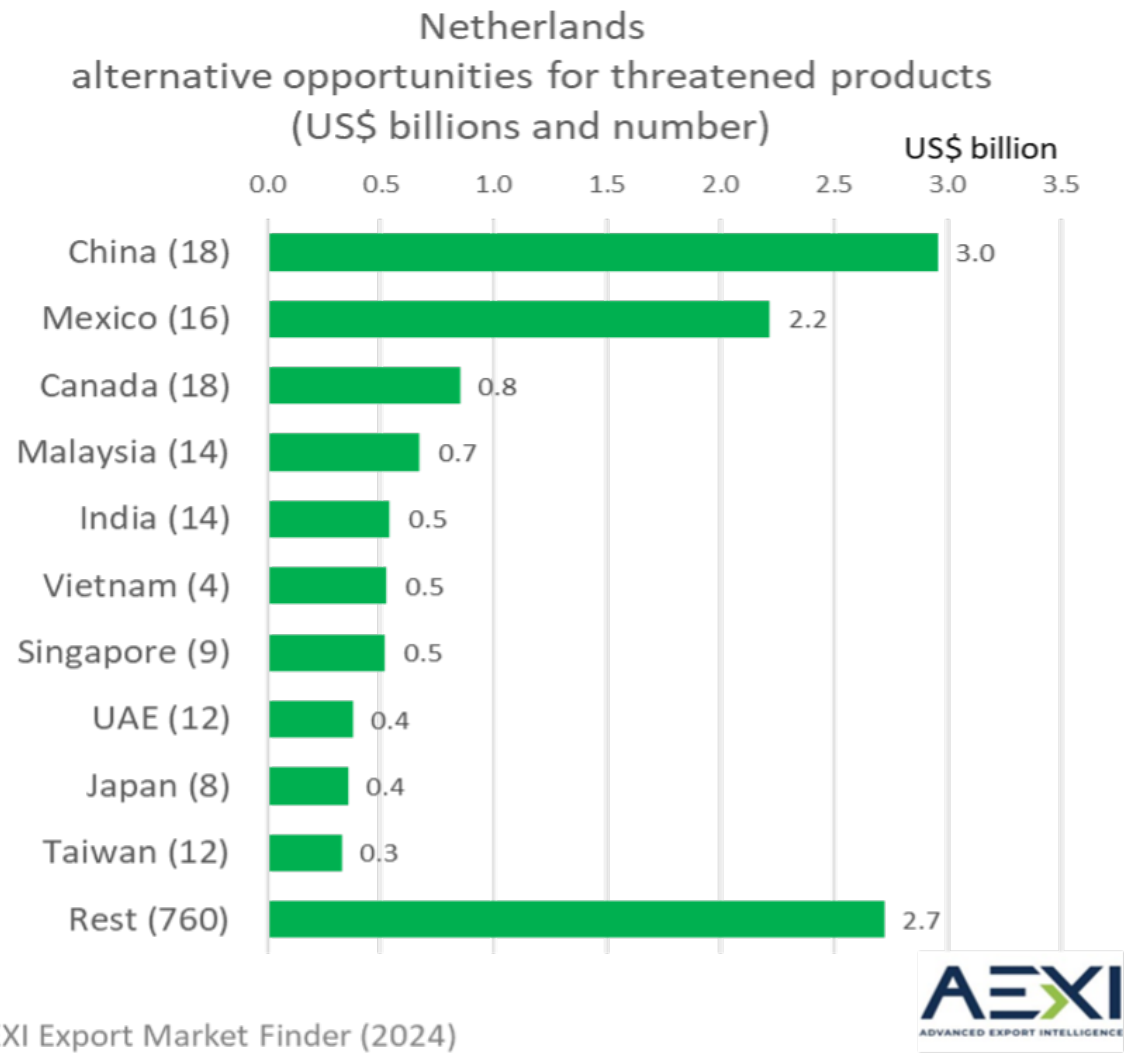
Source: Authors

structures and bridges; and iron or steel grinding balls. Given the low international competitiveness of the Netherlands in these products, it is likely that the industries producing these goods will suffer loss of demand and, eventually, perhaps even loss of output and employment. As such, it would be prudent to identify alternative export markets to minimize the risk.

Using the *AEXI Market Finder* algorithmic filtering process, the results of alternative markets and the potential export market at each of these markets are shown in Figure 4. We have excluded Europe, the UK, Palestine, and Russia as alternative markets for this evaluation.

Figure 4 shows the top 10 countries that offer the best alternative markets for the Nether-

Figure 4: Diversifying Opportunities for the Netherlands' Exports of Aluminium and Steel Products Most at Risk from USA Tariffs, US$ and number



Source: Authors

lands' aluminum and steel products most threatened by USA tariffs (the high-risk products). The top markets are China, Mexico, Canada, Malaysia, and India. The total value of these untapped export opportunities is US$12 billion.

The results in Figure 4 have two important implications for the trade war: one, there are sufficient alternative export opportunities for the Netherlands to reduce the harm from the USA's tariffs, and two, the USA's measures are likely to drive the Netherlands (and EU) away from the USA, closer to China and India, and eventually the BRICS, further weakening

the USA's geopolitical position.

6 Concluding Remarks

As part of its response to President Trump's 2025 tariffs on imports of aluminum and steel, the EU is not considering external substitution measures, such as alternative export markets for products threatened. In this paper, we argue that this omission should be addressed. The EU's response should be twofold: one, at the EU level, to apply retaliatory tariffs and negotiations, and two, to support country-level efforts to minimize the impact of tariffs, including external substitution.

We used the case of the Netherlands to illustrate the usefulness of our recommended approach. To this end, we asked, how much of the Netherlands' exports are at risk? and second, how easily can the Netherlands find alternative export markets, and hence reduce the value at risk?

To answer these questions, we employed a methodology based on the analysis of international trade data using the CEPII BACI reconciled UN COMTRADE database. We calculated the time-weighted Revealed Comparative Advantage (RCA) and Revealed Trade Advantage (RTA) for the Netherlands' exports to the USA to assess the risk posed by tariffs. Exports were categorized into low, medium, and high risk based on the combinations of RCA and RTA values. We utilized the *AEXI Market Finder*, an algorithmic filtering process that considers various market-related factors to identify potential alternative export markets for goods facing high risk.

Our findings indicate that while the bulk of the Netherlands' overall exports to the USA between 2017 and 2023 faced low to medium risk, a small portion was categorized as high risk. The export value at risk for these products is US$ 245 million in 2023, which is substantially

less than the exports at risk of US $ 1,3 billion as estimated by Evenett and Fritz (2025). Moreover, we determined that sufficient alternative export markets for these products exist in countries outside the USA and EU, such as China, Mexico, Canada, Malaysia and India, and are valued at around US$ 12 billion. This suggests that external substitution could be a viable strategy to minimize the potential damages of Trump's tariffs on the EU.

Our findings suggest that should the EU complement its current response to Trump's tariffs, which consists of limited politically targeted tariffs and internal substitution by external substitution, the USA's trade policies could inadvertently push the Netherlands, and for that matter the EU more generally towards closer economic ties with other global players such as China and India. This could weaken the USA's geopolitical standing. The fact that the USA seems to be reneging on all its trade agreements means that other disillusioned USA ex-trading partners will also be forced to consider external substitution. For this reason, it is critical that the Netherlands and the EU are proactive with a well-informed pivot strategy to diversify their exports away from the USA.

Table 1: Top 20 high-risk products, 2023 values

Item	Products (HS 6 digit description)	RCA_{tw}	RTA_{tw}	(US$ Mil.)	%
1	Paintings, drawings and pastels: executed entirely by hand, other than drawings of heading no. 4906	0.63	32.27	192.37	9.1%
2	Cyclic hydrocarbons: p-xylene	0.48	0.23	109.40	5.2%
3	Electronic integrated circuits: processors and controllers, whether or not combined with memories, converters, logic circuits, amplifiers, clock and timing circuits, or other circuits	0.58	0.09	108.42	5.1%
4	Turbines: parts of turbo-jets and turbo-propellers	0.45	0.91	89.06	4.2%
5	Machines and mechanical appliances: parts of, those having individual functions	0.91	0.80	75.44	3.6%
6	Plastics: other articles n.e.c. in chapter 39	0.82	0.11	72.18	3.4%
7	Heterocyclic compounds: containing a pyrimidine ring (whether or not hydrogenated) or piperazine ring in the structure, (other than melamine and their derivatives), malonylurea, mecloqualone, methaqualone, zipyridamol, and salts thereof n.e.c. in 2933.5	0.39	0.02	68.29	3.2%
8	Machinery: for filling, closing, sealing, capsuling or labelling bottles, cans, bags or other containers; machinery for aerating beverages	1.00	0.27	67.29	3.2%
9	Machines and mechanical appliances: having individual functions, n.e.c. or included elsewhere in this chapter	0.71	0.06	64.06	3.0%
10	Electric passenger and goods lifts	0.89	0.43	62.04	2.9%
11	Aircraft undercarriages and parts thereof	0.71	0.56	50.69	2.4%
12	Fertilizers, mineral or chemical: nitrogenous, urea, whether or not in aqueous solution	0.86	0.97	48.30	2.3%
13	Optical apparatus and instruments: used solely or principally for the manufacture of semiconductor boules or wafers, semiconductor devices, electronic integrated circuits or flat panel displays; machines and apparatus specified in note 9(C) to this chapter; parts and accessories	0.58	0.08	39.47	1.9%
14	Turbines: parts of gas turbines (excluding turbo-jets and turbo-propellers)	0.80	0.45	35.73	1.7%
15	Machinery: for working rubber or plastics or for the manufacture of products from these materials, n.e.c. in this chapter	0.64	0.18	32.96	1.6%
16	Footwear: parts and accessories of bodies other than safety seat belts	0.65	0.09	32.04	1.5%
17	Copper foil, not backed, of a thickness not exceeding 0.15mm, of refined copper or copper alloys	0.53	0.02	30.85	1.5%
18	Boring or sinking machinery: parts of the machinery of item no. 8430.41 or 8430.49	0.74	0.50	29.04	1.4%
19	Machinery: parts for filtering or purifying liquids or gases	0.45	0.23	29.04	1.4%
20	Blood, human or animal, antisera, other blood fractions and immunological products: antisera and other blood fractions	0.84	0.25	29.04	1.4%
	Rest			884.81	41.7%
	Total			**2,122.49**	**100%**

Table 2: Export Value at Risk based on RCA and RTA, 2023 values

Item	Products (HS 6-digit)	$\mathbf{RCA_{tw}}$	$\mathbf{RTA_{tw}}$	(US$ Mil.)	%
1	Machines and mechanical appliances: parts, of those having individual functions	0.99	0.11	75.44	3.6%
2	Machines and mechanical appliances: having individual functions, n.i.e. or included in this chapter	0.68	0.09	62.10	2.9%
3	Vehicles: parts and accessories of bodies other than safety seat belts	0.53	0.12	32.04	1.5%
4	Electric motors and generators: parts suitable for use solely or principally with the machines of heading no. 8501 or 8502	0.47	0.06	20.11	0.9%
5	Iron or steel: tube or pipe fittings, n.i.e.c. in item no. 7307.99, other than stainless steel	0.59	0.05	16.41	0.8%
6	Vehicle parts and accessories: n.e.c. in heading no. 8708	0.68	0.08	10.53	0.5%
7	Electrical machines and apparatus: parts of the electrical goods of heading no. 8543	0.46	0.12	8.71	0.4%
8	Iron or steel: non-threaded cotters and cotter-pins	0.51	0.06	6.23	0.3%
9	Iron or steel: wire articles	0.87	0.07	3.80	0.2%
10	Optical appliances and instruments: parts and accessories for articles of heading no. 9013	0.72	0.03	2.48	0.1%
			Rest	**6.23**	**0.3%**
			Total high-risk group	**244.50**	**11.5%**
			Total 2023	**2,122.49**	**100.0%**

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