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Abstract
This paper investigates the role of transport and logistics costs as de facto "internal duties" within the European Union, highlighting their impact on the free movement of goods. While formal tariff barriers have been eliminated, frictional costs—arising from distance, infrastructure, and distribution inefficiencies—continue to erode competitiveness and constrain market integration. Using Eurostat COMEXT data and the GTAP social accounting matrix, intra-EU transport margins across six SITC categories and 27 member states are estimated. A Computable General Equilibrium (CGE) simulation of a 50% reduction in intra-EU transport margins suggests aggregate welfare gains of approximately USD 63 billion annually, increased intra-European trade flows, and reduced extra-EU exchanges. The findings underscore the importance of addressing transport and logistics inefficiencies as a priority for EU economic policy, framing them as non-tariff barriers with substantial macroeconomic consequences.

Keywords
European Union; Internal duties; Transport margins; Logistics costs; Non-tariff barriers; Intra-EU trade; COMEXT; GTAP; CGE modeling; Market integration; Distribution costs; Trade policy

JEL Codes
F13, F15, R41, C68, L91

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Freight margins as European internal duties

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ABSTRACT

This paper investigates the role of transport and logistics costs as de facto “internal duties” within the European Union, highlighting their impact on the free movement of goods. While formal tariff barriers have been eliminated, frictional costs—arising from distance, infrastructure, and distribution inefficiencies—continue to erode competitiveness and constrain market integration. Using Eurostat COMEXT data and the GTAP social accounting matrix, intra-EU transport margins across six SITC categories and 27 member states are estimated. A Computable General Equilibrium (CGE) simulation of a 50% reduction in intra-EU transport margins suggests aggregate welfare gains of approximately USD 63 billion annually, increased intra-European trade flows, and reduced extra-EU exchanges. The findings underscore the importance of addressing transport and logistics inefficiencies as a priority for EU economic policy, framing them as non-tariff barriers with substantial macroeconomic consequences.

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1. Introduction

The European Union is "much more than a market", but the European single market remains its *core business* and the most valuable tool at its disposal and that of its member states to strengthen their international competitiveness in a world today subjected to geoeconomic and geopolitical tensions unimaginable until recently. A single European market based on the four freedoms of movement of goods, people, services, and capital, not all of which are yet fully guaranteed.

The free movement of goods, which we are concerned with here, is the instrument that has allowed and continues to allow the gradual unification of the European market for each good. In the sense that every producer of any good, whatever the member state in which it produces it, "may" (is free to) sell his product in any other member state. The consequent increase in the potential scale of the market for each good makes it possible for producers to exploit its economies of scale, which, in markets made more competitive also thanks to the free movement of goods, translate into lower

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prices to the benefit of consumers, whose stimulated demand could lead to further increases in scale with the start of a possible virtuous circle.

A technical limit to the increase in the scale of activity for each producer of each good is given by the distance that must be overcome between the place of production and the place of consumption: the costs of exceeding the distance erode the advantages obtained from the reduction in unit production costs guaranteed by the increase in the scale of activity. The expansion of the market for each good for each producer, therefore, depends, with the same economies of scale achieved in the production phase, on the transport and logistical costs that remain even when tariff barriers between member states have been broken down by virtue of freedom of movement.

The issue of the effective freedom of movement of goods within the Union has recently returned to the center of the economic policy debate, in relation to the presence and incidence of the so-called "internal duties", [4]which – it is argued – we should worry much more about than the duties imposed by other countries, first and foremost by the United States.

Clearly, since the EU is a customs union, it is obvious that the so-called internal duties are not and cannot be, technically, duties. On the other hand, in the face of excessively generous quantifications, some sources have wanted to include, in these "pseudo-duties", heterogeneous cost elements that are completely unrelated to the actual volume of commercial exchange, including regulations, excise duties, and administrative controls, therefore essentially bureaucratic costs and taxes of various kinds. It is the writer's opinion that this approach is misleading or at least does not justify the use of the phrase "internal duties", for which only frictional costs in trade (transport, distribution, and similar costs) should be included, which only in this case could be assimilated to "non-tariff barriers".

Having cleared the field of potential ambiguities, the problem remains of assessing the size of the phenomenon. Theoretically, it would be a matter of comparing the price at origin of a good or service produced in one EU country, including taxes and costs not related to the sale in a different country, with the final market price, as recorded in a different country of destination. That is to say, the *mark-up* generated by movement within the Union.

Unfortunately, there is no official data of this nature, and even information to help estimate these quantities is extremely scarce. From Eurostat's COMEXT database, exports [5]and imports from each EU country to the rest of the Union can be obtained for six categories of goods classified SITC, but without identification of the country of origin or destination. In addition, while exports are valued at FOB (Free on Board) prices, imports are valued at CIF (Cost, Insurance, and Freight) prices. Analyzing these data, although partial for our purposes, we have found several critical issues, which cast doubt on the quality and reliability of the information provided.[6]

Eurostat collects, systematizes, and makes more uniform the data collected by the statistical institutes of the various European countries, but the construction of an integrated system of European economic accounts is still a long way off. Efforts in this direction have been mostly limited

[4] For example, see the articles that appeared in "Milano Finanza" (21 July 2025, "The EU's invisible duties, what and how the internal barriers that hold back Italian companies work") and "Il Sole 24 Ore" (28 July 2025, "How much are the "internal duties" of the European Union worth? Here is what the IMF study cited by Meloni says").

[5] Standard International Trade Classification (https://oec.world/en/product-landing/sitc).

[6] Both flows are assessed at the border but, since there is no physical customs point, the distribution costs to/from the border are estimated, it is not clear with what methodology. Therefore, adjacent countries, such as France and Spain, should have a difference between CIF and FOB values close to zero, but this is not the case. Indeed, paradoxically, the total CIF flows are *lower* than the total FOB flows. This paradox is not new at international level, where the problem of underestimation of imports is well known, but it is surprising that this can emerge in the context of intra-European trade.

and experimental in nature, for example, with the FIGARO project[7], developed at the Joint Research Centre of the European Commission (Remond-Tiedrez and Rueda-Cantuche, 2019).

In this paper, we propose an alternative strategy, based on data from the GTAP (Global Trade Analysis Project) social accounting matrix[8]. This is an extensive database of the world economy, developed at Purdue University, which includes detailed data on production, consumption, international trade, input-output matrices, and trade barriers (tariffs and subsidies) for 160 countries and 65 manufacturing sectors around the world. The database has a multi-regional and multi-sectoral structure and is updated regularly every 2-3 years (Aguiar et al., 2022) with a specific base year (for the latest version available, version 11, is 2017).[9]

To estimate international trade flows, the GTAP consortium integrates several primary statistical sources, the most important of which is UN Comtrade, the United Nations database, which is the most comprehensive source of international trade statistics, with detailed data by product and trading partner. These data are integrated and harmonised with other sources, such as the WTO, UNCTAD TRAINS, national and international statistical bodies (including Eurostat).

The reason that pushes us to use this database is not so much to use a more complete and possibly reliable source of information, but that linked to the very nature of the database, given that it has been built with the primary objective of allowing the estimation of structural parameters within the general equilibrium model (*Computable General Equilibrium,* CGE), or rather of the CGE family of models developed by the GTAP consortium itself (Hertel and Tsigas, 1997).

In fact, there is a long tradition of applying numerical macroeconomic simulation models, of the CGE class, for the analysis of international trade policies. In this field, the GTAP model and database constitute a *de facto* standard. A classic example of application is that of international trade agreements (Hertel et al., 2007), and another that of regional free trade agreements (Burfisher et al., 2001), including the European Union (Baldwin, 1997). More recently, several contributions have analyzed the impacts of trade wars (Bekkers and Schroeter, 2020).

The main advantage in using these models is the possibility of identifying the systemic and structural effects that, starting from a change in relative prices, and therefore in competitiveness, allow for evaluating the consequences in terms of *trade creation* (or *destruction*), and *trade diversion*. In addition, the high degree of detail of the models allows to estimate other important macroeconomic variables, such as, for example, terms of trade, expanding and contracting sectors in each country, consumer welfare, employment, and others.

Therefore, in this work we propose, on the one hand, to quantify (to the best of the available information) the magnitude and relative incidence of the frictional costs of intra-European trade (attributable to transport and logistics costs), and on the other hand, to evaluate the role played by these within the structure of trade, and in the European economic system. This second objective is pursued by employing the same data and the same tools that are normally used for the simulation of international trade policies, thus insisting on the interpretation of transport margins as *sui generis duties*.

[7] The project aims to reconstruct complete multiregional input-output matrices (of the use-make type), between EU countries and towards some countries in the rest of the world. However, flows are calculated only as *agent price* values so, lacking market prices, it is not possible to derive the margins of our interest. In addition, from 2024–2025 Eurostat has withdrawn the FIGARO database from online publication, moving it to an area accessible only by direct request.

[8] https://www.gtap.agecon.purdue.edu/databases/default.asp

[9] Version 12 will be made available soon, with new reference years 2019 and 2023.

2. An estimate of transport margins between European Union countries

In this section, we present an estimate of trade flows per pair of countries in the European Union. As anticipated, this figure is not officially produced by any statistical agency; Eurostat limits itself to providing a quantification of national exports (measured in terms of FOB values, *Free On Board*) to the rest of the EU, as well as national imports from the rest of the EU (measured in terms of CIF, *Cost, Insurance and Freight values*).

EUROSTAT data are available until 2024, and for six categories (SITC Rev. 4) of physically transportable goods:[10]

- Food, Beverages & Tobacco
- Raw materials
- Mineral Fuels, Lubricants, and Related Products
- Chemicals & Related Products
- Other Manufactured Goods
- Machinery and transport equipment

In this study, we first aggregated the GTAP data, with a product classification compatible with Eurostat's SITC Rev.4, keeping the 27 countries of the European Union disaggregated. This has allowed us to obtain, for each category of transportable goods, two origin/destination matrices of trade flows, one of which has values that can be interpreted as recorded at the origin, and the other with values that can be interpreted as selling prices in the destination market. Therefore, a direct comparison between each pair of matrices allows you to derive the transport margins, expressed as a percentage of the original price (*mark-up*).

The structure of the six matrices at source prices was used as an a priori distribution in a maximum likelihood estimate, where the Eurostat data of 2024 are imposed as marginal constraints[11]. The result is six new 27x27 square matrices of trade flows, which then update the data from 2017 to 2024. On these matrices, using the transport margins obtained previously, it is possible to trace the corresponding origin/destination matrices at market prices.

Let us now briefly review some characteristics of the data we estimated. Figure 1 presents a map in which the colour attributed to each country has an intensity proportional to its share in the total intra-EU trade. Germany clearly dominates with a share of 21.6%, followed by the Netherlands (14.1%), Belgium (8.7%), France and Italy (both at 7.8%), and Spain (5.9%). These six countries together account for more than two-thirds of intra-European trade. The centrality of Germany, the Netherlands, and Belgium can be traced back to the presence of important logistics hubs (such as the ports of Rotterdam, Antwerp, and Hamburg) and a production structure strongly oriented towards foreign trade.

[10] https://ec.europa.eu/eurostat/databrowser/product/page/ext_lt_intratrd__custom_18739111

[11] More precisely, the totals of outflows were made to coincide with the FOB Eurostat export data, while the totals of inflows were aligned with the structure of the CIF import carrier, but with the values of the latter appropriately scaled to coincide with the FOB totals. Since Eurostat includes in the FOB values an estimate of transport costs up to the border, it is assumed that this correction can be considered negligible.

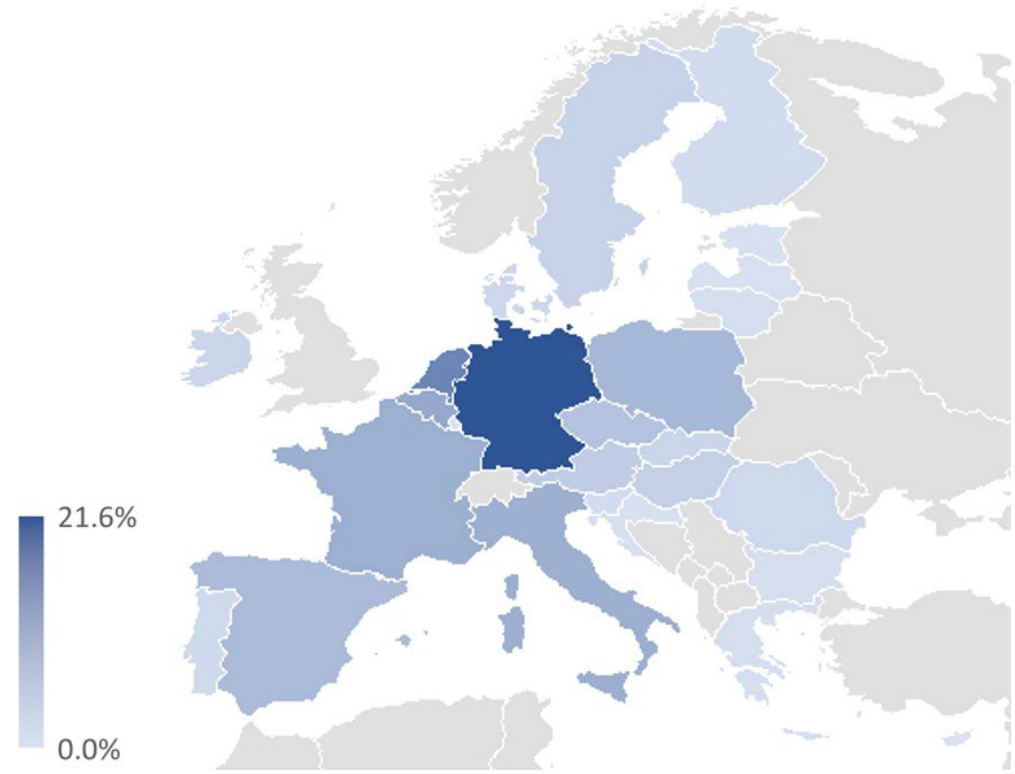

Figure 1 – Map of intra-European trade relevance.

Figure 2 presents a second map, in which the intensity of the color attributed to each country refers to its specific average distribution margin, calculated as the ratio of total distribution costs to total volume of trade, both inbound and outbound.

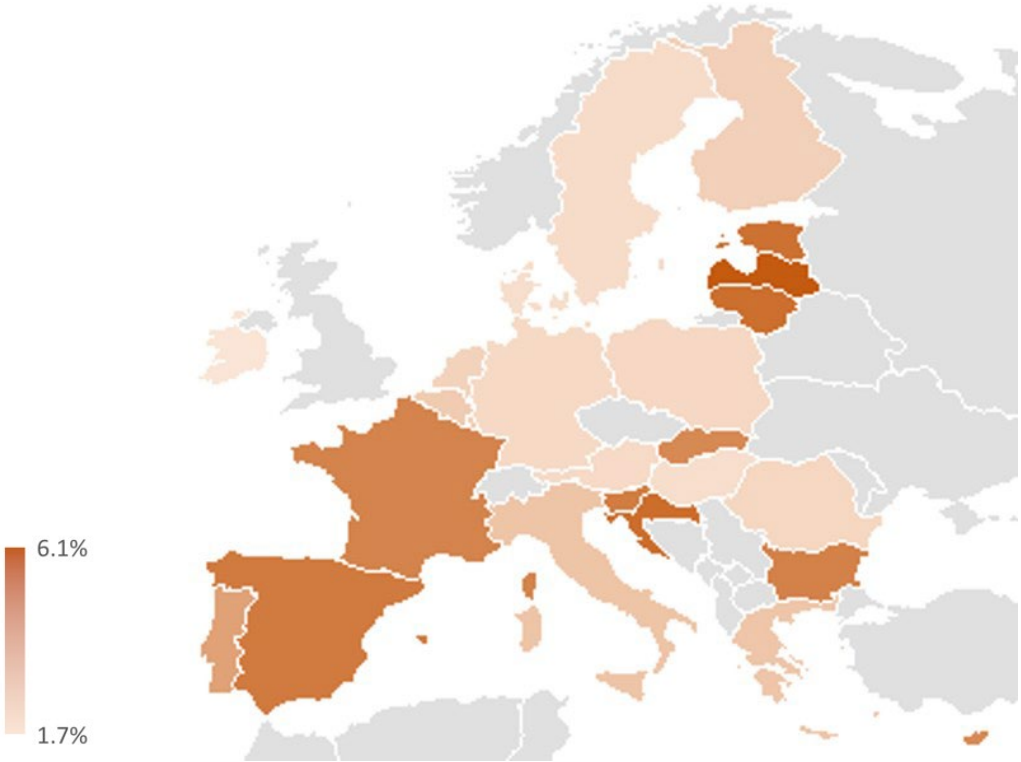

Figure 2 - Map of the average distribution margin.

There is considerable heterogeneity. The highest values of average margins are recorded in the Baltic countries and in some southern and eastern European economies: Latvia (6.1%), Lithuania

(5.5%), Estonia (5.3%), Croatia (5.5%), Spain (5.1%), and France (4.8%). These high margins indicate a greater relative incidence of transport and logistics costs on the value of exports, which can be traced back to multiple factors: distance from continental logistics nodes, specialization in the production of goods with a low value/weight ratio, presence of less integrated transport infrastructures in the main European corridors.

On the contrary, the countries of central and northern Europe have significantly lower average margins, generally between 1.7% and 2.5%. These include Ireland (1.7%), Denmark, the Czech Republic, Sweden, and Germany (all around 1.9–2.0%). These lower values may reflect the existence of more efficient logistics systems, proximity to destination markets, greater incidence of high value-added goods, such as machinery and complex products.

The reason why a higher or lower average margin is observed must be due to the more or less marked association of high margins with relatively low flows, given that high transport costs reduce competitiveness in the destination markets. A correlation index between these two elements, calculated at the level of the European Union, gives a result of -0.15. A weak negative correlation is in line with what might be expected, given that larger trade flows should be associated with lower transport and related costs, and vice versa. Of course, distribution margins are only one of the many determinants of trade, so this correlation, although generally correct in terms of sign, is weak.

The correlation index can also be calculated on a country-by-country basis. For Italy, for example, it is -0.18, therefore in line with the European average. Sometimes the index can explain why the average margin of a country is high, as in the case of France, where it is positive and equal to +0.18. In this country, significantly intense flows are associated with distribution costs of a certain magnitude.

Correlation is not always able to explain the existence of a medium-high margin, however. This is the situation in Spain, where average distribution costs are high, but the correlation index is -0.13. In fact, this does not derive so much from Spain's relationship with *all* the other EU nations, but specifically from trade with France, which borders to the north. Iberian exports (of physically transportable goods) to France (as the ultimate destination) represent as much as 24% of the total. French exports to Spain account for 14% of the corresponding total. The margins of distribution costs are high in both directions, and almost identical, with a high value of about 5.6%

With regard to the six product sectors considered in this study, Table 1 presents the amount of distribution costs, as well as the value of trade flows at the starting prices from the exporting country. The total cost of intra-European distribution amounts to more than 111 billion euros, against flows of about 4 trillion euros, with an average margin of 2.8%.

Table 1 – Distribution costs, trade flows, and related margins by sector.

Categorie merceologiche	Costi distributivi	Flussi	Margini
Cibo, bevande e tabacco	23,5	454,3	5,2%
Materie prime	9,1	135,9	6,7%
Combustibili	9,3	250,6	3,7%
Chimici	18,1	680,2	2,7%
Manifatturieri	31,2	1064,7	2,9%
Macchinari	20,1	1416,0	1,4%
TOTALE	***111,4***	***4001,8***	***2,8%***

The categories "Raw materials" and "Food, beverages and tobacco" have the highest shares of distribution costs compared to the value of exports, equal to 6.7% and 5.2%. This suggests that transportation and other distribution costs may have a greater impact in these cases than in industries where the ratio of weight, volume, and value of goods is relatively lower. For example, "Mineral fuels, lubricants and related products" have a lower average margin of 3.7%, while

"Chemicals and related products" have a value of 2.7%. The incidence of transport and logistics costs is even lower for the "Other manufactured goods" and "Transport machinery and tools" sectors, which together represent the largest part of trade flows. The first sector has an average margin of 2.9%, the second only 1.4%. Therefore, there is a predictable inverse relationship between the unit value of the goods and the incidence of distribution costs, given that goods of a higher value, compared to their weight, more easily absorb transport costs, which also depend on weight.

3. Macroeconomic effects of a reduction in transport margins: a general equilibrium analysis

To the extent that distribution, trade and transport margins between European countries can be interpreted as a sort of internal duties (or rather non-tariff barriers), we want to propose in this study a simulation exercise, carried out with the GTAP standard model (Corong et al., 2017), in which we simulate the impact of a hypothetical 50% reduction of all intra-European distribution margins, therefore treating them within the model just as if they were a particular type of duties.

Below, we present some of the most significant results from our simulation exercise. Table 2 shows the changes recorded in the total trade flows between macro-regions. The reduction in intra-European distribution margins would generate an appreciable increase of 3.6% in domestic flows, reducing at the same time both extra-EU imports (in particular from China, -0.68%) and extra-EU exports (in particular to the United States and the Rest of the World, -0.95% and -1.18%). As a second-order indirect effect, non-European countries would compensate for the lower volume of trade to and from Europe by trading more with each other.

Table 2 – Change in trade flows

	Europe	United States	China	Rest of the World
Europe	3,61%	-0,95%	-0,57%	-1,18%
United States	0,19%		1,19%	0,55%
China	-0,68%	1,09%		1,06%
Rest of the World	-0,45%	0,43%	1,08%	1,16%

As for the effects on individual European countries, these are summarized in Table 3, which has four columns. The first concerns the equivalent variation, i.e., a monetary measure of the impact on well-being, expressed in millions of dollars. The second records the change in overall national gross production. The third and fourth are changes in the volumes of exports and imports to or from other countries of the Union.

A clear effect emerges, particularly in the first two variables considered, linked both to the economic size of the country and to its degree of openness to trade with other countries of the European Union.

In terms of absolute differences, used in the calculation of EV, the influence of size is noted, with benefits for France quantifiable at more than 14 billion dollars, followed by Spain with more than 8 billion. It will be recalled that these two countries are characterized by a particularly high value of the average margin. Italy would get virtually just under 6 billion dollars, while for the entire European Union the benefit would be about 63 billion.

In the percentage change in production, on the other hand, it is the degree of openness (measurable, for example, as the ratio of imports or exports to GDP) that has the greatest influence. The country with the most significant impact is Lithuania (+0.62%), followed by Slovakia (+0.40%), Estonia (+0.35%), and Greece (+0.31%).

The impact on trade is more articulated. It can be seen that the variation recorded by many countries is much higher than the European average of 3.6%. For Spain, for example, there is an increase in exports to the EU of as much as 28.5%, while for Romania imports rise by as much as 34.07%. For many countries, including Italy, gains in inflows and outflows are similar in order of magnitude, but other countries (Spain, Romania, Finland, Estonia, Cyprus, Croatia, and Bulgaria) are highly asymmetric. The latter characteristic must be traced back to a different composition in the structure of imports and exports, which in both cases include services. For the latter, distribution margins are considered negligible.

Table 3 – Equivalent change (EV) and change in gross production, exports, and imports to/from the EU, by country

Country	***EV***	***Product***	***Exp. EU***	***Imp. EU***
Austria	1473	0,14%	8,11%	8,98%
Belgium	5302	0,27%	5,84%	3,87%
Bulgaria	986	0,24%	0,00%	4,89%
Croatia	952	0,08%	5,47%	0,00%
Cyprus	-26	0,11%	7,69%	0,00%
Rep.Ceca	1293	0,10%	6,87%	9,26%
Denmark	-202	0,25%	10,88%	9,42%
Estonia	623	0,35%	1,52%	6,16%
Finland	751	0,05%	10,49%	5,11%
France	14128	0,02%	4,68%	2,18%
Germany	8248	0,04%	7,51%	6,16%
Greece	7	0,31%	17,09%	17,22%
Hungary	880	0,14%	5,45%	8,68%
Ireland	295	0,01%	4,75%	2,57%
Italy	5964	0,01%	8,60%	10,06%
Latvia	717	0,04%	1,94%	2,58%
Lithuania	831	0,62%	7,00%	10,60%
Luxembourg	126	0,12%	3,25%	0,00%
Malta	147	0,05%	2,25%	1,63%
Netherlands	2648	0,17%	6,65%	6,33%
Poland	2201	0,11%	9,56%	10,89%
Portugal	1676	0,06%	8,99%	7,35%
Romania	695	0,03%	12,67%	34,07%
Slovakia	2256	0,40%	2,98%	2,78%
Slovenia	1338	0,20%	-0,19%	0,99%
Spain	8291	0,00%	28,50%	4,31%
Sweden	1239	0,04%	7,93%	6,21%

4. Concluding remarks

What should we include in the concept of European 'internal tariffs'? How high are these barriers to the free movement of goods? How much do they affect the structure of exchanges? What macroeconomic impacts would be recorded if they were to be significantly reduced? In this work we have tried to give an answer, which we admit is somewhat limited, to these questions.

The main obstacle we have encountered is the lack of information, and it is surprising that, having removed the formal barriers to the movement of goods (and people, services, and capital), due attention has not been paid to the remaining substantial barriers, including those related to transport and logistics.

These barriers are not only of a physical nature, as they are linked to distance and geographical conformation. Distribution services and costs also arise because of a specific market structure, in which imperfections of various kinds, oligopolies and natural monopolies, incomplete networks and bottlenecks persist. Therefore, there is room for manoeuvre for an effective European policy, which however cannot be separated from knowledge of the data.

Our numerical simulation exercise revealed that a hypothetical reduction to half of all transport and logistics costs, affecting the trade of physical goods between countries of the European Union, would be able to generate aggregate benefits quantifiable at 63 billion dollars per year. It would also stimulate intra-European trade, while at the same time reducing imports from China, as well as exports to the United States and the rest of the world. The impacts would have a differential impact between countries and sectors, benefiting relatively small and open economies, but in absolute terms also larger economies, in particular France, Germany, and Spain.

Bibliographical references

Aguiar, A., Chepeliev, M., Corong, E., & Van Der Mensbrugghe, D. (2022). The Global Trade Analysis Project (GTAP) database: Version 11. *Journal of Global Economic Analysis*, *7*(2).

Baldwin, R. E., Francois, J. F., & Portes, R. (1997). The costs and benefits of eastern enlargement: the impact on the EU and central Europe. *Economic policy*, *12*(24), 125-176.

Bekkers, E., & Schroeter, S. (2020). *An economic analysis of the US-China trade conflict* (No. ERSD-2020-04). WTO Staff Working Paper.

Burfisher, M. E., Robinson, S., & Thierfelder, K. (2001). The impact of NAFTA on the United States. *Journal of Economic Perspectives*, *15*(1), 125-144.

Corong, E. L., Hertel, T. W., McDougall, R., Tsigas, M. E., & Van Der Mensbrugghe, D. (2017). The standard GTAP model, version 7. *Journal of Global Economic Analysis*, *2*(1), 1-119.

Hertel, T., Hummels, D., Ivanic, M., & Keeney, R. (2007). How confident can we be of CGE-based assessments of Free Trade Agreements?. *Economic Modelling*, *24*(4), 611-635.

Hertel, T. W., & Tsigas, M. E. (1997). Structure of GTAP. Global Trade Analysis: modeling and applications, 13-73.

Remond-Tiedrez, I., & Rueda-Cantuche, J. M. (Eds.). (2019). *EU inter-country supply, use and input-output tables: Full international and global accounts for research in input-output analysis (FIGARO)*. Luxembourg: Publications Office of the European Union.