On Current Account Discrepancies, Tariff Retaliation, and the Political Economy of Free Trade

Inaugural-Dissertation
zur Erlangung des Grades Doctor oeconomiae publicae
(Dr. oec. publ.)
an der Ludwig-Maximilians-Universität München

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Koreferent: Prof. Dr. Clemens Fuest
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"And this I believe: that the free, exploring mind of the individual human is the most valuable thing in the world. And this I would fight for: the freedom of the mind to take any direction it wishes, undirected. And this I must fight against: any idea, religion, or government which limits or destroys the individual human. This is what I am and what I am about."

John Steinbeck, East of Eden

Danksagung

Der Moment des Abschließens dieser Arbeit erfüllt mich nicht nur mit Stolz, sondern vor allem auch mit aufrichtiger Dankbarkeit gegenüber den vielen wohlmeinenden Weggefährten und Unterstützern, die dies erst ermöglichten. Unter der Obhut meines Doktorvaters Gabriel Felbermayr, der mich während der Phase des geistigen Flügge-werdens wie kein anderer und im besten Sinne prägte, durfte ich meine ersten akademischen Gehversuche unternehmen. Gabriel war dabei für mich immer Inspiration und Ansporn, aber auch Halt und Hilfe, auf dessen Loyalität ich stets uneingeschränkt bauen konnte. Nicht zuletzt bin ich ihm freundschaftlich verbunden und auf ewig dankbar für die vielen Stunden an wertvollen Diskussionen, während derer sich so vieles plötzlich zu erschließen begann. Clemens Fuest inspirierte mich während der vergangenen Jahre nicht bloß durch eine Vielzahl an klugen Gedanken, mit denen er mein Nachdenken anregte, sondern ist insbesondere durch seine bedachte und besonnene Art zu einem Vorbild geworden. Meinem Zweitgutachter danke ich aber auch für das uneingeschränkte Vertrauen, das er mir entgegenbrachte, indem er ich mich im Namen des ifo Instituts an den öffentlich geführten wirtschaftspolitischen Debatten teilnehmen ließ. Meine gesamte Zeit am ifo Institut über genoss ich völlige wissenschaftliche Freiheit, erfuhr stets höchste Wertschätzung und durfte mich wirklich sinnstiftender Arbeit hingeben. Für all das bin ich sehr dankbar. Eng damit verbunden möchte ich Christiane Harms für ihre geradezu fürsorgliche Unterstützung während der vergangenen vier Jahre meinen Dank aussprechen. Auf Kyle Bagwells Einladung hin durfte ich ein halbes Jahr an der Stanford University verbringen. Während dieser Zeit entstanden die Forschungsidee für und wesentliche Teile des vierten Kapitels dieser Arbeit. Ich danke Kyle besonders für seine tiefen Gedankengänge, die er oft mit mir teilte und so zum Gelingen dieser Arbeit nicht unerheblich beitrug. Nicht weniger verdanke ich Kollegen und Ehemaligen am ifo Institut, die meine ersten wissenschaftlichen Unternehmungen nicht bloß begleiteten, sondern notfalls auch helfend eingriffen und mich vor so manchem Fehltritt bewahrten. Ich danke aus diesem Kreise insbesondere Andrea Ariu, Michele Battisti, Jasmin Gröschl, Alexander Sandkamp, Thomas Steinwachs und Erdal Yalcin. Besonders danke ich Marina Steininger, vor allem für ihre Geduld und Nachsicht während der zwei Jahre im gemeinsamen Büro, sowie Feodora Teti, die gerade in den letzten Monaten vor Fertigstellung dieser Arbeit quasi zu einer Doktor-Stiefmutter avancierte und mich beständig zum Weiterarbeiten antrieb. Das messerscharfe Denken meiner Ökonomen-Freunde Martin Mosler und David Streich forderte mich in unzähligen Diskussionen während der letzten Jahre stets heraus, sodass ihr Einfluss auf mein akademisches Wirken nicht unerwähnt bleiben soll und ebenfalls größte Dankbarkeit verdient. Zuletzt, aber nicht minder bedeutsam, möchte ich meinen Eltern und Geschwistern danksagen für die bedingungslose Unterstützung in all meinem Tun und zeit meines Lebens.

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Preface

Excerpts of the EU's Trade Policy between 2016–2020

The four chapters of this dissertation address several milestones of the European Union's (EU) trade policy between 2016 and 2020. During that period, a remarkable shift in the trade policy agenda occurred: while in 2016, the EU and the United States (U.S.) were still negotiating over the establishment of the world's largest free trade zone, they began levying tariffs and counter-tariffs on each other only two years later. After the election of Donald Trump for U.S. President, increasing trade tensions de facto terminated the so-called "Transatlantic Trade and Investment Partnership" (TTIP), an ambitious but highly controversial free trade agreement. While the initial objective was *to maximize welfare* across the Atlantic Ocean, the EU was later forced into actions that predominantly aimed at *minimizing damage*.

As a consequence of the scrutiny of the EU–U.S. trade relations, it should turn out that the actual economic relationship between the EU and the U.S. is less certain than expected: for the past 10 years, it has not been clear whether the EU or the U.S. has run a bilateral current account surplus. These statistical discrepancies in balance of payments (BoP) data are at the core of Chapter 1.[1] In the course of the subsequent debate on the reliability of such statistics, the research question for Chapter 2 evolved.[2] It is centered around the logically impossible fact that the EU—according to data provided by Eurostat—runs an annual trade surplus with itself that amounts to 307 bn EUR, or nearly 2 percent of the Union's GDP. Value added tax fraud in cross-border transactions could be one explanation. Chapter 3 examines political economy aspects of free trade and analyzes public sentiments across EU Member States towards policies promoting open markets

[1] Please note that this Chapter has been written in co-authorship with Gabriel J. Felbermayr. It is published in the *CESifo Economic Studies* (Braml and Felbermayr, 2019).

[2] Please note that this Chapter has been written in co-authorship with Gabriel J. Felbermayr. It is published as *CESifo Working Paper No. 7982*.

and globalization.[3] It discusses the sensitivity of modern trade policy and concludes that declining approval ratings for free trade actually and particularly reflects a broader crisis of trust in institutions. The final chapter of this dissertation evaluates several rounds of retaliatory tariffs between the EU and the U.S. More precisely, it addresses the question on which basis these tariffs are set. What determines the selection of products for tariff retaliation? Are these *beggar-thy-neighbor* or rather *favor-thy-industry*-type tariffs?

Chapter 1 discusses the bilateral balance of payments positions between the EU and the U.S. against the background of growing transatlantic trade tensions in the first half of 2018. Most economists would agree that bilateral trade balances alone are ill-suited for the purpose of welfare analyses or similar objectives. Notwithstanding frequently stated mercantilistic ideas, Chapter 1 argues that bilateral trade balances indeed matter for certain purposes. In the event of trade wars, bilateral balances become important: a bilateral current account surplus implies that the foreign country can levy tariffs, non-tariff trade restrictions, or measures related to foreign income at a larger scale than the home country. Acknowledging that means of retaliation are limited by the amount of imports, bargaining power in trade wars shrinks with the bilateral net surplus. The recent ceasefire in the Sino–American trade spat perfectly reflects this pattern as it in fact resembles a kowtow of the Chinese government to the U.S. administration: in order to prevent additional tariffs, it has committed, amongst others, to reduce the bilateral surplus by purchases of U.S. goods and services amounting to 200 bn USD over two years.[4] This bargaining outcome equates the distribution of initial negotiation power implied by the bilateral current account balance.

For the EU, the initial situation with respect to the U.S. was different: since 2009, official sources disagree on the sign of the current account balance. The U.S. Department of Commerce claims a consistent U.S. surplus while Eurostat reports the opposite. International transactions are notoriously difficult to measure accurately, but the mere size of the transatlantic discrepancy is stunning: over the past ten years, the discrepancy has grown to a cumulated 1 tr USD. In times of severe trade policy disagreements across the Atlantic, this gap is evidently problematic. Chapter 1 dissects the transatlantic reporting gap. Two country-pairs, the U.S. trade with the UK and the Netherlands, account for almost the entire transatlantic discrepancy, which, in 2017, stood at about 187 bn USD. In the former case, national statistics on net services trade disagree by as much as 55 bn USD per year. In the latter case, there is a reporting difference in net primary income

[3] Please note that this Chapter has been written in co-authorship with Gabriel J. Felbermayr.

[4] Cf. "Economic and Trade Agreement between the Government of the United States of America and the Government of the People's Republic of China", *click here*, accessed on March 10, 2020.

of about 60 bn USD, which may likely result from corporate tax evasion. By contrast, data provided by the Bundesbank for the German–U.S. current account closely mirror U.S. data. Non-random measurement error and, possibly, deliberate manipulation seem to cause the observed discrepancies. This Chapter was published as a research paper and contributed to the political debate quite substantially. It was the first that made policy makers and researchers aware of the uncertainty about the transatlantic current account balance.

Chapter 2 draws on and extends the findings from Chapter 1. Examining intra-EU BoP data brought to light the statistical artifact that the EU runs a trade surplus with itself. This self-surplus blatantly fails to satisfy accounting principles. It is a well-known fact in international economics that the world as a whole runs a trade surplus with itself: the reported values of exports exceed the reported values of imports. It is less well-known that, in recent years, more than 80 percent of the global surplus is accounted for by the EU's self-surplus. Chapter 2 stresses the point that this EU self-surplus amounts to a striking 307 bn EUR in 2018. It persists in goods, services, and secondary income accounts. It also exists within the Euro Area, and is strongest between neighboring countries. Around the 2004 Eastern Enlargement, the EU self-surplus quadrupled. Balance of payments data from the United Kingdom appear highly distorted, a pattern that is already discussed in Chapter 1.

To the best of my knowledge, highlighting the EU's self-surplus is absolutely novel and thus makes a core contribution to the existing literature on "missing trade". Published as a working paper, this Chapter received considerable attention by the media.[5] Apart from a descriptive analysis, this Chapter applies forensic accounting methods. Thereby, it raises the "cui bono" ("who benefits?") question in order to provide plausible hypotheses as to how these severe distortions in intra-EU trade figures could evolve. It argues that this phenomenon is not only due to measurement error. Rather, a large fraction of the EU's self-surplus puzzle seems related to fraud in value added tax. The resulting loss in tax income could amount to as much as 64 bn EUR per year. Moreover, as a policy implication, Chapter 2 outlines a concept for an EU-wide electronic clearing procedure that is based on two-factor authentication for cross-border transactions and automatic data transmission. The mechanism is designed such that the quality of data recording would improve and potential tax fraud could be curbed.

[5] Nationally, among others, BILD, Die ZEIT, FAZ, Handelsblatt, Spiegel Online, n-tv have reported the findings of this research paper. Internationally, among others, The Financial Times, Bloomberg, and the NZZ covered this topic.

Chapter 3 addresses the topic of globalization in general and transatlantic trade in particular from a different angle: its political economy facet. Mass demonstrations against the TTIP across EU Member States revealed public concerns with respect to free trade already prior to President Trump's disruptive foreign trade policy. Attitudes towards free trade—as the TTIP example shows—are an important determinant for the democratic legitimacy of free trade agreements. Thus, this Chapter aims at understanding free trade and globalization attitudes more systematically and more comprehensively. For this purpose, it builds on theoretical frameworks such as the "Globalization Trilemma" (Rodrik, 1998) or the "New World of Trade" (Lamy, 2015) and tests them empirically. Moreover, it emphasizes a link between public opinions and regional experiences with trade liberalization in the past. Thereby, it is inspired by the influential contribution of Autor et al. (2013).

Chapter 3 shows that individual preferences for open-market policies are mainly shaped by trust in institutions and not by economic self-interest. On the basis of the Eurobarometer, a comprehensive semi-annual survey that monitors public opinion in EU Member States, it exploits data on attitudes towards the TTIP, free trade, protectionism, and globalization. It finds that preferences for policies promoting open markets cannot be sufficiently explained by variables that, according to classical trade theory, typically determine personal advantages. Nevertheless, rational considerations follow expected patterns, in particular when individuals express strong preferences. A spatial analysis at the European NUTS-2 level shows that measures of regional trade exposure and other macroeconomic determinants serve as well-suited predictors for the substantial cross-regional variation in the support for globalization. Country specific narratives are predominant drivers of individual open-market attitudes.

Chapter 4 shares with Chapter 1 a distinct focus on EU–U.S. trade relations. As mentioned, since 2018, the U.S. and the EU have been erecting trade barriers against each other. From a legal perspective, newly imposed tariffs came as countervailing duties (U.S. tariffs because of unlawful subsidies for Airbus), compensating measures (EU tariffs implemented in response to U.S. steel and aluminum tariffs), or as threats to deter the opposing side from taking certain actions (announced U.S. tariffs against France because of its proposal for a Digital Services Tax). Some of these tariff rounds are embedded in the context of dispute settlement by the World Trade Organization (WTO), others are not. From an economic point of view, all of these retaliatory tariffs have one common feature: governments can freely choose among the universe of imported product lines on which to levy tariffs. In contrast to the Sino–American trade dispute, a fairly small amount of transatlantic trade is affected by new tariffs: roughly 2 percent of the total

trade volume is treated, another 3 percent is under consideration. Chapter 4 sheds light on what underlies the EU's and the U.S.' decisions when selecting products for tariff retaliation.

This Chapter takes stock of transatlantic retaliatory tariffs currently in place and under consideration. It provides a brief history of EU–U.S. trade disputes after the foundation of the WTO, and introduces the concepts and effects of trade policy including retaliation under the General Agreement on Tariffs and Trade (GATT). Chapter 4 outlines three distinct motives that can explain how products might qualify for tariff retaliation: shifting the tariff incidence abroad according to optimal tariff theory, concentrating losses abroad in politically sensitive regions or industries, and rent-seeking by domestic lobbyists. The first two can be summarized as *beggar-thy-neighbor*-type tariff setting, while the latter can be labeled as *favor-thy-industry* approach. There is evidence that the U.S. in particular sets tariffs according to optimal tariff theory. For the EU, some evidence points in the direction that tariff revenue maximization could motivate the selection of products. Political motives, however, seem to play a more important role as the targeting of the French wine industry by the U.S. exemplifies. Moreover, this Chapter performs an ex-post impact evaluation of EU tariffs in response to U.S. steel and aluminum tariffs: within one year, imports of products treated with a 25 percent ad-valorem tariff fell by 36 percent. Trade diversion could only partially offset this decline in imports. Finally, this Chapter proposes a concept for a transparent protocol which could be applied for the selection of products for retaliation purposes. This analysis is the first that structurally examines the selection of retaliatory tariffs; its conceptual framework could easily be applied to contexts beyond transatlantic trade in the Trump era.

Chapter 1

On the EU–U.S. Current Account

"When a country (USA) is losing many billions of dollars on trade with virtually every country it does business with, trade wars are good, and easy to win. Example, when we are down $100 billion with a certain country and they get cute, don't trade anymore—we win big. It's easy!"

U.S. President Donald Trump on Twitter (March 2, 2018)

"Economists have long recognized that the bilateral trade deficit is a misleading indicator [...]. However, the objections of the profession have not stopped the bilateral trade deficit becoming one of the key variables in U.S. trade disputes [...]. Because the bilateral trade deficit has real consequences on trade policies, we should definitely solve the technical problem of measuring it accurately."

Feenstra et al. (1999)

"In assessing external balances, we note the importance of monitoring all components of the current account, including services trade and income balances."

G20 Osaka Leaders' Declaration (June 29, 2019)

1.1 Background and Related Literature

U.S. President Trump has made trade politics a key issue of his political agenda. He seems convinced, like many other politicians in the U.S. and elsewhere before him, that the vastly negative U.S. trade balance were evidence for the U.S. being taken advantage of by its trade partners. And he attempts to solve this "problem" by focusing on bilateral trade relations. Next to the U.S.–China relationship, the transatlantic link appears high up on the agenda of the President.

In this chapter, we highlight very substantial discrepancies in the transatlantic current account. We contribute by *(i)* describing the dynamics of the bilateral position from the EU and U.S. perspective, *(ii)* dismantling the current account into its sub-accounts and their contribution to the overall discrepancy, *(iii)* decomposing the discrepancy into EU member state contributions, and *(iv)* providing tentative interpretations of our findings.

We argue that for all practical purposes, if one considers bilateral balances, a broad view on the current account is more adequate than a narrow one on goods trade. Borders between goods and services trade and primary income are becoming increasingly blurred. One reason is the increasing servitication of manufacturing (Lodefalk, 2013), another is the fact that whether an intangible service transaction appears in the primary income accounts or in the services accounts often depends only on tax treatment.

Economists, as the above quoted Feenstra et al. (1999) dismiss a trade policy strategy targeting bilateral positions as misguided, at least from a welfare theoretic point of view. Of course, aggregate imbalances do matter, but they are mostly driven by the stance of fiscal and monetary policy. Moreover, bilateral balances are largely non-informative from a macroeconomic or welfare theoretic perspective; see Mankiw (2018) for an illustrative example: clearly, countries can run large bilateral trade surpluses or deficits despite their aggregate positions being in balance.

However, bilateral balances do matter politically. First, a country with a large deficit (the U.S.) or surplus (Germany[1]) may want to take measures to address this imbalance, and this may well require a breakdown of the overall balance into bilateral components to guide policy. Second, bilateral balances are strong predictors for the relative costs of trade wars between two countries. As a consequence, the deficit country tends to have a stronger bargaining position than the surplus country. Therefore, it is irritating that official statistics fail to provide a consistent answer on the sign and size of the U.S.–EU current account balance.

[1] For an analysis of the German current account, cf. Bonatti and Fracasso (2013).

There is relatively little academic research on bilateral positions. One rare example is Davis and Weinstein (2002) who argue that bilateral imbalances are either the result of aggregate imbalances or they may result from triangular trade, by which structures of comparative advantage and preference lead one country to export to one partner but not to the other, with importing patterns taking opposite shapes. They argue that the standard gravity models fail to convincingly predict any significant bilateral net trade positions; hence they talk about a "mystery of the excess trade (balances)". Felbermayr and Yotov (2019) show that properly accounting for multilateral trade restrictiveness indices can solve the mystery.

We argue that patent boxes as well as other tax avoidance schemes make it profitable for multinational enterprises to shift intangible assets into low tax countries. This converts service exports, e.g., license fees and royalties, into primary income. Due to its R&D intense and export-oriented services sectors, this is particularly important in the case of the United States. Thereby, dividends on FDI and other corporate income become perfectly substitutes to exports and must be interpreted accordingly. Consequently, bilateral current account imbalances, rather than imbalances of goods trade, are best suited for highlighting the distribution of bargaining power in trade wars. This is why our analysis focuses on bilateral BoP statistics between the U.S. and the EU.

The fact that international mirror data often do not match has been long known. For example, the world's current account with itself is notoriously unbalanced. Frankel (1978) already addresses potential channels why the world tends to run a current account deficit in the 60's and 70's. This debit-bias, however, has changed over time into a credit-bias in the early 2000s. Gros (2017) reports a recent current account surplus amounting to 300 bn USD per year.[2] As a potential reason for this credit-bias, Helbling and Terrones (2009) argue that time lags in international transportation might lead to lagged recording of imports relative to exports; in a world of rapidly growing trade, global surpluses are then a necessary consequence. Of course, interstellar trade could explain a global surplus, a conjecture taken up by Krugman (2010) in a very humorous contribution drawing on Einstein's Relativity Theory.

There is also some work on bilateral balances. Ferrantino et al. (2012) investigate the discrepancies in goods trade between the U.S. and China and link them to VAT fraud and tariff evasion. However, as we discuss in Section 1.2, goods trade statistics are not the predominant driver of the large transatlantic discrepancies. They are rather driven by services and primary income accounts. Cezar and Le Gallo (2019) outline that

[2] Interestingly and surprisingly, he shows that the global current account imbalance is strongly correlated with the German current account balance.

transatlantic bilateral discrepancies with respect to primary income can be traced to differences in accounting methods.

Economists have urged politicians and statistical offices to invest in more international cooperation with the objective to improve data accuracy and consistency. For example, twenty years ago, Feenstra et al. (1999) urged for better international transaction data. Since then, progress made in certain areas has been frustrated by new technical problems triggered by technological and legislative change. Moreover, with the globalization process, data gaps have actually grown, both in relative and in absolute terms. There are international conventions regulating the accounting practices (the Balance of Payments and International Investment Position Manual 6 (BPM6) standard), but the rules leave scope for interpretation, and there is little supervision or enforcement of rules. This is increasingly problematic: in times of trade conflict, the enormous discrepancy between the U.S. and the EU data has "real consequences on trade policies".

The chapter is structured as follows: Section 1.2 documents recent events in the transatlantic trade spat and provides an aggregate picture of the EU and Euro Area current account vis-à-vis the US. Section 1.3 narrows down bilateral BoP positions at the member state level to identify contributors to the overall discrepancy. In Section 1.4, we discuss tentative results on the reasons for this multi-billion dollar gap. Finally, Section 1.5 concludes and gives some policy advices.

1.2 Transatlantic Differences on Trade and on Trade Data

This Section is structured in a way that it first provides more background on the recent transatlantic trade dispute. Thereafter, it shifts the focus to the aggregate current account discrepancies between the U.S. and the EU, which serve as starting point for the subsequent analysis.

1.2.1 The Up and Down of Transatlantic Trade Policy Tensions.

During his presidential campaign in 2016, Donald Trump made very clear that he sees as his duty to reduce the large U.S. deficit in goods trade with many countries and that tariffs would be the instrument of his choice. Next to China, his rhetoric targeted Europe, in particular Germany. Due to these statements, it became clear, that the negotiations for a Transatlantic Trade and Investment Partnership (TTIP), that the EU and the U.S. had

been engaged in since 2013, would be discontinued. Since Donald Trump's inauguration as President of the United States, those negotiations have been in the freezer.

It took until March 8, 2018 for the U.S. president to sign into existence the first wave of tariffs, on steel and aluminum products, invoking Section 232 of the Trade Expansion Act of 1962, and arguing that imports of such goods caused severe national security concerns. The EU initially was exempted and tried frantically to avoid being hit. But from June 1st 2018 onwards, the U.S. has been applying tariffs of 25 percent and 10 percent on imports of European steel and aluminum products, respectively. The EU retaliated with tariffs on U.S. steel and aluminum products and on iconic American products such as Bourbon Whiskey, jeans, peanut butter or Harley-Davidson motorcycles.

This prompted the U.S. President to twitter "Based on the Tariffs and Trade Barriers long placed on the U.S. & its great companies and workers by the European Union, if these Tariffs and Barriers are not soon broken down and removed, we will be placing a 20% Tariff on all of their cars coming into the U.S. Build them here!" (June 18, 2018). Earlier, he had already commissioned a new Section 232 investigation into possible security concerns related to imports of cars. The EU made clear that it would retaliate much as it had retaliated on the first wave of tariffs.

At some surprise, during a meeting at the White House in Washington on July 26, Donald Trump and the President of the EU Commission Jean-Claude Juncker agreed to a moratorium on further tariffs. They announced the intention to close a free trade agreement in the near future that will include, amongst other things, full elimination of all industrial tariffs.[3] Being asked for the reason of the breakthrough, Mr. Juncker replied to a leading German broadcaster:[4]

"I have tried several times to explain: if one sums up goods trade, services trade, and profits of multinational firms, the U.S. runs a surplus and we actually have a deficit. Trump has denied these figures until I could demonstrate that they originate from American statistics; after that, the conversation was much friendlier".

Even before the so called "Rose Garden Truce", on June 12, 2018, German Chancellor Angela Merkel rejected US critics on bilateral economic relations, referring to the US surplus once services are taken into account.[5]

Possibly, the President of the EU Commission had made use of an analysis by Felbermayr (2018) (from May 2018) which pointed out that the U.S. President's focus on goods trade

[3] EU Commission Press Release, accessed on November 20, 2018.

[4] ARD Tagesschau, accessed on November 19, 2018. Author's translation.

[5] Spiegel Online, accessed on November 19, 2018. Author's translation.

neglects the fact that the U.S. runs a current account surplus vis-à-vis the European Union—despite a deficit in goods trade amounting to 153 bn USD in 2017. This deficit is offset by surpluses in service trade (51 bn USD), primary income (106 bn USD), as well as secondary income (10 bn USD). On May 30, 2018, an earlier version of this chapter qualified this statement on the U.S. current account surplus with the EU (Felbermayr and Braml, 2018); official U.S. statistics provided by the Bureau of Economic Analysis prove a U.S. surplus of 14 bn USD.

Strikingly, however, according to EU statistics compiled by Eurostat, the statements by both President Juncker and Chancellor Merkel would be wrong as those data suggest the EU ran a current account surplus vis-à-vis the US amounting to 170 bn EUR (192 bn USD) in 2017. The corresponding statistical discrepancy accounts for 206 bn USD, nearly the size of the Portuguese economy. Revised EU statistics published on November 2018 reduced the suspected EU surplus to 154 bn EUR (174 bn USD).

Clearly, the fact that U.S. statistics, and not European sources, indicate a bilateral surplus for the U.S. has greatly supported the EU's stance on the trade dispute. However, these very large discrepancies in bilateral current account figures bring up the important question about the true state of the transatlantic bilateral balance. Obviously, both sources—the U.S. BEA and Eurostat—cannot be simultaneously right.

1.2.2 The EU–U.S. Current Account

We start by presenting key facts on the transatlantic bilateral current account as reported by the US Bureau of Economic Analysis (BEA), an organizational unit of the U.S. Department of Commerce, as well as from Eurostat, the EU's statistical unit which collects data from member states. As the BEA data is the most comprehensive data collection, it serves as reference point for our analysis. It contains bilateral accounts for many U.S. trade partners, providing information on trade in goods, trade in services, primary income (compensation of foreign factors of production) and secondary income (transfers of goods, services, income, or financial items without a quid pro quo).[6] Our analysis is constrained by data availability and encompasses bilateral current account figures vis-à-vis the U.S. for a few EU member states only. For easy comparability, we look at all data from the perspective of the US and report all figures in US dollars.[7]

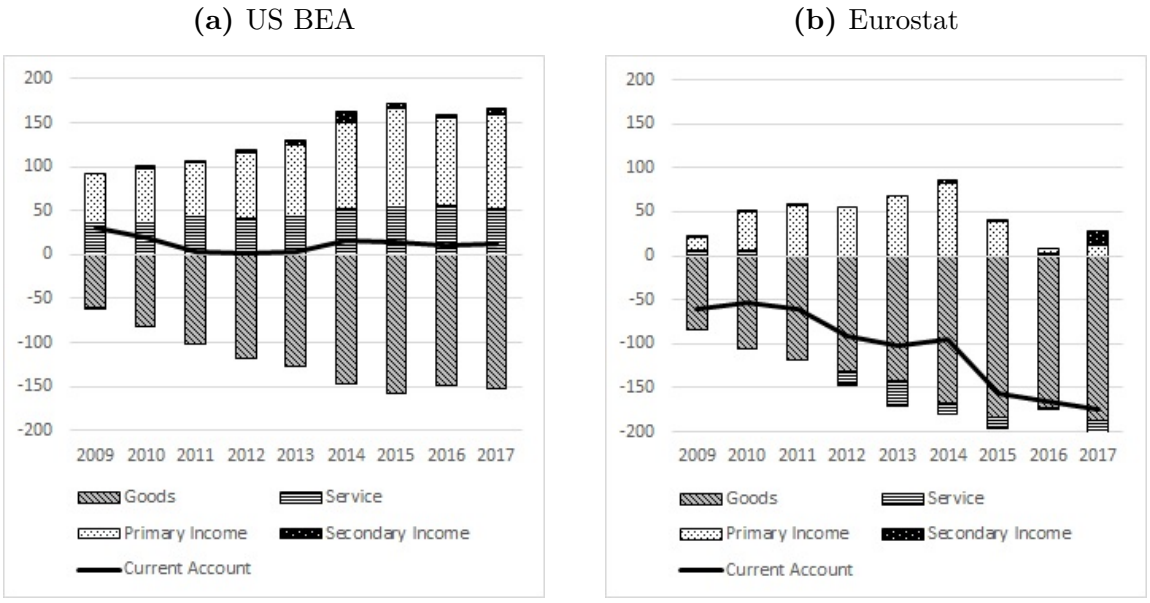
[6] We do not discuss secondary income accounts given their low economic relevance.

[7] Balances data from European sources are translated from Euros into US dollars using the FRED data base. The time horizons under investigations differ due to data availability; we always have included as many observations as possible.

Figure 1.1 illustrates the core of the problem.[8] It compares BEA data (left part) with their mirror images from Eurostat (right part). The messages told by these two figures could not be more contradicting: according to the BEA, the U.S. has run a current account surplus vis-à-vis the EU in every year since 2009, while according to Eurostat the opposite was true. Looking at sub-balances, for 6 years out of 9 in the period 2009-2017, the sign of the services balance has been inconsistent. According to the BEA, the U.S. net primary income balance has exceeded the number reported by Eurostat tenfold. The only account exhibiting a consistent pattern is the one that refers to goods trade. Even if absolute numbers reported by the EU are slightly higher, the time series are very highly correlated ($Corr = 0.98$).

According to the BEA, the cumulative U.S. surplus over this period amounts to 113 bn USD; the cumulative U.S. deficit according to Eurostat yields 957 bn USD.[9] In less than a decade, more than one trillion dollars—the same value as the world's most valuable firms—has gone lost in the transatlantic current account statistics.

Figure 1.1: The EU–U.S. Current Account: U.S. vs. EU Sources, bn USD



Source: BEA, 2018. Eurostat, 2018. Own illustration.

Note: Figures show balances; balances of Subfigure (b) are multiplied by minus 1 to reflect the "U.S. perspective".

[8] Differences to our previous findings in Felbermayr and Braml (2018) are due to the revision of Eurostat balance of payments data, which was published on November 19, 2018. To the best of our knowledge, we were the first to highlight the massive discrepancies in current account data between the United States and the European Union.

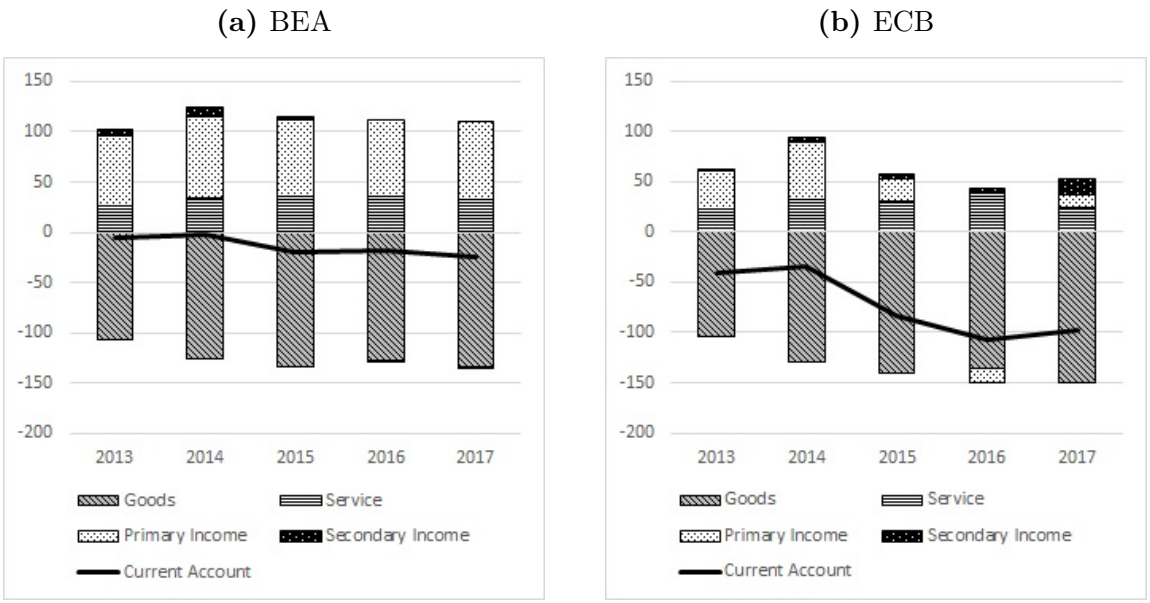
[9] Current Prices.

1.2.3 The Eurozone–U.S. Current Account

When we began our work, European current account data for the Euro Area vis-à-vis the U.S. was not available. A sub-account of the primary income account ("Primary Income, Investment Income, Portfolio Investment, Debit") was missing. The U.S. mirror account amounted to 83 bn USD in 2017, a non-negligible number.[10] Thus, we had no information on the Euro Area's current account and could not, consequently, compare it with BEA data. In October 2018, the ECB revised its current account data vis-à-vis the United States. In the course of this revision, the ECB finally published the missing account on portfolio investment debits. Hence, we are now able to compare those figures. As data was not available prior to 2013, Figure 1.2 shows only five periods.

For now we can report the following: (1) the goods accounts are broadly in line. (2) the same is true for services accounts. (3) By contrast, severe discrepancies appear regarding primary income accounts. The total current account discrepancy yields 72 bn USD. Thus, we can divide the EU–US discrepancy amounting to 188 bn USD in 2017 into 72 bn USD that occur bilaterally between the Euro Area and the U.S., and 116 bn USD that occur between non-Euro Area EU member states and the U.S.

Figure 1.2: Eurozone–U.S. Current Account, bn USD



Source: BEA, 2018. ECB, 2018. Own illustration.

Note: Figures show balances; balances of Subfigure (b) are multiplied by minus 1 to reflect the "U.S. perspective".

[10] For instance, other sub-accounts "Primary Income, Labor Income" are so small that they can be safely neglected for a rough comparison of two current account balances.

1.3 Bilateral Discrepancies at the Member State Level

Eurostat balance of payments statistics are derived from national data.[11] Thus, in our next step, we take a closer look at important bilateral accounts, the objective being to identify the main sources of statistical discrepancies.

1.3.1 On the UK–U.S. Current Account

We start with the United Kingdom (UK). The Euro Area accounts for 73 percent of the size of the EU economy; the UK accounts for 15 percent and hence for more than half of the non-Eurozone EU. As reported, the latter accounts for a discrepancy of 116 bn USD between EU and U.S. sources, i.e., 62 percent of the total EU–U.S. discrepancy. Given the UK's importance in financial markets, which is relevant for both services trade as well as primary income, the UK is the most relevant non-Eurozone economy. In the UK, BoP data are compiled by the Office for National Statistics (ONS). Bilateral current account figures vis-à-vis major trade partners are available on a quarterly basis beginning in 1999.

Figure 1.3 compares ONS and BEA mirror data. It provides several interesting insights. First and foremost, the total discrepancy is enormous: in 2017, it amounts to 88 bn USD: the sum of a U.S. reported U.S. surplus of 52 bn USD and a UK reported U.S. deficit of 36 bn USD. Whereas the balance follows a clear upwards trend with a zero-balance in 2007 and surpluses thereafter according to BEA, ONS reports a U.S. deficit of 30 to 60 bn USD throughout the entire period of observation. Most recently, data on goods trade do not match, neither in terms of dynamics, nor in terms of balance sign or in terms of magnitude. Interestingly, in the first years in our data set, the two sources almost perfectly agree on the balance of the goods accounts. The most severe inconsistencies are found in the services accounts; both countries report surpluses that roughly doubled over time. Services balances alone yield a discrepancy of 51 bn USD in 2017.

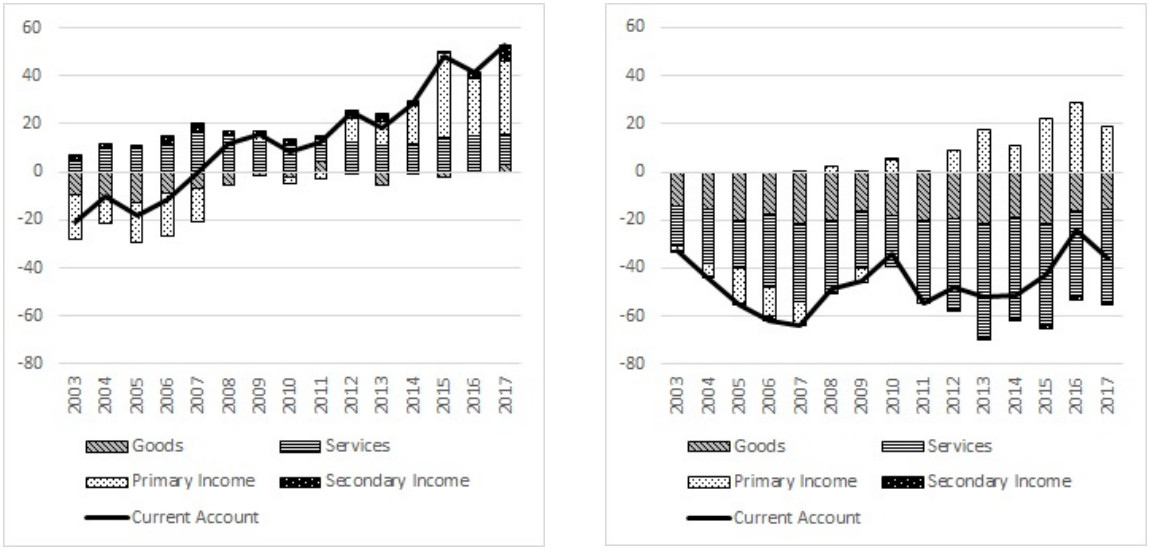
Second, primary income balance exhibits much more consistent dynamics. Despite some absolute discrepancies amounting to 11.6 bn USD in 2017, the co-movement of both sources over time is very high ($Corr = 0.91$). Hence, we can conclude that, in the UK–U.S. current account, services predominantly drive bilateral discrepancies. 88 bn USD, or almost half of the total EU–U.S. discrepancy can be traced back to the United Kingdom.

[11] Eurostat does not collect own data but processes data submitted by national statistical agencies or central banks. While Eurostat does conduct quality checks of national data, it has very limited means to enforce common standards.

Ironically, in the event of a Brexit, the accuracy of the EU–U.S. bilateral current account would improve substantially.

Figure 1.3: UK–U.S. Current Account, bn USD

(a) BEA **(b)** ONS



Source: BEA, 2018. ONS, 2018. Own illustration.

Note: Figures show balances; balances of Subfigure (b) are multiplied by minus 1 to reflect the "U.S. perspective".

For the identification of other large contributors to the EU–U.S. discrepancy, two observations are in order: (1) as the UK accounts for roughly three quarters of the 116 bn discrepancy between the US and non-Euro Area EU member states, the other main contributors to the data gap must be found within the Euro Area. (2) As primary income imbalances make up the lion's share of the total discrepancy, and given that the UK does not strongly contribute to these primary income imbalances, other large contributors must have close investment ties with the United States that result in large gross and net income flows. We suspect that profits of multinational enterprises located in the Netherlands and Ireland cause the large U.S. surplus in primary income. For the Netherlands, we directly observe this in the U.S. data; for Ireland we have do not have direct evidence.[12] The BEA does not publish bilateral data vis-à-vis Ireland.[13]

[12] Brad Setser has done research on the Irish current account and how it is shaped (or even distorted) by the activities of multinational enterprises, cf. Brad Setser's Blog, accessed on November 22, 2018.

[13] the Irish position is hidden in the aggregate "other Euro Area", which contains small Euro Area economies that are not separately listed elsewhere in the current account. Moreover, the Irish statistical office did not want to share their current account figures vis-à-vis the U.S. with the authors; however, upon request they have confirmed the existence of such data.

1.3.2 On the Dutch–U.S. Current Account

It has taken the authors some effort to get access to comprehensive bilateral current account data of the Netherlands vis-à-vis the United States. Interestingly, before we had started our investigations, all current account components available were online, except the primary income account. Now, these data are freely accessibly via the Dutch National Bank's (DNB) web site, too.

Figure 1.4 compares the official Dutch data with BEA data. A few things are noteworthy: the U.S. statistics show a slightly increasing goods balance, a constantly positive services balance since 2008, and a steeply improving primary income balance, which amounts to 69 bn USD in 2017. After all, the BEA claims a bilateral US current account surplus of 98 bn USD. According to Dutch statistics, the U.S. surplus is lower in the goods balance and higher in the services balance. This problem might arise due to classification problems in the field of contract processing, in which the BEA has not yet adopted BPM6 standards. Obviously, such distinction problems must leave the total current account unaffected. The large discrepancies stem from the primary income balance. According to Dutch sources U.S. primary net income fluctuates remarkably, which is unusual in times without major financial crises. During the last three years, the U.S. ran a surplus of 27 bn USD in 2015, a deficit amounting to 16 bn USD in 2016, and again a slight surplus worth 7 bn USD in 2017. The peaks in 2011 and 2014 (47 and 50 bn USD) stand out as well. Dutch data end in 2017 and report a U.S. current account surplus of 22 bn USD. The corresponding discrepancy yields 76 bn USD. This is slightly more than 100 percent of the total discrepancy between the U.S. and the Euro Area.[14]

The bilateral position between the U.S. and the Netherlands raises the question whether or not corporate profits are recorded correctly. The BEA discloses FDI income as the main source of U.S. primary income (Credit 76 bn, Debit 16 bn USD in 2017); the BEA reports U.S. FDI assets worth 847 bn USD and liabilities amounting to 355 bn USD.[15] Dutch current account data do not allow for such a detailed breakdown of sub-aggregates. However, according to Dutch data, bilateral FDI stocks of the Netherlands and the U.S. net out each other (U.S. assets 775 bn USD, U.S. liabilities 780 bn USD). Hence, the misunderstanding regards Dutch investment positions in the United States, and not U.S. investments in the Netherlands. Upon our request, DNB officials admit that they underestimate primary income of U.S. multinationals. They also argue that

[14] Mechanically, if national discrepancies occur in both directions (under- and overestimation of true figures) they cancel out. Thus, the total overall gross discrepancies of all Euro Area members with the U.S. can exceed the net discrepancy.

[15] The most recent figures are those of 2016. Values according to historical-cost basis.

primary income is generally underestimated so that the aggregate Dutch current account balance is not systematically mismeasured:[16]

"Regarding the differences between the US and NL: it is likely that NL underestimates the primary incomes to the US (and that the US figure is therefore better). On the other hand, NL also underestimates the primary incomes from other countries (DE in the example), so that the current account balance of the Netherlands is not distorted." [17]

Figure 1.4: Dutch–U.S. Current Account, bn USD

(a) BEA **(b)** DNB

Source: BEA, 2018. DNB, 2018. Own illustration.

Note: Figures show balances; balances of Subfigure (b) are multiplied by minus 1 to reflect the "U.S. perspective".

1.3.3 On the German–U.S. Current Account

The German Bundesbank provides quite detailed data on bilateral current account positions. Figure 1.5 illustrates the German–U.S. current account balances. The comparison between German and American official data exemplifies that, even in the presence of some discrepancies in absolute levels, dynamics as well as magnitudes can very well be

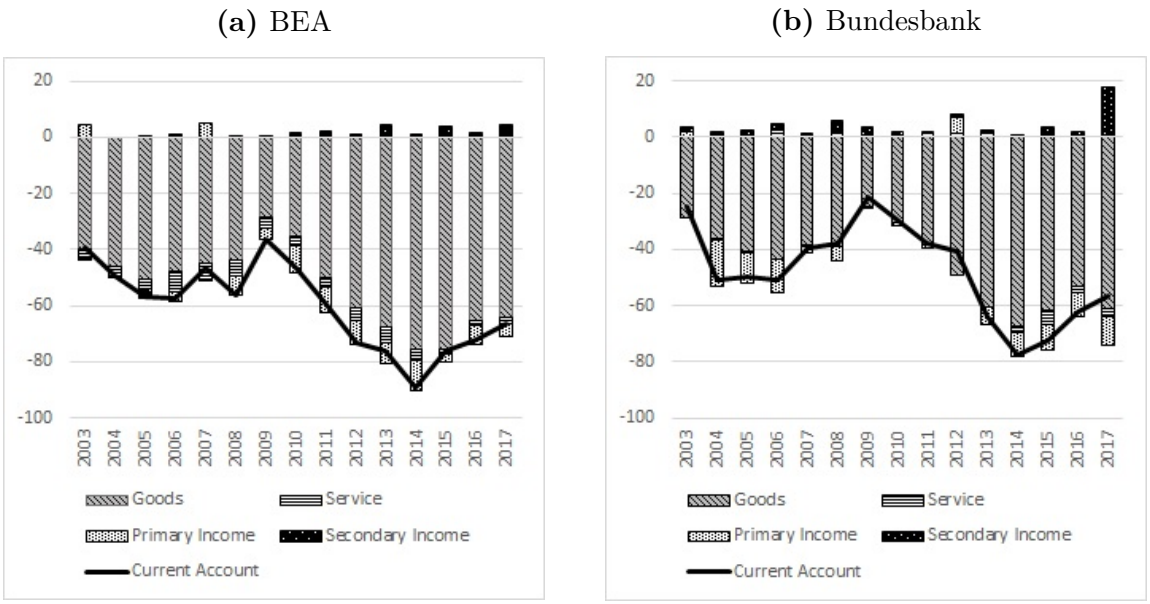
[16] This may well be the case; for our purposes it suffices to notice that the Dutch data probably underestimate U.S. primary income, and this leads to an underestimation of the U.S. surplus relative to the EU.

[17] Personal email correspondence, received on October 25, 2018, subject: "Dutch Balance of Payment – Dossier: 4930".

in line between major trade partners that report a very large number of transactions.[18] Since the good comparability of German and U.S. data is relatively persistent over time (and also appears at the quarterly level), one can rule out methodological differences as a reason for the large EU–U.S. discrepancies. Even if the ECB and the BEA interpret BPM6 differently at some points, the Bundesbank, which complies with ECB standards, and the BEA do not come to substantially different results for the German–U.S. current account.

The high degree of co-movement of the two statistics allows drawing two conclusions only: either, both the BEA and the Bundesbank report correctly and both their data reflect economic ties accurately. If so, we have no reason to doubt the capability of the BEA to also correctly report current account figures with other EU member states. The second possible solution: both the Bundesbank and the BEA are wrong and systematically misreport in a way that creates similar outcomes. This seems highly unlikely. In our opinion, the main take-away of this picture is that the Bundesbank validates U.S. data. Hence, if one wants to blame the BEA for being the origin of the misreporting with respect to the UK and the Netherlands, he or she owes an answer on how U.S. data can be so accurate with respect to Germany.

Figure 1.5: German–U.S. Current Account, bn USD



Source: BEA, 2018. Bundesbank, 2018. Own illustration.

Note: Figures show balances; balances of Subfigure (b) are multiplied by minus 1 to reflect the "U.S. perspective".

[18] The U.S. is Germany's largest trade partner (246 bn Euro in 2018 of services and goods exports and imports together); Germany is the 5th largest U.S. partner with a reported total turnover of 252 USD in 2018.

1.3.4 On Other Bilateral Accounts

We have invested substantial time into understanding data provided by Banque de France. We are grateful for the bank for sharing its data and hosting us in Paris, but the details of our work have to remain confidential. However, we can say so much: The French data is in line with the BEA; hence, France does not appear responsible for exceptionally high bilateral discrepancies with the U.S.

Italy is another country for which the BEA provides separate bilateral accounts. We have not been successful in entering into constructive discussions with Banca d'Italia. However, the descriptive exercise presented above shows that we are able to attribute large shares of the bilateral EU–U.S. discrepancies to only two countries, namely the Netherlands and the United Kingdom. This does not mean that Italian data necessarily match those of the U.S., but the likelihood for Italy to be a major source for discrepancy is low.

The source of discrepancy in the Dutch case is the primary income account, in the UK case it is services. This is not surprising given that the Netherlands are by far more attractive for corporate profit shifting than the United Kingdom, which is traditionally Europe's biggest player in financial services.

1.4 Attempts towards Interpretation

The question whether the U.S. has a current account surplus with the EU or the other way round is politically sensitive; the above quote from the G20–Summit Declaration of 2019 shows this quite clearly. Moreover, as discussed above, the transatlantic data gap is large, systematic and persistent. Thus, one should not dismiss it as pure measurement error.

This is not to say that measurement issues do not loom large. They do; in particular with respect to services and primary income, where the country of residence of transaction parties are hard to ascertain. However, in case of pure measurement error, discrepancies should average out over time and space. This is not the case. There are two other explanations that warrant investigation. First, EU countries and the U.S. could apply different accounting rules to the same transactions. Second, even if they apply the same formal rules, there is substantial leeway in how exactly to apply them.

For very good reasons, there are international conventions governing the construction of the balance of payments. The current incarnation of those rules is the Balance of Payments Manual 6 (BPM6). All EU countries and the U.S. are committed to the BPM6,

but not all provisions are applied. For example, the U.S. do not apply the standard on contract processing (Howell et al., 2017); this might blur the proper statistical distinction between goods and services accounts but still leaves the overall current account balance unchanged. Similarly, the fact that U.S. multinationals make use of differences in EU corporate tax policies cannot explain the aggregate current account imbalances; from an accounting perspective, a conversion of services receipts into primary income leaves the aggregate current account positions unaffected, changing the composition of the balance sheet only but not its overall length.

Hence, to understand the discrepancies, we must identify types of measurement error without offsetting counter entries in the current account. Chesson et al. (2018) highlight several reasons that might cause bilateral discrepancies in the UK services statistics with the U.S. For instance, the U.S. includes the Crown Dependencies to the UK economic territory, which are excluded by British official statistics.[19] Moreover, both the UK and the U.S. have a traditional orientation towards services. Gross services as well as primary income flows might be inflated due to high economic activity in the financial hubs of London and New York City. These two current account components are particularly error-prone. However, other countries with high exposure to gross financial flows, e.g., many bond market clearing houses located in Belgium or Luxembourg, do not cause such severe discrepancies. So, it is probably not sufficient to point towards financial centers to explain the puzzle.

Probably more important, as with all accounting practice, there exists substantial leeway to interpret the rules in one way or the other. A systematic interpretation of rules with the objective to minimize primary income receipts (in the EU) or to maximize net trade (in the presence of a mercantilistic bias in the U.S.), can explain the results highlighted in the previous section. But why should countries lean in one way or in the other? One way to produce educated guesses is to ask the "Cui Bono" question: who benefits from a specific interpretation of rules? Before we ask that question, we look more deeply into the scope for manipulation in the services and the primary income accounts.

1.4.1 Measurement Issues and Statistical Discretion: Services

For historical reasons, statistical regimes in the EU differ by member state, and various reasons suggest that data quality for goods trade is better than for services trade. First, due to its lower economic relevance in the past, efforts have primarily been made on establishing international standardization for goods trade and less so for services trade.

[19] The Crown Dependencies are the Isle of Man and the Bailiwicks of Jersey and Guernsey.

Second, because tariffs are not imposed on services, only goods imports are a source of government income. Hence, ensuring a high quality of statistical recording of goods crossing international borders has always been in the interest of governments.[20]

Third, data quality increases in the average size of transactions due to de minimis thresholds below which transactions are exempted from reporting requirements. Most recently, a trend of dis-intermediation has been observed: in the past, exports mostly were business-to-business transactions; nowadays, the intermediator, e.g., a domestic importer, is becoming obsolete as consumers and firms directly order from foreign suppliers, often in very small quantities. When trade mainly consists of large business-to-business transactions, there is no systematic export bias. However, when trade becomes more and more business-to-consumer, an increasing export bias will become prevalent, as the exporting company does record the cross-border transaction while the importing consumer does not. In a case where low value transactions are performed with high frequency, statistics systematically under-report true import figures. Thus, e-commerce is a growing challenge for statisticians especially in the correct recording of services transactions.

According to German foreign trade legislation, every transaction worth more than 12.500 EUR must be reported to the Bundesbank. On this basis, it compiles German services trade statistics. Subsequently, all payments below this threshold go missing in statistical recording. Furthermore, statistical practice does not follow a unified framework in the EU. This is best exemplified by comparing German and British practices: whereas German statisticians fully cover all transactions above a certain threshold, British authorities conduct a survey based on a partial census and then project national figures.

U.S. multinational enterprises are often located in the Netherlands or Ireland, from where they serve the entire EU single market. Consider the following example: a German resident pays for a movie accessed via iTunes. As Apple Europe is located in Ireland, this is technically a German services import and accordingly an Irish services export. As Apple Ireland is owned by U.S. residents, this transaction generates positive U.S. primary income (assuming that it was a profitable transaction). When Apple Ireland reports this transaction to Irish statisticians, bilateral German-Irish services accounts deviate due to non-reporting in Germany. Data support this claim: according to Eurostat, Germany has a self-reported bilateral deficit in its services trade with Ireland amounting to 4.7 bn EUR, while the mirror account reported by Ireland shows an Irish surplus of 6.7 bn EUR, which is 43 percent above the German number. Helbling and Terrones (2009) argue similarly with respect to the global services surplus. These low-value transactions

[20] But less so in a customs union like the EU where 80 percent of tariff revenue is absorbed by the central budget and only 20 percent remain in the collecting member state.

for digital services are increasingly important and may distort bilateral services accounts in the EU.[21] However, the external position vis-à-vis the U.S. is thereby unaffected.

With respect to the UK–U.S. services discrepancy, we record the following: in the past 15 years, there was no single year in which both sides reported at least the same sign of the balance. If e-commerce becomes a problem for statistical recording nowadays, it clearly cannot have been the reason for misreporting over the entire period under investigation. As these two economies both host important hubs for global financial markets, it is plausible to locate the reason for the discrepancies in the financial services trade; this is also hypothesized by Howell et al. (2017). Large market places such as the City of London or Wall Street provide access to liquidity for any kind of financial transactions to financial intermediaries around the globe; the provision of liquidity is economically an insurance service and the risk premium contributes to the income of the service provider, e.g., the London Stock Exchange or the NYSE.[22]

However, it is unclear how this kind of services can be reflected in bilateral current account figures. The value of the market-place increases in the number of its participants due to network externalities. Hence, the partner-country attribution of such profits is not straight-forward. Consider the following: when one breaks down the British financial services exports, which arise from the providing a market-place, to different countries according to the size of gross flows, the U.S. would certainly be assigned a great portion. This is not only because U.S. residents conduct their businesses in London, but is also due to transactions that are conducted via U.S. financial intermediaries in which no American capital is involved. Hence, the "fair share" for the U.S. could be overdrawn.[23] The same holds true vice versa for U.S. services exports to the UK and may explain the excess surpluses that both countries claim to run bilaterally. With respect to the aggregate EU–U.S. services discrepancy, the Eurostat report on the transatlantic discrepancies in services trade notes the following:

"Further, US financial services exclude financial intermediation services indirectly measured (FISIM), and US insurance and pension services exclude pension services. These deviations from the BPM6 standard result from a lack of available source data. (...) Inter-

[21] The relevant firms (Amazon, Apple, Facebook, Google, Microsoft, Netflix) are all located in Ireland, Luxembourg, and the Netherlands. Services provided by those companies include software licenses, cloud storage, streaming services, et cetera.

[22] Note that many financial transactions themselves are not accountable in the current account at all. Selling Pound Sterling against the Dollar only changes the composition of international investment positions. Accountable in the current account, however, would be profits and losses that could materialize for either party involved.

[23] If the world consists of countries with similarly important financial hubs, this overestimation would net out. In fact, the financial industry is relatively concentrated in very few financial centers.

estingly, US-reported financial services exports consistently exceed EU-reported imports. Therefore, if the United States were to introduce a measure of FISIM, it would further exacerbate this asymmetry." (Howell et al., 2017)

1.4.2 Measurement Issues and Statistical Discretion: Primary Income

Methodological differences. There is widespread consensus among statisticians that primary income balances are particularly prone to bilateral discrepancies. In the case of FDI income, the bone of contention is its geographical assignation: are dividends of foreign-owned firms assigned to the location of their ultimate beneficiary, or to the location of the immediate counter-party? The underlying problem is equivalent to the Rotterdam effect in goods trade.[24] The BPM6 seems quite clear and recommends the following for the preparation of international investment positions:

"Partner data on asset positions are classified to the partner economy according to the residence of the issuer, not other factors such as the place of issue, the residence of a guarantor, or the currency of issue. Similarly, partner data on liability positions are classified according to the residence of the holders. In practice, identification of counterparty for securities positions, income, and transactions is difficult for various reasons, including that (a) the issuer is not always aware of current holders of securities, (b) transactors in securities markets may not be aware of the identity of the counterparty, and (c) security holders may be unaware that income on securities positions may be payable by a financial intermediary that created a "short" or reverse position in the security rather than by the issuer of the security." (BPM6 § 4.152)

However, when it comes to BoP transactions, the BPM6 deviates from the above stated principle and gives national statisticians notable degrees of freedom:

"For balance of payments transactions, the partner attribution could be made on the basis of the parties to the transaction (namely, the buyer and the seller, the so-called transactor approach), or for assets owned, the residence of the issuer (the so-called debtor creditor approach). In these cases, it is acceptable to adopt a convention for partner attribution of assets owned based on the residence of either the counterparty to the transaction or the issuer." (BPM6 § 4.154)

[24] Inflated Dutch trade statistics due to the importance of the port of Rotterdam. Goods are unloaded in the Netherlands, but final consumption occurs somewhere else in Europe.

From a technical point of view, the direct transactor approach better suits the fundamental logic of BoP statistics. Also, for goods trade recording, the final consumption does not matter, but the intermediate trade flow does. When considering data collection, the direct transaction approach seems to be simpler and less error-prone due to better observability. In particular, for financial outflows (debit accounts), the location of the final counter-party is hard to identify. If one thinks of a subsidiary in Germany owned by a Dutch holding, ultimately controlled by a New York based investment fund, whose shareholders are spread around the globe, the correct geographic assignation of corporate profits is not straight-forward (and the length of the chain of intermediaries has increased in practice). On the other hand—and acknowledging these complexities—the ultimate beneficiary principle is economically preferable over bilateral figures that are blown up by transitory flows that cancel out multilaterally. And, therefore, trade statistics would be considerably more telling if they were based on value added and consumption and not on gross flows. Whatever approach is applied has no impact on a country's overall current account. However, bilateral accounts become incomparable when reporting methods differ across countries. Hence, the uncoordinated application of different reporting principles is the biggest threat to data reliability.

In contrast to financial outflows, financial inflows (credit accounts) are much easier to trace. Thus, central banks as well as statistical offices exchange mirror data based on credit accounts for the proof of consistency with their debit data. However, as the large and persistent discrepancies in EU–U.S. primary income account demonstrate, current levels of coordination are clearly largely insufficient. Moreover, the exact data compilation is still not transparent and information thereof is frequently contradictory. For example, some statisticians have reported to the authors that bilateral primary income flows are based on imputed values by simply assuming investment income is equally distributed as investment stocks (which, in turn, are based on the ultimate beneficiary principle). Then, of course, also BoP statistics mix the ultimate beneficiary and the direct transactor approaches.[25] The BEA and the DNB have both confirmed to compile their BoP statistics based on the transactor approach. Hence, we can rule out methodological differences being the source for this very large discrepancy with respect to primary income.

Tax avoidance and tax fraud. The valuation of corporate profits highly depends on national tax legislation, which is not harmonized among EU member states. Stock repurchases, retained earnings, the effect of patent boxes, value adjustments for brand

[25] In the earlier version of this chapter, we have also highlighted that bilateral investment positions reveal discrepancies in similar magnitudes (Felbermayr and Braml, 2018). Thus, all calculations based on investment stocks need to be interpreted with great caution, too.

names, hypothetical depreciation of intangibles, or the capitalization of R&D expenditures all pose the very fundamental question of what a profit, from an economic point of view, actually is. However, as multinational enterprises generally comply with standard international accounting rules (IFRS or U.S. GAP), a certain degree of international harmonization can be assumed. Of course, legal issues will have an impact on primary income accounts and make them prone to error (de Haan and Haynes, 2018), but by the mere fact that Euro Area–U.S. discrepancies mainly occur between the Netherlands and the U.S., this can hardly be the only reason.

Corporate tax planners have set up schemes to locate specific legal entities of multinational enterprises in certain countries with the aim of tax base erosion and profit shifting. These nested corporate structures—think of the famous "Double Irish with a Dutch Sandwich"—lead to situations in which corporate profits are not taxed anywhere, because either tax authority assumes taxability for the other country. Using such legal fictions, firms become tax residents of nowhere. Often, third countries (tax havens outside the EU and the U.S.) are part of this game as well, which obviously leads to distorted bilateral primary income figures between the EU and the U.S. If the BEA assigns profits to Dutch or Irish subsidiaries of U.S. MNEs, while the Netherlands and Ireland may either not report these profits at all or assign them to third parties, such as the Bahamas, Bermuda, or Cayman Islands, bilateral distortions naturally occur. Zucman (2013) has estimated that 8 percent of global financial household wealth—mainly located in tax havens—is statistically not recorded. This would obviously have effects on BoP statistics.

1.4.3 Some Speculative Answers to the 'Cui Bono' Question

Economic statistics are important for policy making, domestic as well as international. Governments sometimes fall prey to the temptation to massage data and statistics to suit their purposes. There is ample anecdotal evidence for such behavior, from the case of Greece misreporting data relevant for its accession to the European Monetary Union to the frequent attempt to embellish government deficit figures before elections (Jong-A-Pin et al., 2012, Reischmann, 2016).[26]

Data on international transactions may be subject to similar pressure. In many countries, a positive current account surplus is a matter of national pride, a deficit of shame. Economists criticize such positions, but this mercantilistic bias is hard to root out. Sometimes, politicians might be interested in high deficits if it suits their narrative of national

[26] Cf. Report of the EU Commission on Greek Government Deficit and Debt Statistics, January 2010, accessed on August 3, 2019.

decline. The Trump administration, e.g., has attempted to change the calculation method for the U.S. trade deficit in a way that it would have lowered export figures (thereby overstating the trade deficit, in particular with certain countries like Mexico).[27]

Even if statistical offices enjoy high degrees of independence, such bias can lead officials to systematically overstate exports and underestimate imports. Such a bias should affect all sub-accounts of the current account equally, except the secondary income account, where a negative balance indicates international generosity, or a low dependence on foreign aid.[28] Obviously, such a bias causes discrepancies in balance of payments statistics and creates excess surpluses. Nevertheless, assuming such a bias is constant over time and across countries, it cannot explain why the bilateral discrepancy increases over time (in the case of the UK) or why notable discrepancies occur only between certain countries (UK–U.S., Netherlands–U.S. but not Germany–U.S. or France–U.S.).[29]

Who has incentives to exaggerate or understate the EU–U.S. bilateral current account data? In the following we briefly look at the U.S. and at the EU with the largest bilateral data discrepancies. Quite clearly, in the U.S., at least since the Reagan administration and very strongly so under the current President, the political narrative is that the country is treated unfairly by its trade partners, including the European ones. A current account surplus reported by the BEA therefore undermines the credibility of this narrative and undermines the bargaining power of the White House. So—if at all—the U.S. has an incentive to under-report their current account vis-à-vis the European Union but not to over-report.

Things might be different in the Netherlands, which we have found to be quantitatively important for the overall discrepancy. The existence of a highly negative Dutch primary income balance vis-à-vis the U.S. is grist to the mill of all those who criticize the Netherlands for their corporate tax practices. Consequently, the Netherlands may have an incentive to under-report investment income liabilities. It is hard to prove such a

[27] The Wall Street Journal has first published an article (*click here*, accessed on August 3, 2019) that described the proposed reform. Accordingly, re-exports (exports of imported goods) should be removed from export statistics. Peter Navarro, Director of the Office for Trade and Manufacturing Policy, stresses the point, also published in the Wall Street Journal (*click here*, accessed on August 3, 2019), that this measurement would better reflect bilateral economic relationships. Principally, the authors would agree with him since this accounting method resembles what is called "trade in value added". However, the proposed reform was inconsistent as it does not similarly adjust for imports (removal of re-imports), and would have overstated the U.S. trade deficit. One could suspect that the reform proposal was either amateurishly elaborated, or intentionally misleading.

[28] E.g., the secondary income account typically consists of development aid and contributions to international organizations. Thus, donors (negative balance) may want to claim even more donations than the actual ones, while receivers (positive balance) may want the opposite.

[29] But the export bias may explain why the world as a total runs a trade surplus with itself.

claim, of course, but our discussions with DNB officials have tentatively confirmed our view.

The United Kingdom is not commonly known as tax haven to the same degree as Ireland or the Netherlands. However, the UK applies special tax rates on patent income, which reduces corporate tax rates from 21 to 10 percent; nevertheless, the UK patent box scheme is less generous than others (Alstadsæter et al., 2018).

Can over-reporting be in the interest of Ireland? For confidentiality reasons, Irish officials did not want to share their bilateral BoP data vis-à-vis the U.S. with us. First, in case Ireland would not contribute to these discrepancies, an incentive exists to relax confidentiality clauses and disclose the relevant figures. Second, bilateral balance of payments data with large economies as the U.S. are data on a very aggregate level; why should these data remain confidential at all? And even when there are large gross transactions of single corporations, which would justify confidential treatment, at least the balance cannot reveal any private information. Moreover, Eurostat compiles and publishes bilateral BoP data of all EU member states with each other; why would this data be less confidential? To the authors, confidentiality is a threadbare argument.

The OECD together with G20 has come up with an action plan on corporate taxation with the objective to lower tax avoidance by multinational enterprises. Countries such as Ireland, the Netherlands, and the United Kingdom have signed up to the so-called BEPS Agreement,[30] and, therefore, political considerations might play an important role with respect to bilateral current account figures as they ultimately highlight all cross-border transactions.

Please note that our claims above are tentative presumptions, based on rational considerations that are plausible to us. We have raised questions that we believe are important, but we do neither claim completeness nor ultimate truths. The discrepancies in bilateral current accounts, as well as the global surplus, is still one of the most important empirical puzzles in the international economics literature, which needs to be solved urgently.

1.5 Concluding Remarks

This chapter contributes by illustrating magnitudes and dynamics of statistical bilateral EU–U.S. balance of payment discrepancies. From 2009 to 2017, EU and U.S. sources have disagreed by an cumulative sum of more than 1 Trillion USD. The transatlantic data gap is mainly due to services trade and primary income. Taking all available data into account,

[30] Base Erosion and Profit Shifting Agreement. For an overview, see Avi-Yonah and Xu (2017).

we can show that the EU–U.S. current account discrepancies are, by and large, driven by two countries: the United Kingdom and the Netherlands. In contrast, official European data is in line with U.S. data for other EU member states, most notably Germany and France. Hence, there is no reason to believe that methodological differences between EU and U.S. authorities with respect to data compilation have caused these discrepancies. In the case of the Netherlands and the U.S., methodological differences (ultimate beneficiary vs. direct transactor approach) also can be ruled out according to consistent information provided by the relevant authorities.

In times of trade conflicts inspired by mercantilistic thinking, the suspicion that U.S. data better reflect "the truth" may be politically advantageous from an EU perspective. However, it also highlights severe problems in official European statistical data. This incapacity is best testified by officials from the Dutch National Bank who report that "*the US figure is therefore better*".

According to *The Economist*, which has discussed global discrepancies in an article in 2011, "*rich countries trade statistics tend to be more reliable than those of emerging economies, where data collection is less developed*".[31] In light of our analysis, this claim looks mistaken since the EU and the U.S., two developed entities, are the origins of very severe discrepancies. These are too large and too persistent to be dismissed as random measurement error. If the discrepancies are due to methodological differences between EU member states in exploiting leeway in international rule books, one might be questioning who has incentives to make use of this possibility. One possible explanation might be that tax haven countries have every interest to downplay their huge primary income debit positions. This may also explain the missing political willingness in some countries to resolve the poor data situation.

As long as data quality does not substantially improve, the quality of quantitative research in international trade and macroeconomics, as well as that of research-based policy advice necessarily suffers. Our advice to the EU and its member states: first, improve data compilation and preparation particularly in the field of e-commerce and services trade. Second, take actions on tax havens to both curb tax avoidance and improve data quality with respect to primary income accounts. Third, increase transparency and get rid of meaningless confidentiality clauses that keep bilateral national current account positions undisclosed. Fourth and finally, hope that President Trump will continue trusting American statisticians more than European ones.

[31] The Economist, November 12, 2011, accessed on December 20, 2018.

Chapter 2

On the intra-EU Current Account Surplus

"This article shows that official statistics substantially underestimate the net foreign asset positions of rich countries(...) Absent automatic information exchange, tax data may well remain an unreliable source to capture the offshore wealth of households."

Zucman (2013)

"The national accounts of the United States, for example, understate the U.S. position in Chinese firms by nearly $600 billion, while China's official net creditor position to the rest of the world may be overstated by as much as 50 percent."

Coppola et al. (2020)

2.1 Background and Related Literature

The world runs a current account surplus with itself (Gros, 2017): a logical impossibility that must result from measurement error or from—possibly fraudulent—misreporting. This global current account surplus is mainly driven by the trade balance, and not by primary income statistics, which are known to suffer from measurement error. This fact—that we refer to as the world's self-surplus—has prompted Krugman (2010) to develop a humorous theory of "interstellar trade".

Less well-known, the European Union has been running massive trade surpluses with itself over years, amounting to 307 bn Euro in 2018 or 86 percent of the entire global self-surplus in 2018. The EU's self-surplus is bigger than the frequently criticized current account surplus of Germany[1], and larger than the GDP of the eight smallest EU Member States combined. It is too big to be lightheartedly discarded as an irrelevant if amusing fact. Rather, we argue that the discrepancy may result from massive fraud in value added tax (VAT) declarations, amounting to up to 64 billion Euro. Domestic transactions declared as exports are not subject to VAT. Hence, firms have an incentive to over-report export figures. On the aggregate level, this may yield a credit-bias in intra-European Balance of Payments (BoP) data and can explain the EU's trade self-surplus.

Recently, probably due to increasing international economic tensions, current account (CA) statistics have attracted unusual attention both from policy makers as well as academics. For instance, there is substantial uncertainty about whether the EU has run a bilateral CA surplus or a deficit with the US over the past decade. In times of trade conflicts, the absence of a definite answer is troublesome; see Braml and Felbermayr (2019) for an illustration and tentative interpretation of transatlantic facts. The underlying problem, however, is broader: international transaction data are of poor quality, due to negligence, strategic government manipulation, and fraud.

To the best of our knowledge, ours is the first paper that offers a systematic discussion and analysis of the EU's self-surplus.[2] We provide novel evidence by *(i)* describing the magnitudes and dynamics of the discrepancies in the intra-EU current account, by *(ii)* decomposing the self-surplus according to the sub-accounts in the current account, by *(iii)* investigating the contributions of single EU Member States, and by *(iv)* the interpretation of our findings based on forensic accounting methods. For example, we show that goods

[1] In the Euro Area, the large surpluses of Germany and the Netherlands vis-à-vis other Euro members have provoked difficult political discussions; see Bonatti and Fracasso (2013), Gros (2012), Kollmann et al. (2015).

[2] The mere fact has been highlighted by Eurostat; see Eurostat 2018, accessed on April 10, 2019.

and services trade contribute almost equally to the observed discrepancy, and that the persistence of the discrepancy makes random statistical errors unlikely culprits for the patterns. As we argue later in this chapter, VAT fraud is a plausible explanation for the credit-bias that is prevalent in European CA statistics.

For very good reasons, economists usually deem bilateral current account balances irrelevant from a macroeconomic perspective (Feenstra et al., 1999, Mankiw, 2018). However, they are of great importance for bilateral economic relations, in particular in the context of trade conflicts.

Discrepancies in so-called mirror data are statistical artifacts prevalent in many international data with dyadic dimension.[3] In principle, any market transaction involves the documentation of corresponding values by buyer and seller. After correct summation, balances must necessarily mirror each other: all countries' exports are equal to all countries' imports; this is a mechanical accounting process and holds true by definition. However, in reality, perfectly corresponding mirror data are the exception rather than the rule. Frankel (1978) discusses potential reasons for the worldwide current account deficit in the 60's and 70's. This debit-bias, however, has turned into a credit-bias in the early 2000's. Helbling and Terrones (2009) suggest that time lags in international transportation might lead to lagged recording of imports relative to exports; in a world of rapidly growing trade, global surpluses would be a necessary consequence. According to this explanation lengthy shipment processes and high growth rates distort trade figures. This bias should even revert, when global trade shrinks.

Considering the geographical proximity of EU Member States and the resulting possibility for land transportation, the relatively weak economic growth, as well as the fact that services trade is equally affected, leads us to assume that other reasons must lie at the heart of the observed discrepancies. Ferrantino et al. (2012) investigate discrepancies in goods trade between the US and China and link them to VAT fraud and tariff evasion. As tariff evasion can be ruled out for transactions within the EU customs union, our interpretation focuses on VAT fraud.

The remainder of this chapter is structured as follows: Section 2.2 discusses relevant conceptual issues and reports the main finding: the EU's self-surpluses. Section 2.3 focuses on those Member State pairs exhibiting the most severe discrepancies and tries to identify the countries responsible. Section 2.4 turns to VAT fraud as an explanation

[3] To be clear, in the following analysis, we do not focus on bilateral CA *imbalances* but *discrepancies*. Imbalances occur if country A and B exchange different amounts of goods and services, which is true for many country pair relationships. Statistical discrepancies occur if a transaction between A and B is recorded differently by the sender (exporter) and the receiver (importer). In other contexts, CA discrepancies describe the statistical difference between the current and the financial account.

for the observed discrepancies and provides an outline for a potential solution. Section 2.5 concludes.

2.2 Aggregate EU Self-Surpluses

Subsection 2.2.1 recaps accounting concepts in the context of balance of payments statistics. Subsection 2.2.2 and 2.2.3 show the EU self-surplus in trade and in the secondary income account, respectively.

2.2.1 Current Account Data

To provide a full picture, all main items in the current account need to be covered: goods trade, services trade, primary income, and secondary income.[4] In a world without reporting issues—where mirror data match perfectly—the following two account identities must hold:

1. All sub-accounts of the intra-EU current account sum to zero.
2. The aggregate intra-EU current account sums to zero.

Identity 1 is self-evident. If it holds, Identity 2 holds as well. Even if Identity 1 is violated, Identity 2 can still hold. This could be the consequence of demarcation problems.[5] Such demarcation problems emerge with "servitization", i.e., the increasing services content embodied in manufacturing exports caused by related software, design, financing, or maintenance tasks.[6] Also, some transactions may misleadingly appear in primary income accounts rather than in services trade accounts. This can be the case when countries do not provide services associated with intangible assets directly but through tax havens. Typically, such demarcation issues cancel each other out after aggregation.

For the purpose of the present analysis, we rely on balance of payments (BoP) data provided by Eurostat only.[7] This rules out methodological differences in data compilation or differences in the interpretation of the Balance of Payments Manual 6 (International

[4] Primary income refers to receipts and payments of employee compensation paid to non-resident workers as well as investment income (receipts and payments on direct investment, portfolio investment, other investments, and receipts on reserve assets). Secondary income designates current transfers between residents and non-residents, i.e., payments without quid pro quo such as remittances, international cooperation payments, or cross-border fines. Cf. International Monetary Fund (2009).

[5] The different treatment of the same transaction by statistics authorities in different countries.

[6] For a broad overview, cf. Baines et al. (2009).

[7] The main data source for CA figures is the series *bop_c6_q* in the version from November 2019.

Monetary Fund, 2009) by reporting countries.[8] Please note that for Malta data are either not recorded or not published. Values are denoted in Euro. We apply the term "discrepancy" to refer to corresponding import-export statistic which fail to match each other. Aggregate discrepancies are also referred to as *self-surpluses* or *self-deficits*, respectively. Unless not specified otherwise, imports and exports include the sum of goods and services trade. Unfortunately, primary income accounts are not accessible. Thus, we cannot provide a full picture of the total CA discrepancy. In contrast, secondary income accounts data are available and will be subject of this analysis.

2.2.2 The EU's Trade Self-Surplus

First of all, we present the overall trade balance for the EU and the Euro Area with themselves. For this purpose, we sum up trade balances of all EU (Euro Area) Member States vis-à-vis all EU (Euro Area) Member States.

Figure 2.1 shows that both the EU and the Euro Area run substantial trade self-surpluses; evidently, Identity 1 has been violated for the past 12 years. In 2018, the total self-surpluses (goods and services) amount to 307 and 126 bn Euro, respectively. These self-surpluses equal 1.9 and 1.1 percent of the respective nominal GDP levels. The mere size of the intra-EU trade discrepancy is stunning: in absolute numbers, it is more than the combined GDP of the EU's 8 smallest economies.[9] Dynamics of the shown discrepancies reveal that these self-surpluses are persistent over time: over 12 years of observation, the EU and the Euro Area ran surpluses that cumulatively amount to 3 and 1.6 trillion Euro. While, for the Euro Area, the total discrepancy fluctuates between 0.5 and 1 percent of the GDP for almost one decade, the intra-EU discrepancy increases and now reaches levels close to 2 percent. From 2013 onward, both the EU and the Euro Area exhibit a strong growth in the services trade self-surplus. When it comes to he EU, 46 percent of the total discrepancy are due to services trade. In the case of the Euro Area this share amounts to 31 percent in 2018. Any major difference between the EU and the Euro Area can very likely be largely attributed to the United Kingdom.[10] Overall, these discrepancies can hardly result from random measurement errors; otherwise one would expect the time series to be stationary with mean zero.

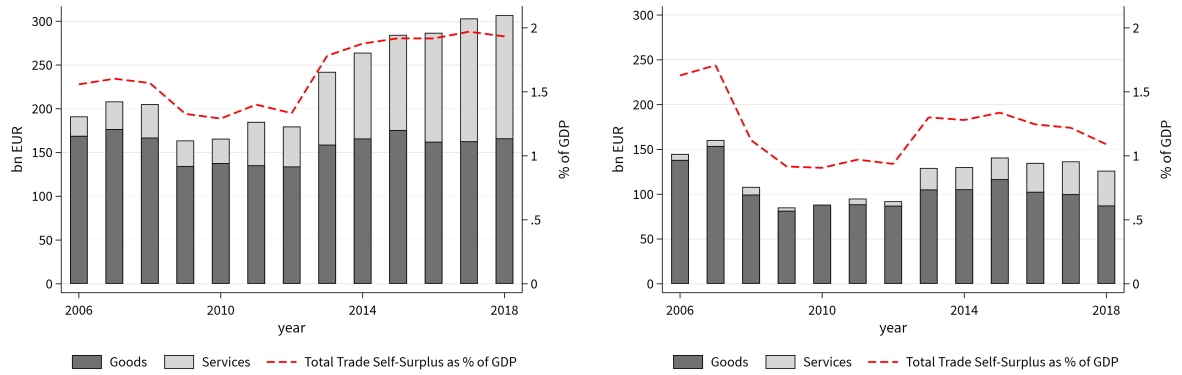
[8] Find here the IMF BPM6: www.imf.org/external/pubs/ft/bop/2007/bopman6.htm.

[9] According to Eurostat's nominal GDP figures for 2018.

[10] Our previous analysis has shown that UK figures are also the reason for substantial service trade discrepancies of the EU with the United States (Braml and Felbermayr, 2019). Thus, the UK statistical recording of service trade not only contributes to EU–US current account discrepancies, but also distorts intra-EU BoP figures quite substantially.

Figure 2.1: EU and Euro Area Trade Self-Surpluses, bn EUR and % of GDP

(a) EU **(b)** Euro Area



Source: Eurostat, 2019. Own calculations.

Note: Left scale in bn Euro refers to the bars, right scale in % of nominal GDP refers to the dashed line. Figures show balances of the goods and services trade BoP accounts.

Are there severe classification issues between services and goods trade in the European data? If that was the case, one balance would have to show a self-surplus and the other a self-deficit. This is not the case: for both the EU and the Euro Area, the total discrepancy of the net exports is almost perfectly equal to the total of discrepancies of the goods balance and the services balance.[11]

2.2.3 The Secondary Income Puzzle

As mentioned, data on primary income are not available. Therefore, intra-EU current account balances cannot be constructed. Thus, it is beyond the scope of our analysis to test Identity 2. However, we can aggregate the goods, services, and secondary income balances, to test if the inclusion of the secondary income balance reduces the self-surpluses. In contrast to many other advanced economies, intra-EU secondary income balances are particularly informative, because the EU redistributes income among its Member States and EU migrants channel very substantial flows of personal transfers to their home countries.[12] In 2018, the aggregate secondary income balance for the EU with itself yields a self-deficit of 98.2 bn Euro, or 0.6 percent of the Union's GDP. This is remarkable: a negative secondary income balance is associated with net payments to international organizations such as the EU, direct transfers (official development aid), or

[11] Net exports are constructed as the difference between exports and imports.

[12] According to Eurostat, intra-EU remittances amount to 70 bn Euro in 2018. A large fraction of this, however, is compensation of employees which accordingly is part of the primary income account.

any other transaction that misses the character of an economic exchange. Frankel (1978) argues that the secondary income accounts typically entail a debit-bias since negative balances indicate national generosity: net donors (recipients) may tend to over-report debits (under-report credits). Possibly, the self-surplus in the EU trade statistics may partially be offset by the secondary income account. Consequently, one must assume demarcation problems between trade and secondary income balances. This can hardly be argued.[13] Subtracting 98 bn Euro from the EU's 307 bn Euro trade self-surplus, at best only 209 bn EUR or 1.3 percent of the Union's GDP are statistically lost. For the Euro Area, the secondary income balance with itself shows a small surplus of 6.2 bn EUR.

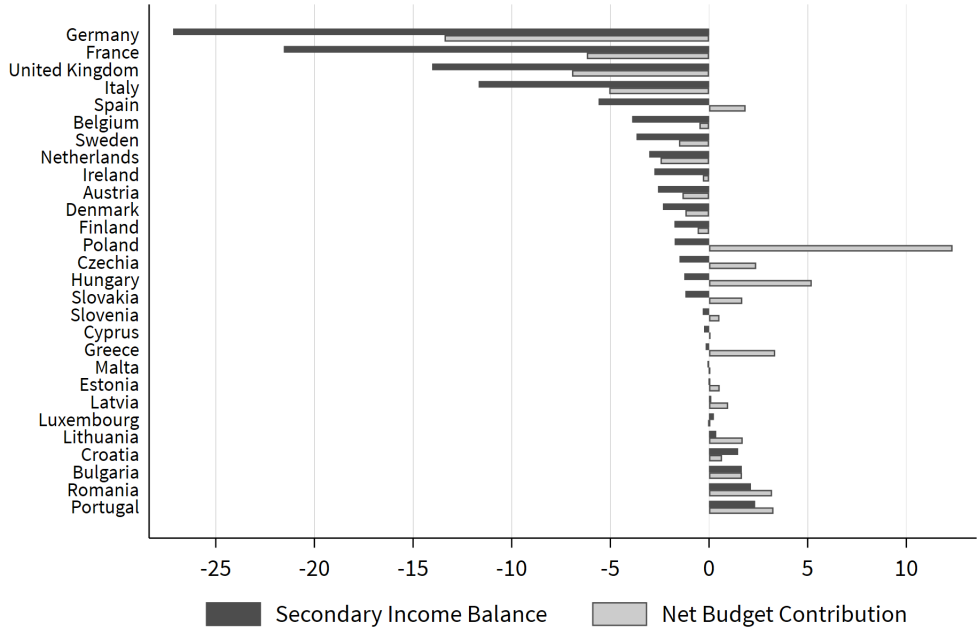
Secondary income balances for EU Member States vis-à-vis other EU Member States consist, by and large, of net contributions to the EU budget. This illustrates why demarcation problems between secondary income and trade balances seem highly unlikely. Goods and services trade accounts result from private sector transactions, net budget contributions are the consequence of inter-governmental redistribution. Thus, assuming demarcation problems between the two is neither straight-forward nor plausible.

A comparison of secondary income balances and EU budget contributions helps proving data consistency. This is shown in Figure 2.2. The following observations must not go unnoticed: first, large net contributors such as Germany, the UK, France, and Italy report negative secondary income balances twice as high as the budget contribution in absolute numbers. Second, even net recipients such as Czechia, Greece, Hungary, Poland, Slovakia, and Spain report negative secondary income balances. Third, the net contributions sum up to zero, whereas the total of the secondary income balance accounts for -98 bn Euro. Fourth, both numbers are positively correlated, the Bravais-Pearson Correlation Coefficient yields 0.8. Table 2.5 in the Appendix presents the data underlying Figure 2.2. For the sake of completeness, it also shows net personal transfers between residents and non-residents, the second core component of the secondary income account.

We can tentatively conclude the following: first, the net budget contribution and net personal transfers combined fail to sufficiently explain secondary income balances of EU Member States vis-à-vis their EU partner countries. Second, both personal transfer and budget contribution figures yield much smaller discrepancies in any direction compared to the self-deficit of the secondary income balance of 98 bn Euro. Third, the negative secondary income balances of Czechia, Greece, Hungary, Poland, and Slovakia contradict the direction of budget and personal transfers flows. Thus, even the signs of the balances remain highly ambiguous.

[13] Demarcation issues may also exist between secondary income and the capital account. Nevertheless, statistical offices in EU Member States should agree on a uniform interpretation of the BPM6.

Figure 2.2: Secondary Income Balances and EU Budget Contributions, 2018, bn EUR



Source: Eurostat, 2019, European Commission, 2019. Own illustration.

Note: The diagram shows secondary income balances of EU Member States vis-à-vis all other EU Member States. The net budget contribution is calculated as the difference between official payments to and from the EU.

2.3 Who Accounts for the EU's Self-Surplus?

The aim of this section is to shift the focus of the analysis to the country and country pair level. This is crucial in order to draw accurate policy conclusions. More specifically, we are interested in identifying country pairs that cause particularly large discrepancies. One can plausibly argue that the quality of institutions, the nature of national tax systems, and even geography should play a role in explaining discrepancies caused by fraudulent behavior, in particular by VAT evasion. Therefore, this section serves as the empirical foundation of the interpretation outlined in Section 2.4.

2.3.1 Dissecting the Discrepancies

In the following analysis, we draw on Eurostat data on bilateral trade flows (goods and services) for the year 2018 .[14] Considering all 28 EU member states, we have a maximum of 756 (28×27) observations per BoP item.[15] The Eurostat BoP data yield intra-EU goods trade exports (credit) totaling 2,874 bn Euro. This accounts for 82 percent of intra-EU exports recorded by Eurostat trade statistics (Comext).[16] It becomes apparent immediately that the coverage of EU BoP data is in need of improvement. A sensitivity analysis in Section 2.3.5 provides a more detailed comparison of BoP and foreign trade statistics data.

Our preferred measure for bilateral discrepancies takes credit and debit positions into account. The vectors X_{ij} and M_{ij} are reported by country i, the vectors X_{ji} and M_{ji} by country j.[17] In the case of perfectly matching mirror data, X_{ij} should equal M_{ji} and M_{ij} should equal X_{ji}. Let $\mathcal{E}$ denote the set of all EU Member States. Consequently, we should observe

$$\sum_{j\in\mathcal{E}}\sum_{i\in\mathcal{E}} X_{ij} = \sum_{j\in\mathcal{E}}\sum_{i\in\mathcal{E}} M_{ji}. \tag{2.1}$$

However, bilateral flows do not match perfectly in the data so that $X_{ij} \neq M_{ji}$ and $M_{ij} \neq X_{ji}$. Consequently the equality above fails to hold. We may define the discrepancy $\Delta_{\mathcal{E}}$ such that

$$\Delta_{\mathcal{E}} \equiv \sum_{j\in\mathcal{E}}\sum_{i\in\mathcal{E}} (X_{ij} - M_{ji}) = \sum_{j\in\mathcal{E}}\sum_{i\in\mathcal{E}} \Delta_{ij}, \tag{2.2}$$

where we define the absolute bilateral reporting discrepancy as $\Delta_{ij} \equiv X_{ij} - M_{ji}$. Empirically, we observe $\Delta_{\mathcal{E}} > 0$. This can be due to systematic over-reporting of X_{ij} or under-reporting of M_{ji}.[18] As we do not know the "true" size of the trade flows between i and j, we cannot distinguish between the two sources of misreporting. Both are possible. If we knew the true value, which assumptions could we make about the structure of the measurement error?

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[14] As our only data source we use Eurostat *bop_c6_q*. Due to data limitations, we cannot provide detailed sector specific results but focus on aggregate bilateral BoP items (goods trade account and services trade account) between EU Member States.

[15] After excluding missings—those trade flows for which neither party provides information—we lose 35 observations. For some additional trade flows, we miss data that are not available from both parties. Data reported by Malta and Spain are not available.

[16] Eurostat records total intra-EU trade based on export figures of 3,525 bn Euro in 2018.

[17] Both X_{ij} and M_{ji} are expressed *fob* (free on board).

[18] In principle, both can be under-reported or over-reported, but to different degrees.

Assuming errors are random and multiplicative, the number of elements in $\mathcal{E}$ growing very large, would lead to $E(\Delta_{\mathcal{E}}) \to 0$. As we will show empirically, this is not true. So, errors are in fact non-random.

In the following, we express the discrepancy in a pair in relative terms as

$$\delta_{ij} = \frac{2\Delta_{ij}}{X_{ij} + M_{ji}}. \tag{2.3}$$

For the sake of convenience, this equation is pre-multiplied with 100%. Table 2.1 shows summary statistics for the observed discrepancies in bilateral BoP data for the year of 2018. Figure 2.5 in the Appendix illustrates these distributions graphically. Positive means and medians confirm what we know from aggregate data: the presence of a credit/export bias. For goods trade, 50 percent of the flows are outside a discrepancy range between -10 to 18 percent around the mean values. For services trade, the same is true for a range between -18 and 46 percent. The standard deviation is roughly the same in both distributions.

Table 2.1: Summary Statistics: Bilateral Discrepancies, 2018, in %

	Min	P-25	Median	Mean	P-75	Max	SD
Goods Trade	-195.1	-10.2	5.4	2.3	17.5	206.7	49.4
Services Trade	-200.0	-18.0	11.0	12.7	43.1	200.0	54.8

Source: Eurostat, 2019. Own calculations.
Note: The table shows summary statistics for the distribution of discrepancies as defined in Equation 2.3.

2.3.2 Country Analysis

In the following, we discuss which countries appear to have the largest reporting biases. The identification of Member States who play a major role in causing the observed discrepancies is of great interest. Due to the dyadic dimension of the problem, a definite identification is difficult to achieve. As an approximation to this problem, we calculate average country level discrepancies:

$$\delta_i = \frac{1}{n}\sum\nolimits_{j\in\mathcal{E}} \delta_{ij} \quad \text{and} \quad \delta_j = \frac{1}{n}\sum\nolimits_{j\in\mathcal{E}} \delta_{ij}, \tag{2.4}$$

where δ_i denotes the mean discrepancy for country i being the exporter, δ_j denotes the mean discrepancy for country j being the importer, and n measures the number of trade

partners (i.e., the cardinality of the set $\mathcal{E}$). Table 2.2 shows mean discrepancies per country based on Equation 2.4 for goods and services separately.

Table 2.2: Mean Discrepancies per Country, 2018, in %

Country	Goods Credit	Services Credit	Goods Debit	Services Debit
Austria	16.7	33.1	3.3	24.4
Belgium	-15.8	27.4	-12.8	9.6
Bulgaria	28.6	-34.0	15.4	-39.0
Croatia	25.9	11.6	5.3	-42.7
Cyprus	-61.9	-79.9	-37.5	-73.3
Czechia	-2.9	-4.2	-14.8	-28.4
Denmark	6.4	48.9	3.2	11.5
Estonia	7.6	48.7	-21.2	46.1
Finland	12.4	33.1	-7.5	6.0
France	-3.3	2.3	-3.6	9.4
Germany	9.9	-7.1	11.9	-17.7
Greece	28.3	44.1	32.6	-2.2
Hungary	7.0	24.8	11.3	2.5
Ireland	-20.0	-13.1	-9.2	-62.0
Italy	4.7	4.0	-1.1	3.5
Latvia	10.2	10.5	9.7	-39.2
Lithuania	12.4	23.3	10.1	-3.1
Luxembourg	41.2	63.3	2.1	7.7
Netherlands	0.3	-0.8	-3.1	-32.4
Poland	14.2	26.2	4.6	5.7
Portugal	23.1	34.4	5.9	-10.9
Romania	13.6	24.2	15.6	3.5
Slovakia	10.1	10.0	5.1	-11.0
Slovenia	23.5	53.8	23.8	8.2
Sweden	-65.3	-2.6	-55.5	-22.4
United Kingdom	-8.1	-17.4	-8.5	-62.4

Source: Eurostat, 2019. Own calculations.
Note: Column 1 and 2 show the average discrepancy in bilateral trade for the respective country being an exporter. Column 3 and 4 show the average discrepancy in bilateral trade for the respective country being an importer. Discrepancies are defined as in Equation 2.4. All values refer only to BoP positions vis-à-vis EU Member States. No data is available for Malta and Spain.

As either party of a given transaction can be the source of misreporting, figures provided in Table 2.2 need to be interpreted cautiously. For instance, Bulgaria shows an export over-reporting bias of 29 percent on average, one of the highest observed. This bias can either be caused by 'false' reporting of exports by Bulgaria, or 'false' reporting of imports by all other countries (or, most likely, a combination of the two). Assuming all countries

but Bulgaria misreport their imports, the Romanian export bias, for instance, should resemble the Bulgarian figure. In fact, it is only about half of it. The same holds true for all other individual countries. That is due to the fact that the marginal effect of one additional country pair discrepancy could change the overall country mean discrepancy only very little. Thus, the observed variation in mean export discrepancies across EU Member States is a simple and qualified indicator for country specific reporting biases.

Member States with the largest export biases (in percent) are Luxembourg (41), Bulgaria (29), and Greece (28). Germany, Europe's largest exporter, reports on average 10 percent more goods exports. The Netherlands (0.3), Czechia (-3), and France (-3.3) are those Member States with the lowest discrepancies in their goods exports. Sweden (-65), Cyprus (-62), and Ireland (-20) display a server tendency towards a substantial under-reporting of their exports. The average absolute discrepancy is 18 percent.

Discrepancies in services accounts are on average larger than in goods accounts: the average absolute discrepancy is 26 percent. Over-reporting goods exports goes along with over-reporting services exports. The two figures are significantly positively correlated ($corr = 0.62$). The most accurate reporting is performed by France (2.3) and, again, by the Netherlands (-0.8), the largest inaccuracies are observed for Cyprus (-80) and Luxembourg (63).

Table 2.2 demonstrates that smaller EU Member States are more likely to exhibit larger discrepancies. Indeed, absolute values of discrepancies decrease in mean trade volume: a doubling of trade volume (defined as the average of one exporter's credit and the importer's debit positions) lowers absolute discrepancies by 4.9 (goods) and 3.7 (services) percentage points. This does not come as a surprise: scale economies might also apply to statistical recording, and statistical offices might allocate resources to prioritize tackling larger trade partners. Scatter plots showing the relationship between trade volume and discrepancy are found in the Appendix (Figure 2.6 and 2.7). Also, the correlation pattern of debit and credit positions is informative: credit and debit positions are highly positively correlated ($corr = 0.85$ for goods, and $corr = 0.80$ for services). This means that countries with inflated credit accounts, also tend to over-report their debit positions. This is particularly important for interpreting discrepancies as evidence for VAT fraud, as inflated BoP accounts could be an indicator for carousel-type trade. For this purpose, however, a country pair analysis is more insightful.

2.3.3 Cross-Country Correlations

If VAT fraud is at the bottom of the self-surplus of the EU, one would expect measured VAT compliance, institutional quality or the size of the shadow economy to correlate with the mean import and export discrepancies reported above.

Figure 2.3 correlates our measure for country discrepancies with VAT compliance gaps estimated by Morrow et al. (2019). We observe significantly positive correlations for goods discrepancies and VAT compliance gaps but zero correlation for services. This could be an indication that goods trade discrepancies are more severely affected by VAT fraud. The correlation shows that countries with higher VAT compliance gaps tend to feature both over-reported import and export figures.

Figure 2.3: Mean Discrepancy per Country and VAT Compliance Gaps

Source: Eurostat, 2019. Morrow et al. (2019). Own calculations.

Note: The figure plots the VAT compliance gaps versus absolute discrepancies as defined in Equation 2.4 (2018 values). Fitted values according to OLS.

We do not detect a statistically significant correlation between average country discrepancies and a measure for institutional quality.[19] Thus, it appears that, in our sample,

[19] As a measure of institutional quality, we use the World Governance Index of the World Bank and aggregate the six sub-indexes into one combined index; see Figure 2.9 in the Appendix.

governments' ability (or willingness) to provide correct BoP data is not a function of institutional quality. We also do not find a significant correlation between average discrepancies and the relative importance of the shadow economy reported by (Medina and Schneider, 2018).[20]

Note, however, that the insights from such a cross-country analysis based on 26 observations are necessarily limited.[21] Since we are interested in international trade, the nature of the problem is inevitably bilateral. In other words: the extent of VAT fraud does not solely depend on either the exporter or the importer, but on their (potentially complex) interaction. As a next step, it is therefore crucial to conduct a bilateral country pair analysis.

2.3.4 Country Pair Analysis

This sub-section explores which country pairs are particularly prone to bilateral discrepancies. Additionally, we investigate whether neighboring countries display notably higher discrepancies—another finding that would support our hypothesis that VAT fraud plays a role in solving the self-surplus puzzle. We begin by defining the mean country pair discrepancy as

$$\delta_{ij} = \frac{1}{2}\Big(|\delta_{ij}|+|\delta_{ji}|\Big), \tag{2.5}$$

which is a symmetric measure in the sense that $\delta_{ij} = \delta_{ji}$. Hence, we base our analysis on 378 unique country pairs.[22] We average absolute values of flow discrepancies since positive and negative discrepancies could otherwise net out. Country pair discrepancies of goods and services trade are significantly correlated, the correlation coefficient is 0.28. Table 2.3 shows summary statistics of the distribution of country pair discrepancies.

Table 2.3: Summary Statistics: Country Pair Discrepancies, 2018

	Min	P-25	Median	Mean	P-75	Max	SD
Goods Trade	0.0	3.2	14.5	32.3	34.6	204.6	43.7
Services trade	0.0	12.8	30.5	40.4	55.3	200.0	37.8

Source: Eurostat, 2019. Own calculations.
Note: The table shows summary statistics for the distribution of country pair discrepancies as defined in Equation 2.5.

[20] See Figure 2.8 in the Appendix.

[21] 28 EU Member States minus Malta and Spain, for which no data are available.

[22] Considering all 28 EU Member States, the number of pairs is given by $28 \times 27/2$.

Amongst the 25 country pairs show the highest pair discrepancies in goods trade, Sweden and Cyprus are listed 12 and 9 times, respectively.[23] In the services account, Cyprus is part of 11 country pairs. The country pair UK–Luxembourg is particularly striking: according to British data, the service trade volume amounts to 8.2 bn Euro; the same figure, as reported by Luxembourg, stands more than three times as large at 27.3 bn Euro. The corresponding discrepancy totals 108 percent of the mean trade volume. Also, the UK's service trade with Denmark worth 11.5 bn Euro (on average), shows a discrepancy of 91 percent. The trade volume of these two country pair relationships is higher than the combined trade of the other 23 country pairs with exceptionally low reporting quality.

We conclude the descriptive part of this chapter with a brief regression analysis that presents insightful correlations. We regress our measure for country pair discrepancies on the mean bilateral trade volume. Moreover, we include data provided by the CEPII that are typically used for gravity estimations. Our regressions take the following form:

$$\delta_{ij} = \beta_0 + \beta_1 log(V_{ij}) + \boldsymbol{X_{ij}\mu} + \nu_i + \epsilon_{ij}, \tag{2.6}$$

where V_{ij} denotes the mean trade volume for country pair ij. The vector $\mathbf{X}$ includes several country pair specific control variables: geographic distance, the presence of a common border, common language, shared history as well as differentials in VAT standard rates.[24] ν_i denotes country fixed effects taking the value one when country i is part of a given country pair.

Table 2.4 shows the regression results. Generally, the model fit is substantially higher for goods than for services trade. As already stressed above, discrepancies decrease in trade volume; this effect remains is robust across all specifications (except for the most demanding regression on services discrepancies). The regression suggests that trade volume explains almost one fifth of the discrepancies for goods. As for services, the share of explained variance is only 11 percent. Possibly, when the volume of trade between two countries is greater, statistics are more carefully compiled.

Conditional on trade, mean discrepancies for both goods and services increase in distance; however, these effects disappear when including country fixed effects. A common border increases bilateral discrepancies by about 12 percentage points for trade in goods, a striking and robust result. We take this as indication for VAT fraud that occurs due to cross-border back and forth transactions. This effect is not present for services. Common

[23] Cf. Table 2.6 and Table 2.7 in the Appendix for full details.

[24] Common history means in the case for European countries whether a country pair in the past formed a common state. For example, Croatia and Slovenia both formerly belonged to Yugoslavia. One would expect that quality of statistical recording is better in the presence of shared institutional history.

Table 2.4: Regression Analysis: Country Pair Discrepancies; 2018 Cross-Section

	Goods			Services		
	(1)	(2)	(3)	(4)	(5)	(6)
log Trade	-7.05***	-5.59***	-14.79***	-5.83***	-4.55***	-8.19
	(0.94)	(1.00)	(4.67)	(1.31)	(1.37)	(4.98)
log Distance		14.63***	-5.83		14.55***	-3.05
		(4.28)	(7.49)		(4.75)	(8.03)
Common Border		11.64***	12.98**		4.81	1.48
		(4.43)	(5.05)		(6.71)	(6.74)
Common History		2.69	1.24		11.07	9.49
		(5.47)	(5.59)		(7.54)	(8.36)
Common Language		15.39**	-3.06		11.38	5.74
		(6.52)	(8.08)		(12.19)	(8.92)
Δ VAT Rate		3.16***	0.41		0.92	-0.00
		(1.20)	(1.19)		(0.91)	(1.15)
Observations	248	248	248	237	237	237
R^2	0.18	0.25	0.59	0.11	0.16	0.44
Country FE			✔			✔

Source: CEPII, 2019. Eurostat, 2019. Own calculations.
Note: Ordinary Least Square Regressions with heteroskedasticity robust standard errors. Dependent variables are country pair discrepancies as defined by Equation 2.5. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

history does not seem to have a direct impact on discrepancies. A common official language is associated with 15 percentage points increase in discrepancies. Including fixed effects, the effect vanishes.

Most importantly, differentials in VAT standard rates lead to higher discrepancies: a one percentage point increase in VAT rate differentials goes along with a 3 percentage points increase in discrepancies.[25] This is in line with our hypothesis: the higher the differences in tax rates between two countries, the greater the incentives for tax fraud. Again, with fixed effects, the effect turns insignificant. This is not overly surprising since the VAT-gap is constructed as the difference of country-i's and country-j's tax rate which is collinear to the inclusion of fixed effects.

Country fixed effects explain 28 to 34 percent of the total variance. Table 2.8 shows all ν_i coefficients; they can be interpreted as mean discrepancy in percentage points. These

[25] The standard VAT rates in the EU range between 17% (Luxembourg) and 27% (Hungary).

fixed effects constitute an alternative measure for quality of national data recording. Column 3 repeats this exercise with a different data source (cf. Section 2.3.5).

2.3.5 Sensitivity Analysis

Next, we perform a sensitivity analysis based on an alternative data base. To this end, we use 2018 trade data from the Comext database, "Eurostat's reference database for detailed statistics on international trade in goods".[26] A comparison with services trade figures from another data source would be ideal. However, Eurostat only provides services trade data based on its Balance of Payments data, which obviously makes a comparison obsolete.

According to Comext, the EU (Euro Area) runs a self-surplus amounting to 64 (19) bn Euro in 2018. These numbers are significantly lower than those resulting from the reported Balance of Payments data. In contrast to Balance of Payments data, the foreign trade statistics (FTS) applies a different valuation method for imports and exports: imports reflect transaction values at the border of the importing economy including *cost, insurance, freight (cif)*; exports are recorded according to transaction values at the border of the exporting economy *free on board (fob)*. Thus, a bias towards higher import than export values is systemically inherent to the FTS data, while BoP statistics only comprise *fob* recorded data. Logically, one would expect zero bilateral discrepancies in BoP data and systematic import surpluses in FTS data due to *cif-fob* differentials. Both is evidently not the case, and a sizable export-bias is prevalent even in European FTS. This provides additional evidence for a systematic pattern of over-reported exports within the EU.[27]

Aside from these differences in absolute numbers, Comext data strongly support our previous findings in qualitative terms. These data display a very similar distribution of discrepancies, they allow replicating the pattern of average country discrepancies that we find in Section 2.2 and the same negative relationship between trade volume and discrepancies.[28] Again, Cyprus, Ireland and the UK show strong under-reporting biases. Malta, whose BoP data is not available, seems to have the most inaccurate data. For Luxembourg—at odds with the previously detected strong export-bias—a severe import-

[26] For more information see ec.europa.eu/eurostat/web/international-trade-in-goods/data/focus-on-comext.

[27] Cf. Dimitrov (2004), a Eurostat publication, for more details on methodological differences between BoP and FTS.

[28] See Figures 2.10 and 2.11 as well as Table 2.9 in the Appendix.

bias becomes visible. Germany, Europe's largest trading economy shows the lowest discrepancies.

Interestingly, signs of import and export reporting biases are again strongly positively correlated ($corr = 0.91$). The country pair analysis yields similar results as shown above:[29] amongst the 25 country pairs with the most inaccurate data, Cyprus appears six times; Malta even 11 times. Our regression results can largely be replicated.[30] The effects of trade volume and other covariates on the observed discrepancies are strikingly similar to our previous findings, both in terms of magnitude and significance of coefficients. We again measure a strong border effect that drives discrepancies. This finding suggests, as we explore more explicitly below, that neighboring countries are particularly prone to cross-border VAT fraud.[31]

All our findings remain absolutely robust when choosing 2017 as a reference year.[32] This is true both for BoP as well as Comext data. Hence, we are confident that the discrepancies shown above result from a systematic pattern that we discuss next. We have provided evidence that identifies country level and country pair level patterns in intra-EU Balance of Payments discrepancies for goods and services trade. In many cases these discrepancies are disproportionately large and seem to follow recurring patterns. Based on the evidence gathered so far, the next section attempts to unravel the EU's self-surplus puzzle.

2.4 Making Sense of the Self-Surplus Puzzle

Our findings from Section 2.2 and Section 2.3 highlight that current account data, even within the EU and the Euro Area suffer from very substantial inconsistencies. Recently, the British magazine The Economist postulated that *"Rich countries' trade statistics tend to be more reliable than those of emerging economies, where data collection is less developed"*.[33] In light of our analysis, one can question this assertion.[34] Inconsistent data make solid evidence-based economic policy advice very difficult. What is more, it could reflect a much deeper problem: fraud. Since we apply forensic accounting methods,

[29] See Table 2.10 in the Appendix.

[30] See Table 2.11 in the Appendix.

[31] Table 2.8 in the Appendix performs simple fixed effect regressions on country pair discrepancies. Magnitude and significance of the reported coefficients in Column 3 differ only very little from those in Column 1; qualitatively, they support our findings based on EU BoP data.

[32] For the sake of brevity and in order to avoid duplication, we do not discuss these results.

[33] The Economist, November 12, 2011, accessed on December 20, 2018.

[34] We do not present any comparison between EU BoP data and that of emerging economies, though.

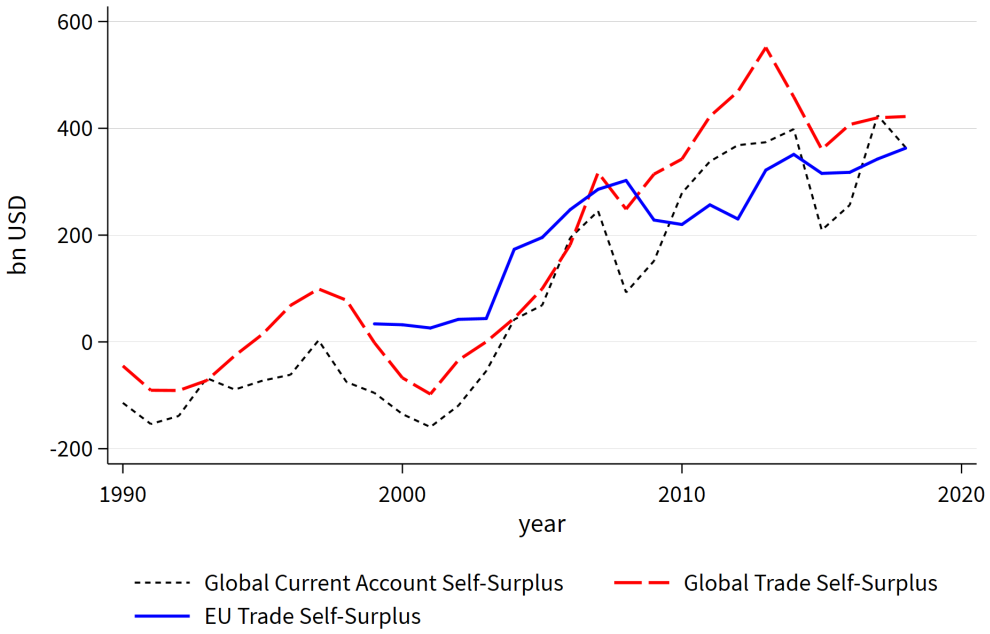
nota bene, we can neither claim completeness nor ultimate truths but we try to collect evidence for and against our claim.

As mentioned before, not just the EU but the entire world runs a substantial trade self-surplus. This discrepancy amounts to 422 bn USD, which equals 0.5 percent of global output (or, equivalently, about 1.7 percent of world exports) in 2018, and is only slightly higher than the EU's total trade self-surplus of 363 bn USD (307 bn EUR). Hence, it appears that the EU self-surplus accounts for 86 percent of the global surplus. Figure 2.4 tracks the evolution of the global trade self-surplus, the EU's trade self-surplus as well as the global current account discrepancy, which consists by and large of global trade surpluses. The diagram shows that the global trade self-surplus was negative before 2004 and has increased since then, mostly in lockstep with the EU's own self-surplus. Thus, the global surplus seems not to be due to interstellar trade (Krugman, 2010). At least to a large extent, it is, in fact, made in the EU.

Strikingly, the global trade deficit started growing in 1993 and turned into a surplus in the late 90s. During the preceding decades, it always has been a global deficit. The year 1993 is also the starting date of the EU Single Market, which has facilitated intra-European trade substantially (Felbermayr et al., 2018). In 2004, the EU Eastern enlargement has created the world's second largest internal market. Unfortunately, comprehensive data series that would allow calculating the EU self-surplus back to 1993 are rarely available. Between 1999 and 2003, the EU self-surplus has remained very stable. Later, coinciding with the EU Eastern enlargement, it has quadrupled. Arguably, the creation of the Single Market and ancillary achievements such as the Schengen Agreement or the creation of the Euro Area may have fostered VAT fraud. Indeed, in its Foreign Trade Statistics (FTS), Eurostat has been reporting a self-surplus of the EU since 1993. This is at odds with the previously discussed import-bias in FTS due to *cif-fob* differentials.

In the following, we firstly discuss alternative interpretations of discrepancies in goods trade. Second, we move to services accounts. Finally, we estimate the expected fiscal loss due to VAT fraud and outline a brief concept to improve data recording in cross-border trade.

Figure 2.4: The EU Self-Surplus in the global context, bn USD



Source: IMF, 2019. World Bank, 2019. Eurostat, 2019. Own calculations.

Note: Comprehensive EU data before 1999 are not available. The global current account and trade self-surpluses refer to the sum over all current account and trade balances, respectively. Global figures might include missing values.

2.4.1 Explaining the Self-Surplus in Goods Trade

We have shown that the EU self-surplus in goods trade exhibits a systematic, non-random over-reporting bias. Section 2.3 presents evidence for a high degree of variation in the quality of statistical recording across EU Member States and country pairs.

It is well known, that EU trade statistics are distorted due to the so-called Rotterdam Effect. Overseas imports entering the EU in Rotterdam and transiting to other Member States are often recorded as Dutch exports and likewise as an intra-EU import by the counterparty. This leads to inflated trade statistics with respect to the Netherlands. Discrepancies arise, however, when these overseas imports are recorded differently by the Netherlands and the country of final destination.[35] Interestingly, we do not find evidence that the Rotterdam Effect causes discrepancies in intra-EU trade statistics:

[35] Appendix 3 in the Balance of Payments Manual 6 focuses on special issues for customs unions, economic unions and currency unions. Box A3.I is insightful for the correct recording of transactions between members of such unions, to avoid double counting or artificially inflated trade statistics of economies of consignment.

Dutch accounts on goods trade, both credit and debit, are the most accurate among all EU Member States (0.3 and -3.1 percent, respectively).

An argument made by Frankel (1978) is that current account discrepancies arise when firms try to circumvent capital controls. For intra-EU discrepancies, we can largely rule out this channel, since capital controls within the EU are rare events.[36]

One may suspect that transfer pricing has a distorting effect on intra-EU current account statistics. Even if manipulated transfer prices are used to shift corporate profits, under-priced/ over-priced transactions would not materialize in bilateral discrepancies since accurate BoP figures require correct double-entry bookkeeping, independent of artificially inflated or deflated gross values. Thus, a national trade balance would be distorted by such measures, but discrepancies in trade statistics are not a consequence thereof.

We believe that value-added tax fraud provides a more convincing explanation for BoP discrepancies. Participants of the Single Market exempt exports from value-added tax. Effectively, VAT is borne by domestic sales independent of their origin. When products enter a foreign EU Member State, VAT is levied in the destination country. That is due to the fact that consumption instead of production is the objective of taxation. Subsequently, the European VAT system is considered a growth-friendly tax, but it is apparently prone to fraud: if firms can legally declare products as exports which are in fact not exported (or re-imported), they can sell them domestically without remitting VAT to the respecitve government. The only and most directly concerned beneficiaries of over-stated exports are firms.[37]

Therefore, the European VAT system is evidently prone to tax fraud. To curb such practices, the EU Commission initiated an VAT Action Plan in 2016.[38] Assessing the damage for European tax payers, the EU Commission has estimated that a single fraud type—the so-called "missing trader"—causes annual VAT revenue shortfalls of 45 to 53 bn Euro (Fearing et al., 2015).[39]

Fedeli and Forte (2009) describe technical details of VAT fraud systems. In a nutshell, the "missing trader" practice functions as follows: A trader (Firm 2) located, for example,

[36] Greece has temporarily introduced capital controls in summer 2015. Cyprus has introduced capital controls between 2013 and 2015. For 2018, the reference time of our analysis, no capital controls in the EU were effective.

[37] Statistical offices, of course, could technically also manipulate data. However, it is questionable why statistical offices should follow such objectives and what there incentives to do so would be.

[38] See http://europa.eu/rapid/press-release_IP-18-3834_en.htm, accessed on December 20, 2018.

[39] Please note that these numbers stem from an indirect source. The cited paper is a report for the EU Commission performed by Ernst & Young. It references an EU Commission VAT gap report, which has originally estimated the cited numbers on VAT revenue shortfalls. The original source was not traceable.

in, France purchases a product from Firm 1 located, for example, in Germany. This cross-border transaction is VAT-exempt. Firm 2 resells the product to a French exporter (Firm 3). For this transaction, VAT is due and must be remitted by Firm 2 to French tax authorities. Due to input tax deduction, Firm 3 reclaims the VAT payment it has made to Firm 2. Firm 3 sells the good across the border back to Firm 1 in Germany. The last transaction is again free of tax. Firm 2 does not remit the VAT, which has been rebated to Firm 3, to French tax authorities. Thereby, French tax payers have rebated VAT to Firm 3 that has never been collected. Firm 2 then "disappears"; such firms are often mailbox entities and, therefore, commonly known as "missing trader". Experts have named this fraud system "carousel".

Export and re-import should not distort trade figures but cancel out on net. However, this type of VAT fraud does involve higher than expected cross-border trade activities, potentially cumulating measurement errors. Physical shipment of goods is costly. Therefore, the expected (private) gains from fraud are highest when trade costs are minimized. Our regression results, illustrated in Table 2.4 and 2.11 (Column 2 and 3), suggest that neighboring countries have substantially higher discrepancies. Arguably, nearby countries with a common border should define the transaction cost minimum. This is suggestive evidence in favor of cross-border VAT fraud between neighboring countries. The fact that the same pattern is not observed in service discrepancies supports this claim. The structure of transaction costs for services, e.g., financial or business-to-business services, depends much less on distances and borders.

2.4.2 Explaining the Self-Surplus in Services Trade

For historical reasons, statistical regimes in the EU differ by Member State. For various reasons, data quality for goods trade is better than for services trade. First, due to the formerly lower economic importance of cross-border service trade, efforts have primarily focused on establishing international standardization for the recording of goods trade. Second, because services are exempt from tariffs, governments draw revenue only from the imports of goods. Hence, governments have always had an interest in achieving a high quality statistical recording of international goods trade.

Similar to discrepancies in services trade between the EU and the US (Braml and Felbermayr, 2019), the United Kingdom contributes quite substantially to discrepancies in intra-EU services trade: the total EU self-surplus in services amounts to 141 bn Euro. Within the Euro Area, this figure stands by 39 bn Euro only. The British Office for National Statistics (ONS) generates trade statistics by conducting survey-based partial

censuses and national projections, which evidently lead to high discrepancies (Chesson et al., 2018).

However, high average discrepancies for countries with certain relevance for financial services indicate that this sector is particularly prone to statistical mis-recording. Table 2.2 (Column 2 and 4) illustrates this matter for Cyprus, Ireland, Luxembourg, the Netherlands (only Debits) and the United Kingdom. It stands out that these countries display discrepancies for credit and debit accounts that point in the same direction (Cyprus, Ireland, the UK and the Netherlands exhibit under-reported figures, Luxembourg over-reported figures). Service exports and primary income payments are, to a growing extent, substitutable and can distort BoP sub-accounts. A joint evaluation would be necessary for a final assessment. Due to data limitations, such an undertaking is not possible yet.

Figure 2.1 shows that the EU's mysterious self-surplus in services has increased five-fold since 2010. This sharp increase can hardly be explained by time-invariant general recording problems. We therefore suspect another trend to drive this increase: dis-intermediation and e-commerce. Services exports used to be mainly business-to-business transactions. Nowadays, consumers can purchase from foreign companies directly and the intermediator—often a domestic importer—is becoming increasingly obsolete. This is particularly true for cloud, streaming, and software services. When trade mainly consists of high-value business-to-business transactions, no systematic credit-bias occurs; but when trade increasingly entails more business-to-consumer transactions, a credit-bias becomes prevalent: the exporter records the cross-border transaction while the importer—the final consumer—does not. When low-value transactions are performed on a high scale, statistics systematically under-report true import figures. This is a direct effect of so-called de-minimis thresholds.[40] Thus, the combination of e-commerce and dis-intermediation is a growing challenge for statisticians especially in the correct recording of services transactions.

At the same time, e-commerce has also become a platform for criminals who have set up digital VAT carousel schemes. In principle, the mechanism for VAT fraud in e-commerce functions in an analogous manner as in traditional goods trade: exports are VAT-exempt. Declaring services as exports which are in fact not exported therefore materializes in non-remitted value added tax. Borselli et al. (2015) describe a case disclosed in Italy, where two large telecommunication providers became unknowingly part of a cross-border VAT fraud scheme that cost Italian taxpayers 365 mn Euro. This provides evidence that cross-

[40] E.g., according to the German foreign trade legislation every transaction worth more than 12.500 Euro must be reported to the Bundesbank, who is in charge of compiling German services trade statistics. As a consequence, all payments below this threshold remain undocumented.

border VAT fraud is not only limited to goods trade. On the contrary, it might be even more profitable in services trade due to lower transactions costs.

In the EU, statistical recording is hampered by a fundamental lack of harmonization. This is particularly true for the collection of cross-border services trade data. The existence of 28 different regimes in the EU not only causes statistical discrepancies; the poor data situation also makes it easier for fraudulent parties to hide their illegal activities. To avoid unlawful practices with respect to services trade, some EU Member States, e.g., Germany have partially changed their systems of VAT collection. In contrast to the general principle, according to which the provider of a service is obliged to remit VAT, a reverse charging has been implemented.[41] Basically, it levies the duty to remit VAT to the services recipient, e.g., the final consumer. In order to fight tax fraud, Borselli et al. (2015) also recommend reforms towards a system of reverse charging.

2.4.3 Potential VAT Revenue Shortfalls

In the following, we quantify VAT revenue shortfalls for the EU. Thereby, we assume that VAT fraud is the only reason for the observed credit-bias in intra-EU BoP accounts. Given this relatively strict assumption, our estimates should be interpreted as an upper bound of the actual fiscal loss. Note, however, that there may be VAT fraud that is not detectable in international trade statistic. Hence, our estimates may even underestimate cross-border VAT fraud.

Let X_{ij} be the sum of services and goods exports of country i to country j, and let M_{ji} be the imports of country j from i, where i and j are both members of the EU. Let the average VAT rate in country j be $\bar{t}_j$. If the entire data discrepancy were due to VAT fraud, the fiscal loss to the government in country j would amount to

$$T_j = \bar{t}_j \sum\nolimits_i (X_{ij} - M_{ji}) \tag{2.7}$$

for all pairs ij where $X_{ij} > M_{ji}$. For the EU as a whole, the aggregate loss yields

$$T = \sum\nolimits_j \sum\nolimits_i \bar{t}_j (X_{ij} - M_{ji}) . \tag{2.8}$$

Our data do not allow calculating T_j from Equation 2.7, because $\sum_i (X_{ij} - M_{ji}) > 0$ is only satisfied for 18 EU Member States. However, for all Member States, we know aggregate balances vis-à-vis the EU as a whole (see Section 2.2.3). Let $\bar{t}$ be the GDP

[41] German VAT Legislation, accessed on December 20, 2018.

weighted average EU VAT rate[42], the EU-wide VAT loss can be approximated by

$$T = \bar{t}\left(\sum_j \sum_i (X_{ij} - M_{ji})\right). \tag{2.9}$$

Since $\sum_j \sum_i (X_{ij} - M_{ji}) = 307$ bn Euro in 2018, with $\bar{t} = 0.21$, we arrive at about 64.5 bn Euro of taxes forfeited. As the UK's contribution to the discrepancies is most likely resulting from measurement error, not the full amount of 307 bn Euro is due to VAT fraud. But even within the Euro Area, the discrepancy of 126 bn Euro implies an amount of fraud equal to 26.5 bn Euro; more than 70 Euro per capita. Put differently, if we assume that VAT fraud affects trade in goods only, the fiscal loss amounts to 34.9 bn Euro. From 2006 to 2018, the cumulative self-surplus for goods of the entire EU amounts to 2,047 bn Euro. Assuming an average VAT rate of only 18 percent for the entire period[43], EU budgets could have fallen short of 370 bn Euro over the past 13 years.

2.4.4 Implementing an Electronic Clearing Procedure

Trade data appear massively distorted by inaccurate measurement and fraudulent misreporting. We believe in technical solutions to tackle both. An outline of such a solution could look as follows: the implementation of an electronic clearing procedure, that documents all cross-border transactions for goods and services. Every transaction should require a two-factor authentication: first, the exporter records export value, quantity, and counterparty in the system. Second, the importer confirms transaction details. The data collected would be automatically transmitted to statistical offices and tax authorities. The reverse VAT charging, that usually applies to intra-community supply, should apply here as well. As long as the importer does not confirm the transaction, VAT liability is with the exporter. In the moment of confirmation, tax liability passes over to the importer. In this system, to avoid having to remit VAT, the exporter would urge the importer to confirm the transaction. In any case, at least one party would remit VAT. Thus, potential fraud (wrong declaration or confirmation by any of the two parties) cannot lead to non-taxation. This system is also applicable for business-to-consumers services transactions: every EU citizen could have an electronic VAT ID to pay taxes for, e.g., imported streaming services. Payments could be processed automatically by an electronic VAT App. An additional advantage of this procedure is that de-minimis thresholds would become obsolete.

[42] Source: Eurostat 2019. Using an average VAT rate can easily lead to an underestimation as the incentive for fraud increases in the VAT rate.

[43] VAT rates have slightly increased over time.

2.5 Concluding Remarks

This chapter reports and analyzes large inconsistencies in intra-European balance of payments data. The mere size of the mysterious EU trade surplus with itself—307 bn Euro, or 1.9 percent of the Union's GDP—is truly remarkable. This EU trade self-surplus is persistent over time. Recently, the correct recording of services trade has become an additional challenge for statisticians. The EU's secondary income account with itself not only shows high discrepancies but also contradicts estimates derived by the sum of EU budget contributions and personal transfer payments.

This chapter introduces a simple measure for discrepancies on the country and country pair level. Our analysis finds large heterogeneity in data accuracy across countries indicating substantial differences in governmental practices of statistical recording. According to our estimations, Cyprus, Ireland, Luxembourg, and Sweden are the EU Member States with the most inaccurate statistical regime. The Netherlands provide the most accurate data for goods trade. Accounting for economic size, British figures seem to distort intra-EU current account data most significantly. The self-surpluses for goods and services trade have increased over time and give reason to suspect that statistical regimes in the EU are systematically incapable of tracking true import and export figures.

The EU self-surplus makes up 86 percent to the global trade self-surplus of 422 bn USD in 2018. After the EU Eastern Enlargement in 2004, reported discrepancies have quadrupled. The trade self-surplus of the Euro Area accounts for only 41 percent of the EU self-surplus. Somewhat ironically, in the event of a Brexit, average data quality in the EU would improve, and the EU would account for less than 40 percent of the global self-surplus. Needless to say, the withdrawal of the UK from the EU will have substantial effects not only on the bilateral trade relationship but also on recorded data.

Applying forensic accounting methods, we find suggestive evidence that VAT fraud drives discrepancies, in particular for neighboring countries and countries with differentials in applied VAT rates. Attributing the observed discrepancies to VAT fraud, we can quantify EU-wide VAT revenue shortfalls from 27 to 35 bn Euro per year in a realistic scenario. At worst, revenue shortfalls would amount to 64 bn Euro. Finally, we link the growing importance of e-commerce and the process of dis-intermediation to rapidly growing discrepancies in services trade. For the sake of fighting tax fraud, but also to enable policy relevant research based on reliable data, we call on the institutions in charge to substantially improve quality and reliability of intra-EU BoP data. Therefore, we have outlined an electronic clearing procedure that has great potential to inhibit tax fraud

and misreporting. Also, the non-disclosure or non-collection of certain BoP items (e.g. primary income) need to be tackled urgently.

Appendix Chapter 2

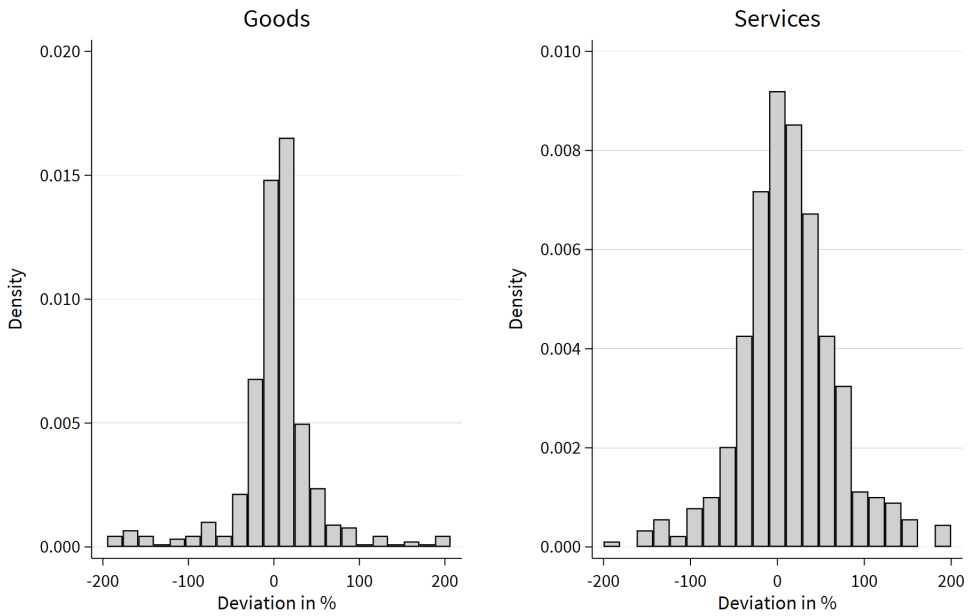
Table 2.5: Secondary Income Accounts by Components, 2018, bn EUR

Country	Secondary Income Balance	Net Budget Contribution	Net Personal Transfers	Sum Column (3) + (4)
Austria	-2.59	-1.35	-0.38	-1.72
Belgium	-3.89	-0.49	-0.14	-0.63
Bulgaria	1.65	1.67	0.83	2.50
Croatia	1.47	0.66	0.74	1.40
Cyprus	-0.25	0.08	-0.13	-0.05
Czechia	-1.50	2.39	-0.03	2.36
Denmark	-2.34	-1.20	.	-1.20
Estonia	0.04	0.54	0.05	0.59
Finland	-1.75	-0.58	-0.11	-0.69
France	-21.55	-6.19	-2.33	-8.53
Germany	-27.16	-13.41	-2.47	-15.88
Greece	-0.17	3.35	-0.06	3.29
Hungary	-1.26	5.21	0.30	5.51
Ireland	-2.77	-0.31	-0.62	-0.93
Italy	-11.67	-5.06	-0.29	-5.35
Latvia	0.11	0.97	0.06	1.03
Lithuania	0.36	1.71	0.37	2.08
Luxembourg	0.24	0.02	-0.09	-0.07
Malta	-0.07	0.05	-0.06	-0.01
Netherlands	-3.03	-2.46	-0.04	-2.50
Poland	-1.75	12.34	2.44	14.78
Portugal	2.33	3.27	.	3.27
Romania	2.12	3.19	2.49	5.68
Slovakia	-1.20	1.68	0.05	1.73
Slovenia	-0.32	0.53	0.02	0.55
Spain	-5.59	1.86	.	1.86
Sweden	-3.67	-1.52	0.24	-1.29
United Kingdom	-14.03	-6.95	.	-6.95
Total	-98.23	0.00	0.80	0.80

Source: Eurostat, 2019. Own calculations.

Note: Column 2 shows the actual secondary income balance per country. Column 3 comprises the net budget contributions per Member State. Column 4 shows personal household transfers between residents and non-residents (BoP Series D752). Column 5 provides an estimate of the Member States' secondary income balance based on the row-wise summation of Column 3 and 4. All values refer only to BoP positions vis-à-vis EU Member States.

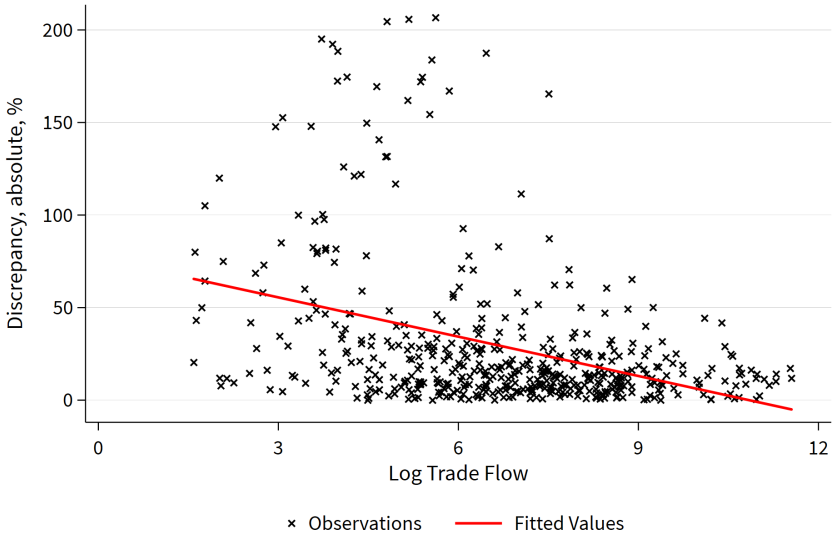
Figure 2.5: Distribution of Discrepancies, 2018, in %



Source: Eurostat, 2019. Own illustration.

Note: The table shows the distribution of discrepancies as defined in Equation 2.3.

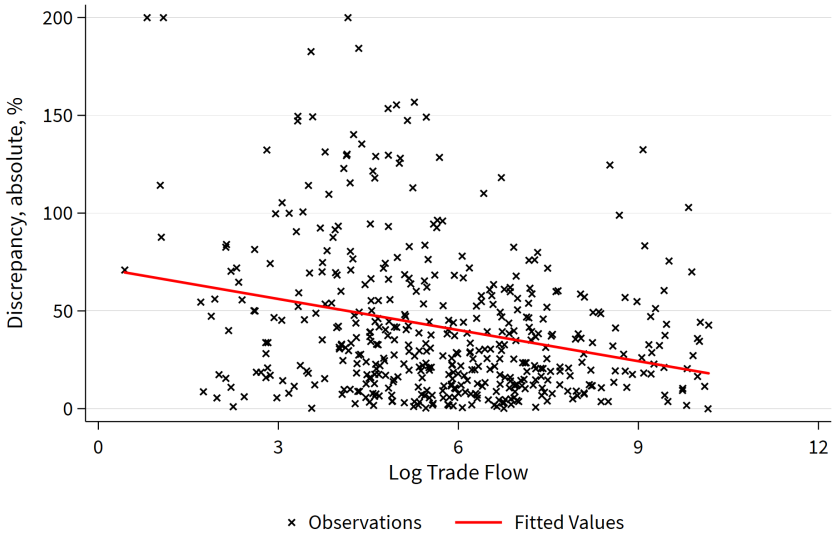
Figure 2.6: Scatter Plot: Trade Volume and Discrepancies, Goods, 2018



Source: Eurostat, 2019. Own illustration.

Note: The figure plots the average trade flow (logarithmic scale) versus absolute discrepancies as defined in Equation 2.3. Fitted values according to OLS.

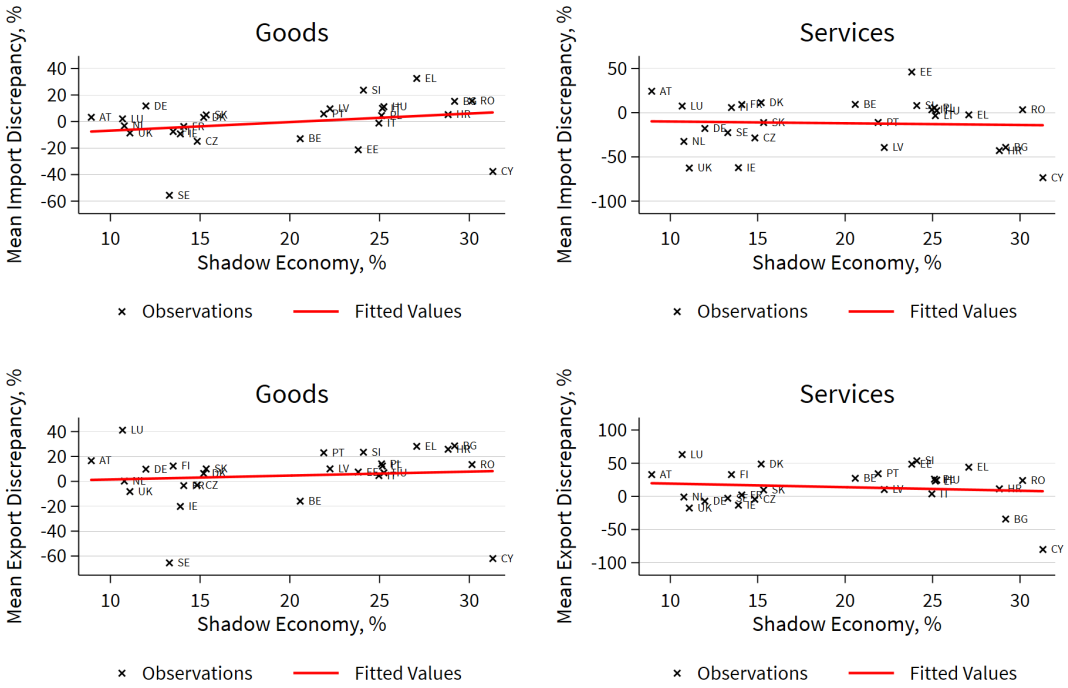
Figure 2.7: Scatter Plot: Trade Volume and Discrepancies, Services, 2018



Source: Eurostat, 2019. Own illustration.

Note: The figure plots the average trade flow (logarithmic scale) versus absolute discrepancies as defined in Equation 2.3. Fitted values according to OLS.

Figure 2.8: Mean Discrepancy per Country and Size of the Shadow Economy



Source: Medina and Schneider (2018). Eurostat, 2019. Own illustration.

Note: The figure plots the size of the shadow economy versus absolute discrepancies as defined in Equation 2.4 (2018 values). Fitted values according to OLS.

Figure 2.9: Mean Discrepancy per Country and Institutional Quality

Source: World Bank, 2019. Eurostat, 2019. Own calculations.

Note: The figure plots a governance index (combined measure) versus absolute discrepancies as defined in Equation 2.4 (2018 values). Fitted values according to OLS.

Table 2.6: Country Pair Discrepancies, Goods, 2018, Bottom 25, mn EUR and %

Country 1	Country 2	Trade Volume	Discrepancy
Sweden	Bulgaria	226.2	187.0
Romania	Sweden	526.0	180.5
Sweden	Slovenia	283.7	173.3
Sweden	Cyprus	75.6	170.6
Croatia	Sweden	129.0	157.2
Luxembourg	Sweden	173.8	152.0
Sweden	Greece	362.5	145.7
Cyprus	Hungary	74.6	119.7
Cyprus	Poland	121.5	113.0
Cyprus	Germany	2,413.0	102.3
Luxembourg	Croatia	77.0	101.3
Latvia	Sweden	1,084.3	101.0
Portugal	Cyprus	46.0	100.3
Austria	Finland	2,978.5	99.4
France	Slovenia	2,305.3	98.1
Cyprus	Lithuania	31.8	94.8
Sweden	Slovakia	1,184.6	92.5
Hungary	Sweden	1,852.3	89.2
Luxembourg	Hungary	281.5	86.5
Lithuania	Ireland	52.4	81.7
Sweden	Portugal	952.3	81.5
Ireland	Cyprus	122.5	81.0
Cyprus	Finland	96.0	80.7
Cyprus	Italy	823.0	78.8
Ireland	Sweden	479.9	78.0

Source: Eurostat, 2019. Own calculations.

Note: Trade volume is average of a country pair's reported bilateral credit and debit positions according to BoP data in mn EUR. Country pair discrepancies are defined as in Equation 2.5.

Table 2.7: Country Pair Discrepancies, Services, 2018, Bottom 25, mn EUR and %

Country 1	Country 2	Trade Volume	Discrepancy
Croatia	Cyprus	2.3	200.0
Cyprus	Estonia	98.5	191.3
Estonia	United Kingdom	365.8	152.1
Cyprus	Poland	360.8	151.3
Latvia	Cyprus	100.5	142.2
Cyprus	Lithuania	71.5	140.4
Cyprus	Finland	98.5	139.7
Hungary	Ireland	293.9	128.5
Belgium	Cyprus	253.0	123.1
Czechia	Cyprus	128.7	122.5
Portugal	Cyprus	161.0	114.8
Austria	Cyprus	227.0	111.1
Luxembourg	United Kingdom	17,736.3	107.9
Latvia	Slovenia	14.3	103.1
Estonia	Hungary	26.6	102.2
Lithuania	Ireland	252.4	102.0
Italy	Croatia	1,054.5	100.9
Croatia	Estonia	11.2	98.5
Romania	Ireland	593.5	96.2
Cyprus	Italy	235.5	94.6
Denmark	United Kingdom	11,507.4	90.8
Estonia	Czechia	63.2	90.1
United Kingdom	Slovenia	294.1	85.1
Sweden	Slovenia	107.3	81.7
Greece	Croatia	44.0	81.6

Source: Eurostat, 2019. Own calculations.

Note: Trade volume is average of a country pair's reported bilateral credit and debit positions according to BoP data in mn EUR. Country pair discrepancies are defined as in Equation 2.5.

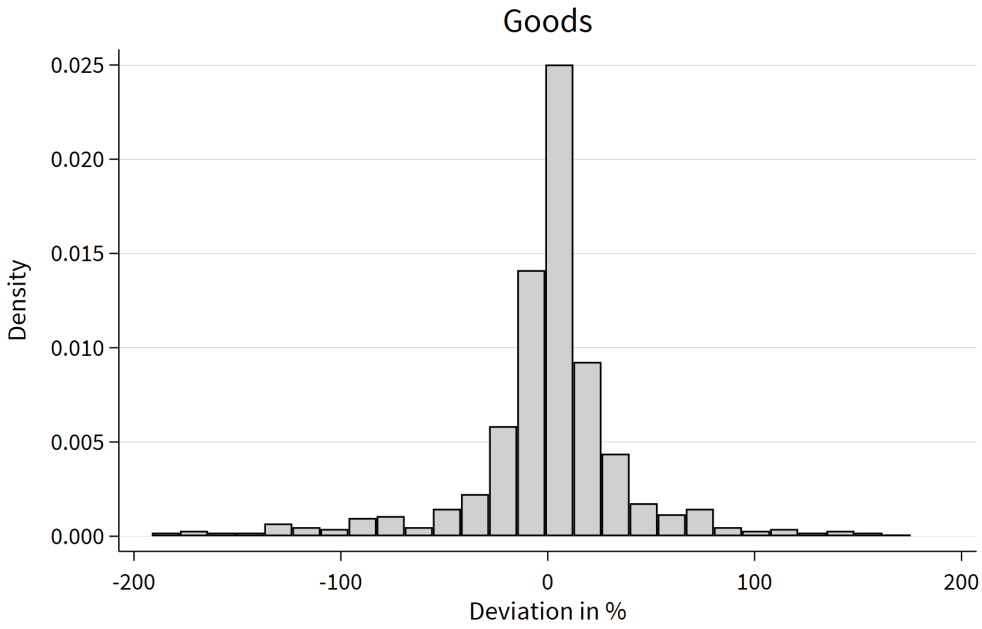
Table 2.8: Regression Analysis: Country Fixed Effects, Discrepancies in %

	Goods BoP		Services BoP		Goods Comext	
	(1)		(2)		(3)	
Austria	11.5**	(4.9)	9.3**	(4.0)	3.9**	(1.5)
Belgium	9.4**	(3.8)	11.2**	(4.5)	1.2	(2.2)
Bulgaria	17.1	(14.1)	24.0***	(8.7)	9.7***	(3.0)
Cyprus	66.6***	(6.4)	82.3***	(12.0)	55.7***	(6.2)
Czechia	0.7	(4.2)	24.5***	(4.2)	4.2	(2.6)
Germany	1.2	(4.0)	12.7**	(6.1)	-5.8***	(2.1)
Denmark	-1.7	(9.1)	19.4**	(8.9)	2.2	(1.5)
Estonia	11.7**	(5.4)	36.4***	(9.3)	19.2***	(4.7)
Greece	22.3**	(11.2)	8.9	(9.3)	12.2***	(3.6)
Spain	0.0	(.)	0.0	(.)	6.8*	(3.6)
Finland	12.7**	(5.4)	14.4***	(4.4)	3.3	(2.1)
France	6.3	(5.4)	11.2***	(3.9)	0.2	(2.5)
Croatia	14.4***	(5.2)	32.4***	(6.8)	10.4***	(3.9)
Hungary	11.1***	(2.6)	19.5***	(5.2)	7.5**	(3.2)
Ireland	17.5***	(4.3)	29.6***	(8.6)	28.8***	(4.6)
Italy	1.9	(3.6)	8.0	(5.0)	-1.4	(2.6)
Lithuania	8.2	(5.0)	16.0***	(6.0)	11.6**	(4.9)
Luxembourg	60.2***	(11.5)	34.0***	(10.4)	38.9***	(6.2)
Latvia	9.7***	(3.4)	26.8***	(5.6)	10.2***	(3.7)
Malta	0.0	(.)	0.0	(.)	62.8***	(6.1)
Netherlands	9.2***	(2.9)	12.1***	(4.6)	2.5	(1.9)
Poland	1.0	(3.9)	12.3***	(3.7)	6.2*	(3.5)
Portugal	15.0***	(3.0)	18.5***	(3.1)	9.8***	(2.8)
Romania	7.9	(5.6)	12.6***	(4.5)	5.3**	(2.6)
Sweden	59.9***	(12.0)	10.2**	(4.8)	3.7*	(2.0)
Slovenia	20.9***	(7.1)	21.0***	(7.4)	11.3***	(2.9)
Slovakia	18.1***	(5.9)	1.7	(6.7)	17.3***	(5.2)
United Kingdom	-0.0	(3.4)	27.1***	(6.8)	3.0	(3.2)
Observations	248		237		378	

Source: Comext, 2019. Eurostat, 2019. Own calculations.

Note: Ordinary Least Square Regressions with heteroskedasticity robust standard errors. Country fixed effects are the only explanatory variables. Dependent variable is country pair discrepancies as defined by Equation 2.5 (2018 values). ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

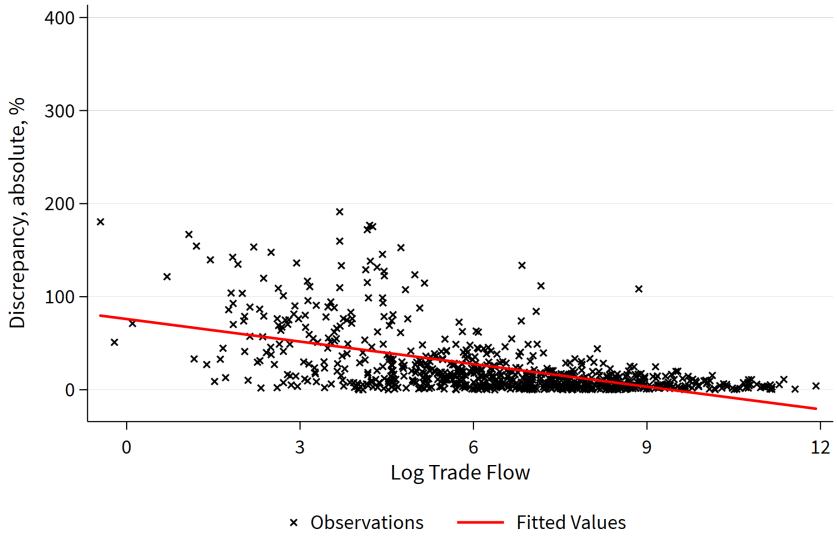
Figure 2.10: Sensitivity Analysis: Distribution of Discrepancies, 2018, in %



Source: Comext, 2019. Own illustration.

Note: The table shows the distribution of discrepancies as defined in Equation 2.3.

Figure 2.11: Sensitivity Analysis: Trade Volume and Discrepancies, Goods, 2018



Source: Comext, 2019. Own illustration.

Note: The figure plots the average trade flow (logarithmic scale) versus absolute discrepancies as defined in Equation 2.3. Fitted values according to OLS.

Table 2.9: Sensitivity Analysis: Mean Discrepancies per Country, 2018, %

Country	Exporter	Importer
Austria	3.9	0.6
Belgium	6.7	9.5
Bulgaria	17.2	11.1
Croatia	23.5	0.8
Cyprus	-67.7	-34.4
Czechia	12.1	10.8
Denmark	-2.1	-2.7
Estonia	9.4	-8.3
Finland	-0.2	6.6
France	-3.8	2.9
Germany	2.7	0.7
Greece	26.3	10.4
Hungary	16.3	12.9
Ireland	-24.7	-25.6
Italy	3.0	-2.1
Latvia	8.8	14.8
Lithuania	5.2	17.2
Luxembourg	-48.3	-27.3
Malta	-72.8	-49.1
Netherlands	13.3	2.1
Poland	14.3	3.0
Portugal	14.5	2.3
Romania	13.9	9.3
Slovakia	32.5	13.2
Slovenia	14.5	8.1
Spain	12.8	11.0
Sweden	-12.6	-0.4
United Kingdom	-10.6	-5.7

Source: Comext, 2019. Own calculations.

Note: Column 1 shows the average discrepancy in bilateral trade for the respective country being an exporter. Column 2 shows the average discrepancy in bilateral trade for the respective country being an importer. Discrepancies are defined as in Equation 2.4. All values refer only to bilateral trade vis-à-vis the listed countries.

Table 2.10: Sensitivity Analysis: Country Pair Discrepancies, Goods, 2018, Bottom 25, mn EUR and %

Country 1	Country 2	Trade Volume	Discrepancy
Estonia	Malta	9.6	167.1
Cyprus	Poland	191.0	142.3
Luxembourg	Slovakia	260.7	138.3
Malta	Slovakia	12.3	123.3
Cyprus	Hungary	76.2	122.0
Cyprus	Latvia	19.8	113.4
Bulgaria	Malta	80.9	110.6
Croatia	Luxembourg	82.6	106.6
Spain	Lithuania	1,851.7	103.9
Malta	Slovenia	17.4	101.8
Cyprus	Portugal	46.9	101.8
Ireland	Slovakia	215.2	99.5
Greece	Luxembourg	53.1	98.2
Latvia	Malta	9.6	97.8
Luxembourg	Malta	5.1	95.5
Ireland	Malta	89.3	92.5
Malta	Portugal	78.8	91.5
Malta	Poland	88.8	90.7
Czechia	Malta	45.8	89.1
Hungary	Luxembourg	249.2	88.6
Cyprus	Luxembourg	7.5	88.0
Finland	Malta	18.4	87.8
Cyprus	Finland	93.0	87.7
Bulgaria	Luxembourg	45.2	84.9
Cyprus	Lithuania	31.8	81.8

Source: Comext, 2019. Own calculations.

Note: Trade volume is average of a country pairs' reported bilateral exports and imports according to Comext in mn EUR. Country pair discrepancies are defined as in Equation 2.5.

Table 2.11: Sensitivity Analysis: Country Pair Discrepancies, 2018

	Goods		
	(1)	(2)	(3)
log Trade	-8.11***	-7.61***	-3.10
	(0.64)	(0.73)	(2.65)
log Distance		7.72***	7.60
		(2.57)	(5.26)
Common Border		9.56***	6.88**
		(3.38)	(2.95)
Common History		2.04	-1.90
		(4.44)	(4.66)
Common Language		11.98***	-4.46
		(3.54)	(4.25)
Δ VAT Rate		1.31**	0.93
		(0.58)	(0.60)
Observations	378	378	378
R^2	0.39	0.42	0.63
Country FE			✔

Source: CEPII, 2019. Comext, 2019. Own calculations.

Note: Ordinary Least Square Regressions with heteroskedasticity robust standard errors. Dependent variables are country pair discrepancies as defined by Equation 2.5. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Chapter 3

On the Political Economy of Free Trade

"At any rate, the lesson from history seems to be that continued globalization cannot be taken for granted. If its consequences are not managed wisely and creatively, a retreat from openness becomes a distinct possibility."

Rodrik (2011)

"I will argue that we are transitioning from an old world of trade to a new world of trade where trade opening has become a very different game. This transformation has major consequences which will likely—and hopefully—impact the international trading system, be it in terms of principles, policies, and even mandates, as illustrated, for instance, in the recent and turbulent beginning of the so-called Transatlantic Trade and Investment Partnership (TTIP)."

Lamy (2015)

3.1 Background and Related Literature

Aggregate economic benefits of free trade are a well-established finding in both theoretical and empirical research. However, a renewed strengthening of protectionist politics has become increasingly popular in many industrialized economies. U.S. President Donald Trump is on the verge of beginning serious trade wars, which would constitute a severe threat to the rules-based global trading system, to support his domestic political agenda. He thereby follows a distinct anti-globalization ideology which already became visible during his election campaign. This is probably the most destructive form of a trend that is certainly not unique to the U.S.: a process of rethinking global economic integration in many advanced economies. The UK's vote to leave the European Union in 2016 was, after all, a plebiscite for national sovereignty at the cost of some degree of economic prosperity. Prior to that, massive protests against the Transatlantic Trade and Investment Partnership (TTIP) especially in German-speaking Europe has already demonstrated that a growing number of people prefers regulatory independence to additional economic gains from trade. Policy debates surrounding the mentioned events reflect a dramatic divergence between public opinions and traditional academic perspectives which entail an overemphasis of advantages of ever increasing international economic integration, thereby neglecting the political economy of these processes.

Dani Rodrik was one of the first to point out the political economy trade-off behind globalization. He became known for what he calls "the political trilemma of the world economy" (Rodrik, 1998).[1] According to Rodrik, societies must choose two out of three objectives; the three objectives are:[2] (1) the nation state in the sense of national sovereignty and legislative autonomy, (2) mass politics in the sense of democratically legitimated decision making[3], and (3) international economic integration. In a chronological manner, Rodrik elaborates on how each of the possible choices has been implemented during the past century: The first era of globalization, which came to an abrupt end with the beginning of World War I, was characterized by independent nation states maintaining a high degree of international economic integration under the gold standard (in Rodrik's terms "Golden Straitjacket"). The re-establishment of the gold standard after WWI failed mainly due to the resulting high social cost (e.g. unemployment, deflation) which conflicted with the increasing political participation of the working class. This conflict could only be dissolved by the "Bretton-Woods-Compromise" facilitating the coexistence of indepen-

[1] Later, these ideas were published in Rodrik (2011).

[2] Note that in later versions, his terminologies have slightly changed.

[3] More precisely, he defines mass politics as politics based on an unrestricted franchise, a high degree of political mobilization, and political institutions that are responsive the mobilized groups.

dent nation states and mass politics. However, this system limited the scope for global economic integration as its functioning required capital controls, for instance.

After its termination in 1973 and a period of weak income growth, a new era began shifting the political focus towards deep international economic integration. This, in turn, required—given a consensus that mass politics, or better democracy, is non-negotiable—a step by step reduction of national sovereignty. International organizations such as the WTO were set up to administer this process by forming something that Rodrik calls "Global Federalism". The most ambitious project in this respect was the transformation of the European Community into the European Union following the Maastricht Treaty in 1992. The implementation of a currency union, the realization of the four freedoms in the single market, and the legal supervision by a supra-national court will ultimately lead to a dissolution of the EU's Member States as nation states in a classical sense. The initially mentioned political events reflect this trade-off between international economic integration and the democratic nation state particularly well.

When it comes to EU trade politics, we observe precisely what Dani Rodrik describes: opponents of Free Trade Agreements (FTAs) refer to the fact that deep and comprehensive trade agreements limit the scope of legislative autonomy. Not every argument they make is worth a closer look; many are exaggerated, or even utterly wrong. However, the strong criticism of investor state dispute settlements highlights legitimate concerns about a valid issue: the loss of legislative autonomy.[4] By this means, the Globalization Trilemma is triggered. The former EU Commissioner for Trade and Director General of the WTO Pascal Lamy (2015) underlines similar thoughts by proclaiming a "New World of Trade". At the risk of simplification, this new world of trade can briefly be described as follows: technical progress turned national production systems into regionally integrated or even global supply networks (Grossman et al., 2006). Formerly, in order to prevent states from manipulating production systems to their national advantage, quotas, tariffs, and subsidies were subject to trade negotiations.

By contrast, recent obstacles to trade are the administration of precaution, including but not limited to security, safety, health, and environmental sustainability. The predominant role of efforts to eliminate non-tariff barriers in recent free trade agreements directly affects policy areas that are sensitive to the broader public. However, increasingly comprehensive FTAs are not only a consequence of "efficiency-obsessed" free traders; the

[4] Clearly, proponents would not disagree but would rather stress that this loss of legislative autonomy is desirable as it commits a government to a rule-based order. Hence, proponents and opponents differ in their preferences for legislative autonomy but they share the view that national autonomy is at stake when international investment protection treaties are closed.

reason for their existence is also related to lobby group interests[5] as well as hidden protectionism[6]. Paradoxically, the complexity of modern FTAs is to some extent due to their opponents.

Pascal Lamy also points out that nowadays patterns of support and disapproval of trade liberalization are diametrically opposed to traditional ones: in the past, consumers favored tariff reductions in the hope of lower prices, while domestic producers often disapproved of them fearing increased competition and thereby losing their monopoly rents. What Richard Baldwin (2016) calls "Globalization's Third Unbundling" is in principle the expansion of trade in services, which adds another facet to this "New World of Trade". At odds with the formerly observed pattern, producers are now in favor of regulatory convergence because of cost saving while the opposition is formed by consumers, or more precisely, by consumer organizations. Needless to say, as traces of the "Old World" still exist the diverging lines are fluent and exemptions still prove the rule. However, the mere existence of a public debate on recent trade deals, e.g. TTIP in the European, and TPP and NAFTA in the U.S.-American debate, indicates that public interest in trade policy has become increasingly important. Previously difficult to imagine, campaigns against FTAs succeed to form a movement that mobilizes masses and creates influential waves of protest.

In our opinion, a sound understanding of individual preferences for free trade and globalization is of utmost importance in order to assess the democratic legitimacy of open-market policies. This chapter thus fills the gap between international economics and political economy. It sheds light on drivers, time trends, and correlations of attitudes towards open-market policies in EU member states on the individual, regional, and national levels. For the purpose of this chapter, we address the following questions:

First, what are the key characteristics that supporters and opponents of international economic integration have in common? Preferences for and against open-markets are shaped via two fundamentally different channels: economic self-interest and values. Exploring the former channel, we can employ observable socio-economic factors that are likely to determine individual economic outcomes of free trade. According to the Heckscher–Ohlin or the Specific Factors model, one would expect correlations between skill levels and preferences for free trade. If, by contrast, individuals care about national identity, independence, or autarky per se they are likely to express open-market attitudes that are

[5] For instance, in the EU Japan FTA animal welfare groups insisted making an improvement of animal welfare an explicit goal of the FTA.

[6] Labor unions, e.g. demand for high labor protection standards being part of FTA in order to prevent trade partners from "unfair competition" related to what they call "dumping wages".

based on their values and ergo against their economic self-interest. Our aim is to separate the effect of economic self-interest from value preferences.

Second, as our data allow to break down average attitudes towards globalization to the regional level (NUTS2 or NUTS3[7]) we are interested in explaining the large variation in the support of open-market politics in the EU. Recent strands of the literature following Autor et al. (2013) have emphasized heterogeneous regional effects of trade policy. We examine region-specific fundamentals, e.g. macro variables, that may explain the observed patterns. It stands out that macro variables such as unemployment, regional trade exposure, GDP level, and EU transfers can partly explain the cross-region variation.

Third, we have a closer look at inconsistent responses. For instance, we observe individuals who reject TTIP but are generally in favor of free trade (and vice versa). We can also identify inconsistent group thinking phenomena. For instance, we observe a decline in the support of free trade among older people. However, the support of protectionism declines with age as well. As free trade and protectionism constitute antagonisms, response patterns like these are puzzling and hence worth a closer examination. They could be the result of ignorance, arbitrariness, a misunderstanding about the terms' actual meaning, or of a status-quo bias.

This chapter is closely related to Mayda and Rodrik (2005), who, based on survey data from 23 countries in 1995, find that pro-trade preferences are correlated with individual human capital and trade exposure to the individual sector of employment. They find that high degrees of neighborhood attachment and nationalism is associated with protectionist tendencies. We test their findings based on new data and show some differences indicating that political economy of trade has changed.

Dutt and Mitra (2005) investigate the relation between government ideology and endogenous trade policy; according to their findings, left-wing governments tend to adopt more protectionist trade policies in capital-rich countries and more pro-trade policies in labor-rich economies. Rho and Tomz (2017) challenge the underlying assumption of international political economy of individual policy preferences that reflect economic self-interest. According to them, economic ignorance ultimately causes voting behavior contradicting rational considerations. Moreover, their experiments indicate that individuals express more selfish interests once they learn how trade policies directly affect them. Additionally, the framing of information that is provided to participants substantially

[7] The acronym NUTS denotes the "Nomenclature des unités territoriales statisques", a regional classification used by Eurostat. The numbering indicates the respective level on descending order, e.g. NUTS3 has a higher resolution than NUTS2. For further information, click *here*.

matters for the outcome. This is in line with our finding which provides evidence that national narratives of a certain open-market policies are relevant for their acceptance.

Going one step further, Caplan (2007) argues that not "economic ignorance" but four biases (Anti-Market Bias, Anti-Foreign Bias, Make-Work Bias, and Pessimistic Bias) shape individual preferences. Caplan claims that these biases all work against open-market policies. In our setting, these biases may explain why some people favor protectionism although it is in fact disadvantageous for them (e.g. unemployed persons, who do not have a job that can be protected but who would face higher prices). Pitlik (2016) links TTIP approval to distrust in multinational enterprises. According to TTIP opponents, it is these enterprises that would gain the most from this FTA.

Grossman and Helpman (2018) argue theoretically that not only individual outcomes of trade policies shape voters' preferences; group affiliation determines open-market attitudes to the extent to which the status of the social group is affected by international trade. For our regional analysis, we employ similar measures as Becker et al. (2017) who used a rich set of district-level data in order to analyze Brexit vote outcomes. Dorn et al. (2016) use a measure for import competition to explain electoral outcomes in the U.S. and find that districts, which are more exposed to import competition display a higher degree of political polarization. In this chapter, we also investigate whether import competition directly affects trade attitudes.

We acknowledge the fact that certain endogeneity issues, such as omitted variable and reverse causality problems, make it difficult to establish causation. Any assessment of individual attitudes, mostly based on survey data, is inevitably disputable. However, by exploiting a rich set of individual characteristics as well as fixed-effects, our data allow controlling for many potential channels through which omitted variable biases could interfere. In cases, in which we cannot exclude having identified correlations only, we state this explicitly. Other well-established estimation approaches, for example applying time-leads of explanatory variables, may resolve potential endogeneity issues, too. Nevertheless, we believe that conditional correlations, which are a priori not obvious, can be insightful and valuable for the understanding of international political economy. Moreover, our aim is to identify groups of variables that can explain a substantial fraction of the variance of the outcome variables.

The outline of the chapter reads as follows: Section 3.2 provides an overview of our data bases and provides some descriptive statistics in order to motivate our research question. Section 3.3 derives some theoretical predictions and explains the empirical strategy, which is used to test the aforementioned hypotheses. Subsequently, Section 3.4 discusses the results at both the individual level (refer to Subsection 3.4.1) and the regional level (see Subsection 3.4.2). Section 3.5 summarizes the main results and concludes.

3.2 Data Description

The Standard Eurobarometer (EB) was established in 1974 in order to monitor opinions of citizens across EU Member States and candidate countries. From the outset, the EB had a strong focus on opinions about the common market, asking for attitudes towards free trade and globalization in general but also addressing concrete policy topics, such as the Transatlantic Trade and Investment Partnership. We exploit this rich data set to better understand the political economy behind international economic integration. The EB survey is one of the world's largest survey based repeated cross-sections biannually interviewing 1,000 participants in each EU Member State. The interviews take place in each spring (March/April) and fall (October/November).

The question concerning TTIP was first included in the second semester of 2014 and has repeatedly been posed in all waves since then.[8] The corresponding variable is binary (*for* vs. *against*) and, thus, does not need any further preparation. Additionally, we evaluate so-called concept images which are included in the EB: after participants are confronted with simple terms or statements, they are asked to answer "whether the term brings to mind something *very positive*, *fairly positive*, *fairly negative*, or *very negative*". These concept images are implemented, among others, for the terms *Free Trade*, *Protectionism*, and *Globalization*. A further question asks whether globalization is considered as an opportunity for economic growth; the set of potential answers again comprises 4 possibilities: *totally agree*, *tend to agree*, *tend to disagree*, and *totally disagree*. As long as the concept images and the question concerning globalization as an opportunity serve as dependent variables, they are re-coded into binary variables by combining the two positive response options and the two negative response option, respectively. When we introduce the concept of "strong preferences", we focus only on those individuals choosing the answers *totally agree* and *totally disagree*. All dependent variables take the value 1 if the individual is in favor of TTIP, Free Trade, Protectionism, or Globalization, respectively. For the sake of simplicity, the variable "globalization as opportunity for economic growth" is called "Globalization Growth" while the concept image of globalization is referred to as "Globalization Image".

In total, we employ a data set including 166,000 observations. Thus, measurement errors—as long as they are non-systematic—are not expected to bias our results in any direction. The data cover 28 EU Member States plus two additional regions.[9] At the

[8] The latest available wave stems from 2017-1.

[9] Germany is reported twice (Germany-East and Germany-West). The same applies for the United Kingdom (Great Britain and Northern Island).

sub-national level, data for most countries are available at the NUTS-2 level.[10] Due to a rich set of of socio-economic control variables and other individual characteristics provided by the survey, we are able to identify systematic patterns of correlations which shape open-market attitudes.

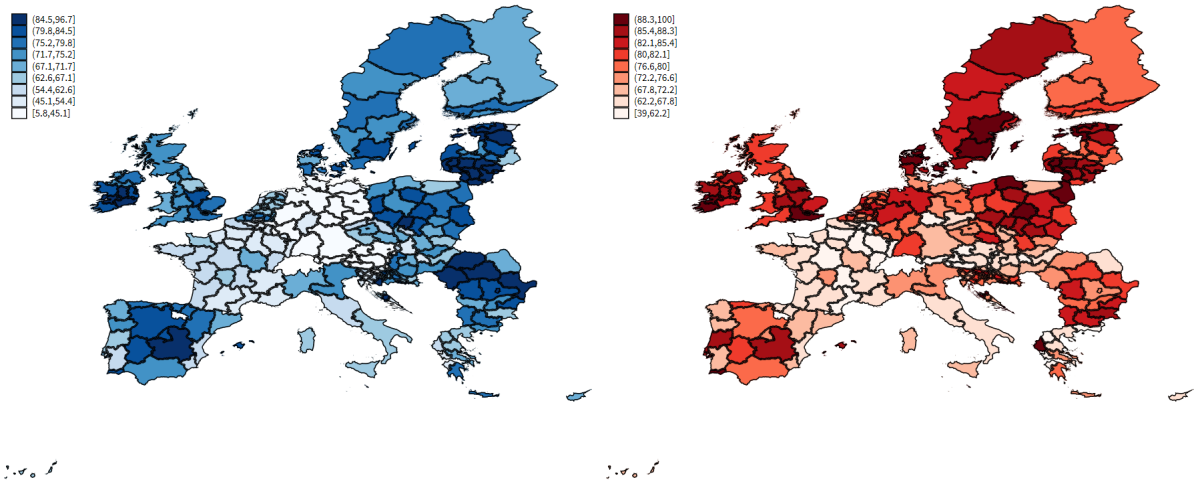
In order to stress the strong regional and national heterogeneity observed in the independent variables, Figure 3.1 shows regional average approval rates with respect to TTIP and Free Trade. At the national level, the lowest TTIP approval rates are found in Austria (on average 27 percent), and the highest in Lithuania (91 percent)[11]. The unweighted European mean is 67.2 percent, the population weighted mean is 63.8 percent. The variation of attitudes towards free trade is remarkably lower, it ranges from only 59 to 91 percent. The correlation between the two variables is positive, the correlation coefficient yields 0.62. It is striking that the public approval rate of TTIP exceeds the approval rate of free trade in only 22 percent of the all regions. At the national level, this is the case in Cyprus, Hungary, Lithuania, and Portugal. With respect to a few countries, a substantial and steeply declining gap between TTIP approval rates and the free trade concept image becomes visible: these countries are Austria, Germany, Luxembourg, and Slovenia. This may be due to different reasons: a public perception that new and comprehensive trade agreements differ from a conventional understanding of free trade, or general mistrust in conducting free trade with the USA (i.e. anti-Americanism). Also, TTIP is a rather recent treatise and respondents have to evaluate it in an anticipatory manner. Their attitude towards free trade, on the other hand, can be affected by personal experience.

Figure 3.2 illustrates the distribution of different open-market attitudes of European citizens. It also includes non-responses. The following observations are noteworthy: first, Europeans have a strong belief in the benefits of free trade. Roughly 69 percent of the respondents assess free trade as either favorable or very favorable; more than 56 percent believe that globalization is a chance for economic growth. Only 44.8 of the interviewed people are favorable towards globalization. Due to a 14.1 percent share of non-responses, this still constitutes the relative majority. Preferences for protectionism are relatively balanced: for a weak relative majority of 40.7 percent, protectionism is not favorable, while 37.8 percent approve of the idea of protectionism. This is contradictory to the formerly observed response pattern of the free trade concept image. Interestingly, the survey participants chose the answer "don't know" most frequently in response to the question on protectionism. This may indicate little knowledge on protectionism among the respondents. The responses to the binary question concerning TTIP shows that a

[10] For the United Kingdom, Germany, and Italy only NUTS-1 regional data can be employed. For Croatia, Estonia, Latvia, Lithuania and Ireland, higher resolution NUTS-3 level data are available.

[11] unconditional mean.

Figure 3.1: Regional attitudes towards TTIP and Free Trade



Source: Eurobarometer, 2017. Own illustration.

Note: The left/right figure illustrate the average support for TTIP/Free Trade in percent in the 247 NUTS regions in Europe. The same figures for the outcome variables globalization image, globalization growth, and protectionism are shown in the Appendix.

vast majority of Europeans is in favor of this FTA. Figure 3.2 also demonstrates that most individuals do not have what we call strong preferences as they seemingly tend to report preferences for centered responses.

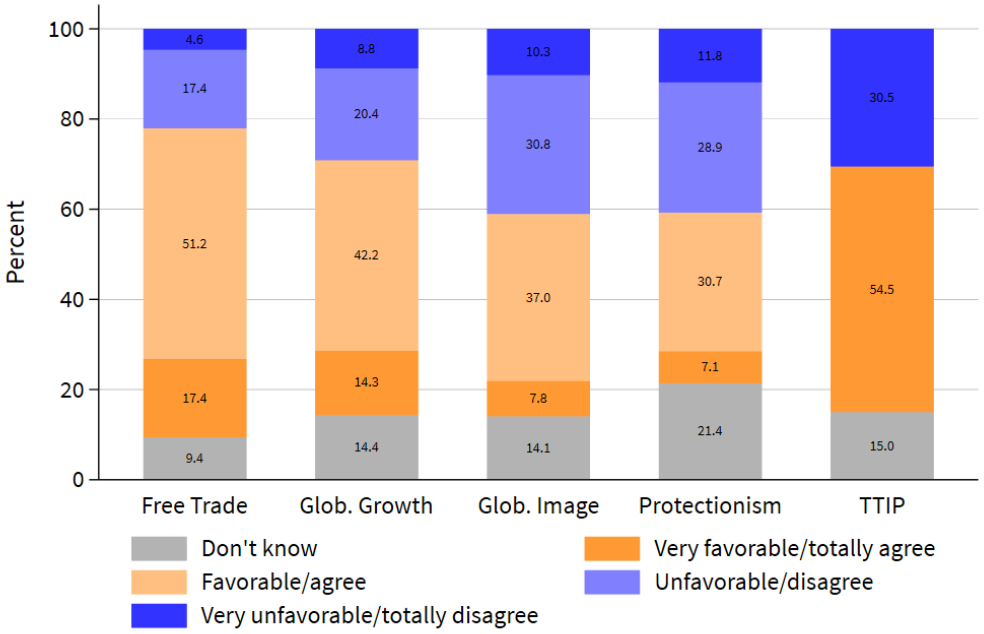
For a better understanding of the data, we want to show a simple variance decomposition. In a panel consisting of n countries at t time observations, the outcome variable (national mean of any attitude[12]) is obviously a linear combination of n country and t time dummy variables. Table 3.1 disentangles to what extent open-market attitudes differ across countries and within countries over time. It stands out that for all variables the between variance is larger than 90 percent, while the within variance is 4 percent for TTIP and equal or less than 1 percent for all other open-market attitudes.[13]

We can conclude that variation over time does not play an important role given the short time span covered by our data (2014-2017). This does not come as a surprise as structural changes related to globalization are long lasting processes and take longer time periods to fully materialize. The decline of the Rustbelt in the U.S.—often considered as one of the reasons for the outcome of the U.S. presidential election in 2016—did not take place within a few years but stretched across decades. Hence, we focus on cross-country

[12] excluding missings.

[13] Note that this is also driven by the fact that some questions were not asked in every survey wave.

Figure 3.2: Distribution of Responses



Source: Eurobarometer, 2017. Own illustration.

Note: The figure illustrates the response distribution for the variables of interest over all conducted surveys under investigation (2014-2 to 2017-1). Responses are population weighted (country-wise) for the calculation of a European average.

Table 3.1: Panel Variance Decomposition

	TTIP	Free Trade	Protectionism	Glob. Opportunity	Glob. Image
Between	0.913	0.915	0.956	0.938	0.942
Within	0.039	0.010	0.001	0.009	0.007
Combined	0.952	0.923	0.957	0.947	0.948

Source: Eurobarometer, 2017. Own calculations.
Note: The table shows the panel variance decomposition for the five dependent variables. The variance is decomposed by the comparison of R-Squares using country vs. time fixed effects. The variance between reflects the variance across countries, the variance within the time-variance within countries.

and cross-regional variation. Figure 3.1 illustrates variation across regions and highlights country fixed-effects. Table 3.2 shows the share of variation across regions which cannot be explained by country fixed-effects.[14] Country fixed-effects can explain the regional TTIP attitudes best. In this way, only 20 percent remain unexplained. When it comes to other open-market attitudes, country fixed-effects can account for less of the variation:

[14] Note that we eliminate the time dimension in order to calculate regional means.

35 percent of the attitudes towards free trade are left unexplained. Protectionism is least explained by nation-wide characteristics, while regional preferences for globalization depend on regional variation by 27 and 35 percent, respectively.

Table 3.2: Variation Across Regions

	TTIP	Free Trade	Protectionism	Glob. Opportunity	Glob. Image
Regional variation	0.199	0.348	0.384	0.268	0.354

Source: Eurobarometer, 2017. Own calculations.
Note: The table shows the variance across regions within countries for the five dependent variables. The variance is 1 minus the R-Square statistics of a cross-sectional regression that includes only country fixed-effects.

By construction, low numbers of observations and resulting drawbacks related to small-sample regressions are detrimental to the quality of cross-country analysis. In order to increase the number of observations, and to assess regional differences within countries, we implement regional identifiers and calculate attitudes at the regional level. Unfortunately, regional data at the same resolution are not available for all countries. As we do not want to aggregate at the highest level (NUTS-1), we apply regional data at different NUTS levels. For the sake of convenience, we use the term region synonymously for NUTS-1 regions in Germany and the UK, NUTS-3 regions in Croatia, Estonia, Ireland, Latvia, and Lithuania and NUTS-2 regions in all other EU Member States. In total, we arrive 247 European regions.

The macroeconomic variables of interest are taken from Eurostat. We use data from the year 2016 on median age of population, GDP level (in PPPs), unemployment rate, and EU regional transfers. The latter data are made available by Becker et al. (2013)[15]. Our aim is to identify the variables that shape regional attitudes, which are typically formed over a long period of time and remain relatively stable. The aforementioned cross-sectional observations fit this approach as they show only little time variation but large regional variation. By contrast, economic performance measured by current GDP growth is too noisy. Thus, we investigate the effect of GDP growth over the past decade on regional attitudes. Aside from Eurobarometer and Eurostat data at the regional level, we employ regional trade exposure data from Badinger and Reuter (2017)[16], who provide changes in import and net-export exposure at the NUTS-3-level for the two time spans, namely

[15] We are thankful to Sascha O. Becker, Peter Egger, and Maximilian von Ehrlich for sharing their data.
[16] We are thankful to Harald Badinger and Wolf Heinrich Reuter for sharing their data with us.

1991-2001 and 2001-2011; the regional exposure is calculated following the approach of Autor et al. (2013) and takes the following form:

$$\Delta E^{M}_{i_r pt} = \sum_{j=1}^{J} \frac{L_{i_r jt}}{L_{ijt}} \frac{\Delta M^{p}_{ijt}}{L_{i_r t}} \tag{3.1}$$

The change in import exposure (ΔE^M) is the change of total imports (M) over period t in industry j per employed person (L) in country i´s region r coming from partner country p. Change in imports is then assigned to country i's region r according to its share in country i's total employment in industry j. Total import exposure ($\Delta E^M_{i_r pt}$) of region i_r from partner country p is then obtained by summing up the import changes in industry j assigned to region i_r over all industries.

Figure 3.1 shows the variation across European NUTS regions using the example of TTIP and free trade approval rates. Both figures reveal substantial spatial variation that is related to the geographic location displaying the following pattern: lower rates in the core and higher rates in the periphery of the EU. In order to account for this effect, we construct a measure "Distance to Brussels" which is the great-circle distance between the center of a region to Brussels.[17] This measure controls for any structural difference between core and peripheral countries and captures institutional quality, cultural aspects, as well as economic development.

3.3 Hypotheses and Empirical Strategy

This section first introduces the chosen econometric model and then develops testable hypotheses for both individual and regionally aggregated preferences.

3.3.1 Estimation

In order to identify the determinants of individual preferences for open markets, we begin by applying ordinary least square estimates. Due to its linear structure, an interpretation

[17] For the calculation, the harvesine formula is applied. This approach measures the shortest distance between geographic locations, and is thus referred to *as the crow flies*.

of the magnitude of the reported effects can easily be established. The estimated linear probability model takes the following structural form:

$$\mathbb{1}_{i,j} = \alpha_j + \mathbf{X}_i\beta + \zeta_{t(i),j} + \eta_{r(i),j} + \epsilon_{i,j} \tag{3.2}$$

The indicator variable $\mathbb{1}$ takes the value one if individual i has a favorable opinion of the binary dependent variable j, i.e. *"pro free trade"*, *"pro TTIP"*, *"pro Protectionism"*, *"pro Globalization"*. It is a function of a constant α, a k-dimensional vector of explanatory variables X_i, time and region fixed-effects $\zeta_{t(i)}$ and $\eta_{r(i)}$, respectively, and an error term denoted by ϵ_i. The regression coefficients of interest are comprised in the vector β. As robustness checks, we estimate the same model applying standard non-linear models (Probit, Ordered Logit[18]).

As stated earlier, we also aim at identifying, among others, macroeconomic performance variables that are able to explain the large variance across regions. Analogously to our approach to individual attitudes, we distinguish between ideological and macroeconomic drivers. Without a national/regional utility function, a statement on rationality can hardly be made. However, individual rationales (e.g. the effect of age) should also be applicable to the analysis at the regional level; this follows by the aggregation of preferences. Thus, we investigate which regional characteristics shape the average preference at the regional level. For this purpose, we also examine region fixed-effects $\eta_{r(i)}$ for all variables of interest. This approach allows us to estimate conditional regional averages after controlling for all individual characteristics. We estimate the model:

$$\eta_{r(i),j} = \alpha_j + \mathbf{Z}_r\gamma + \eta_{c(r)} + u_{r,j} \tag{3.3}$$

The conditional approval rate $\eta_{r(i)}$ for policy j in region r is a function of some constant α, a vector of regional characteristics Z, country fixed-effects denoted by η and an error term u. We are interested in estimated coefficients of vector γ and their contribution to overall fit of the model.

3.3.2 Hypotheses for Individual Preferences

A variety of characteristics shapes individual preferences for open-market policies. We classify variables representing economic self-interest, if a direct link between a certain policy and an individual economic outcome can be established. According to classical

[18] Section 3.2 on our data explain that four of dependent variables are categorical.

trade theory, occupation variables are thought to explain individual gains from trade. As the agricultural sector in the EU is highly protected, an opening of this market is likely to result in losses. Of course, these direct job linkages outweigh indirect effects (price reductions, higher number of available varieties, general equilibrium effects); aggregate gains from trade have to be taken into consideration and typically exceed losses. Whereas gains are widespread, individual losses (e.g. job loss) are much more concentrated. Asymmetry in outcomes is one reason why promoting free trade is not straight-forward.

Another matter that is closely linked to occupation variables is human capital, i.e. education. In general, higher education is linked to labor market success. A high endowment with human capital would also lower costs from sector-reallocation in response to trade liberalization. These trade adjustment costs result from, a.o., retraining, temporary unemployment, job search, or relocation. Considering them as fixed costs, younger individuals should be more likely be in favor of open-market policies as the related costs are distributed over longer life time cycle. Hence, we conjecture a decline for open-market attitudes in age.

The above-stated hypotheses can be categorized as attitudes following economic self-interest. However, as we show later, "soft determinants" play a more important role in shaping individual preferences. The EB provides detailed information on the survey participants' ideology and beliefs. For instance, respondents are questioned concerning their trust in different national and EU institutions. Without doubt, these soft determinants function either way. However, there are good reasons why trust matters: if trade liberalization is administered in a way that the winners compensate the losers, support for such policies should increase in the reported level of trust. Moreover, trust in the EU which exclusively responsible for the EU's foreign trade and competition politics is essential for individual preferences (Pitlik, 2016).

The available data allow for a classification of the participants on a standard political left-right scale; one would expect that right-wing individuals to support trade liberalization, free trade and TTIP. Following the Rodrik Trilemma, right-wing individuals are more likely to favor sovereignty which, however, counteracts free trade. We expect left-wing individuals to favor equality and thus to have lower preferences for open-market policies as these typically involve increases in national inequality (Zhu and Trefler, 2005).

Grossman and Helpman (2018) theorize that belonging to a certain social group can determine free trade attitudes beyond individual outcomes if the status of the social group is affected by trade policies. The working class, which is threatened by import competition relatively more than higher social classes, should show less support for open-market politics. Personal well-being, measured in terms of life satisfaction, serves as a

control variable to factor in whether survey participants generally provide more positive or negative answers.

3.3.3 Hypotheses for Regional Preferences

Let us think about Dani Rodrik's idea of social preferences for the three objectives (sovereignty, democracy, economic integration) in the following way: assuming that democracy constitutes the preferred from of governance in western societies, we reduce the Trilemma to a two-dimensional trade-off by eliminating the democracy dimension. This is represented by Figure 3.14 in the Appendix. The abscissa of the diagram shows the degree of international economic integration. The ordinate illustrates a utility/cost scale. Increasing international economic integration leads to higher consumption possibilities but comes at the cost of a loss in legislative autonomy. Optimality requires that marginal utility of consumption equals marginal cost of giving up sovereignty. B realizes the optimal level of international economic integration; any chosen form of integration to the left of B (think of North Korea in extremis) is inferior and economic integration would generate net gains. C reflects a situation of over-integration: eventually, Brexit supporters have located the United Kingdom to the right of an optimal degree of integration. This brief exercise demonstrates that GDP maximization does not sufficiently describe the optimal degree of international integration. We conjecture that public support for open-market policies is higher in poorer regions and countries.

Unemployment can affect public opinion about open-markets via two opposing channels: people from regions which experience high unemployment rates could blame this fact on globalization; this is the case when attitudes are shaped by looking back. Consequently, open-market policies are opposed. Contrarily, individuals from those regions could also be in favor of trade liberalization if open markets are considered as a chance to catch up; in this case, people's attitudes are shaped by looking forward. Hence, the direction of the effect is ex ante ambiguous. The effect of EU regional transfers, however, should be unambiguous: the amount of EU structural funds should weaken negative trade adjustment costs and thus increase support for open-market attitudes. As EU structural funds are not assigned randomly but depend on the GDP level, a useful estimation requires the inclusion of the GDP level. Recent research examines changes in import-exposure measures in order to assess the impact of globalization on regions. We assume that higher import-exposure materializes in less support for open-markets. Higher export-exposure, by contrast, should have the opposite effect. All other variables included in the regional preference regressions follow a similar pattern as the variables that are used to estimate

individual preferences.

3.4 Discussion of Results

The subsequent section presents our main findings with respect to the above-stated hypotheses. For the sake of clarity, we present the results for individual (Subsection 3.4.1), and regional attitudes (Subsection 3.4.2) separately.

3.4.1 Individual Attitudes

Baseline

Explaining how individual attitudes towards open-market policies are shaped, we classify four sets of explanatory variables. The first set includes variables informing about people's trust in certain institutions. The second set of variables provides information on individual ideology and political stance; the third contains socio-economic characteristics that might shape attitudes towards open-market policies, e.g. social class, age, gender, education and occupation. These sets of variables are shown in descending order with respect to their contribution in explaining individual attitudes. Our baseline specification in Table 3.3 also comprises an interaction of region and time fixed effects.

Table 3.3 shows the determinants of individual attitudes towards the 5 dependent variables. The first set, trust in institutions, reveals our first main finding: trust in institutions is a very dominant driver of individual attitudes. In particular, "Trust in the EU" impacts open-market attitudes between 12 and 19 percent; protectionism, a policy area for which the EU is exclusively responsible is less affected. Certainly, a causal relation could work in both direction, e.g. individuals who are in favor of closed economies may have less trust in institutions which traditionally support international economic liberalization. However, it is worth keeping in mind that the new anti-free trade movement is not an isolated phenomenon but is associated to a more general trust crisis.

The second set of independent variables includes measures that account for individual ideology and political stance. Being politically more informed cannot be clearly attributed to more positive or negative open-market attitudes. The negative sign for TTIP, despite a small magnitude (-0.5 percentage points), is consistent with our perception of a biased public debate about TTIP, i.e. an anti-TTIP campaign that became visible in some countries.[19] We discuss these country-specific campaigning effects below. For the

[19] Interestingly and in line with Pascal Lamy's proclamation of the new world of trade, these campaigns focused mainly on precaution related issues and circumvent standard arguments for protectionism (job losses in certain industries).

interpretation of the variables on political stance, please note that the group "center" is left out due to multicollinearity. Hence, all coefficients need to be interpreted relative to centrist preferences. In line with our priors, leftists are less likely to approve TTIP by around 9 percentage points. The effects on attitudes towards free trade and the globalization point in the same direction, even if the magnitudes become slightly smaller. Moving along the political spectrum to the right, support for open-markets is u-shaped. It increases to the center-right and declines for far right. This might be due to distinct preferences for national autarky. The results for protectionism are particularly striking: leftists and center-leftists tend to disapprove protectionism. This is at odds with our priors, as typically left-wing parties tend to favor protectionist measures. The effect of political stance is shown graphically in Figure 3.3. Overall, ideological variables seem to follow expected pattern.

Life satisfaction is positively correlated to all outcome variables. In the first place, a clear economic relationship between life satisfaction and open-market attitudes may not be obvious. However, from a behavioral perspective, happier individuals tend to give more positive answers in general, no matter the which topic. To eliminate this bias, we include the life satisfaction. It increases the likelihood of positive answers in our baseline specification by 2.9 to 4.5 percentage points. Including a variable for education[20] shows negative effects on the outcome variables, two of which are statistically significant. Mean education time is 19.4 years and its standard deviation yields 5.1 years; one standard deviation increase in education decreases the support for TTIP, ceteris paribus, by 1 percentage point. High skilled individuals are typically considered to adjust more easily to trade shocks, while low-skilled workers might suffer relatively more. The opposite result is another indication that the political economy of trade has changed, and that open-market attitudes cannot sufficiently be explained economically.

There is no gender specific deviation with respect to TTIP attitudes. However, male and female respondents show different preferences for free trade and protectionism. Except for their image of globalization, men's support of open markets rates higher than women's. As for the effect of age on the outcome variables, we allow for non-linearity; this is discussed in more detail later. Social class is categorical, has five realizations[21] and increases in the status of the self-reported class. Accordingly, the difference in support between the highest and the lowest class equals five times the reported coefficient. An increase in social class goes along with an increase in the probability of being in favor of open markets: TTIP increases by 0.8 percentage points at the margin, free trade by 1.2, protectionism

[20] This variable provides information on the age of respondents when finishing their education. Thus, it increases in the level of education.

[21] Working class, lower middle class, middle class, upper middle class, and higher class.

decreases by 1 percentage point (not statistically significant), and globalization attitudes increase by 1.9 and 1.7 percentage points, respectively. Living in rural regions has no effect on attitudes towards TTIP, protectionism, and the image of globalization, but entails a slightly negative impact on the approval of free trade and the globalization opportunity variable. According to our estimates, occupation is a poor predictor for the support of to open-market policies. We can identify a negative effect for farmers and fishermen on TTIP (-6.3 percentage points) and globalization as an opportunity for economic growth (-2.9 percentage points), no effect of being self-employed on any of the variables, and a substantially higher support for protectionism among blue collar workers (4.4 percentage points). White collar workers do not show any differences in their preferences, and unemployed individuals show significantly lower approval rates for free trade, and globalization as opportunity for economic growth. Note that the reference group consists of inactive individuals, i.e. students and retired persons). Similar to the occupation variables, other variables that are available in the Eurobarometer survey have no effect on the individual attitudes. These include, amongst others, information on private wealth.

Table 3.3: Individual Open-Market Attitudes

	TTIP		Free Trade		Protectionism		Glob. Opportunity		Glob. Image	
	(1)		(2)		(3)		(4)		(5)	
Trust European Union	14.76***	(1.38)	12.04***	(1.19)	5.33***	(1.03)	18.94***	(1.47)	18.20***	(1.08)
Trust Political Parties	0.77	(1.11)	0.96	(0.64)	8.00***	(1.58)	1.83***	(0.56)	7.70***	(0.98)
Trust Nat. Government	2.38*	(1.25)	3.49***	(0.70)	2.43*	(1.37)	3.25***	(0.72)	3.02***	(1.00)
Trust Nat. Parliament	0.18	(0.85)	2.13***	(0.57)	2.71**	(1.14)	2.12***	(0.56)	2.68***	(0.82)
Political Interest	-0.51*	(0.29)	0.25	(0.30)	-0.98*	(0.48)	0.69**	(0.26)	0.13	(0.33)
Left	-9.30***	(1.83)	-8.17***	(1.39)	-2.75*	(1.48)	-4.87***	(1.05)	-3.56**	(1.35)
Center-Left	-5.10***	(1.00)	-3.65***	(0.80)	-4.64***	(0.89)	-2.55***	(0.60)	-3.40***	(0.65)
Center-Right	2.43**	(0.89)	1.59***	(0.56)	-1.36	(0.83)	-0.86	(1.00)	-1.09	(0.88)
Right	0.72	(1.52)	-0.91	(0.93)	2.08	(1.26)	-2.83**	(1.32)	-0.32	(1.36)
Life Satisfaction	2.90***	(0.42)	3.88***	(0.45)	2.19***	(0.62)	4.41***	(0.32)	4.46***	(0.47)
Education (finish age)	-0.17***	(0.05)	-0.06	(0.05)	-0.52***	(0.11)	-0.00	(0.03)	-0.09	(0.07)
Male	0.51	(0.72)	1.88***	(0.34)	-4.75***	(0.91)	0.22	(0.49)	-0.96*	(0.49)
Age	-0.19**	(0.07)	-0.28***	(0.08)	-1.06***	(0.12)	-0.40***	(0.08)	-0.92***	(0.12)
Age squared x 100	0.14**	(0.06)	0.20***	(0.07)	0.79***	(0.12)	0.25***	(0.08)	0.69***	(0.11)
Social Class	0.83**	(0.33)	1.24***	(0.38)	-0.96	(0.73)	1.91***	(0.40)	1.70***	(0.38)
Rural	0.39	(0.74)	-0.97	(0.66)	-0.16	(0.81)	-0.82	(0.52)	-0.98	(0.72)
Farmer and Fisherman	-6.33***	(2.23)	-2.46	(2.78)	0.79	(3.12)	-2.87*	(1.41)	-1.85	(2.11)
Self-Employed	-0.64	(0.65)	1.37	(0.99)	-1.47	(1.18)	-0.54	(0.85)	0.54	(0.81)
Blue Collar Worker	0.64	(0.59)	-0.17	(0.40)	4.45***	(1.11)	0.17	(0.56)	0.34	(0.67)
White Collar Worker	0.86	(0.51)	0.21	(0.87)	-0.88	(0.82)	0.18	(0.56)	0.59	(0.74)
Unemployed	-1.18	(0.72)	-1.70**	(0.69)	-0.56	(1.17)	-1.52*	(0.75)	-0.12	(0.75)
Observations	92,664		64,640		42,009		92,666		61,745	
R^2	0.19		0.13		0.16		0.19		0.18	

Source: Eurobarometer, 2017. Own calculations.

Note: Ordinary least square estimates, standard errors in parentheses. All specifications include region-time fixed-effects. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

This correlation exercise exemplifies that determinants beyond economic self-interest shape preferences for open-market policies. Thus, the data support Lamy's (2015) and Rodrik's (1998) description of attitudes: if in the new world of trade, precaution—and not protection—is for sale, it is not far-fetched that trust in the relevant institutions matters much more than individual labor market outcomes. At the same time, higher education and high-paid jobs do not strengthen open-market attitudes indicating that potential winners in economic terms prefer non-economic objectives over additional income. Our findings illustrate that the classical antagonism between left and right cannot consistently explain attitudes towards open-markets at the individual level. Clearly, even the inclusion of a very rich set of explanatory variables that covers various potential channels determining open-market sentiments cannot explain individual preferences comprehensively. This is reflected by R-Square statistics below 20 percent. An explanation for the weak performance of our model might be arbitrariness, or simply a misunderstanding of the survey questions by the participants. Related literature shows that surveys participants tend to favor center responses rather than extremes. This is often referred to as central tendency bias.[22] Accordingly, the next subsection focuses on strong preferences which allows us to better predict individual attitudes.

Strong Preferences

For the sake of a clear notation, we consider individuals having strong preferences if they are either *very much in favor* or *very much against* certain politics. Hence, we restrict our analysis on a sub-sample of answers. In doing so, we lose the question on TTIP, which is non-categorical. Results are shown in Table 3.4. The fit of the model increases quite substantially up to more than 45 percent. Accordingly, most of the reported coefficients increase in absolute values. It is striking that occupation variables do not carry much weight here as well. Altogether, we do not find evidence that classical trade theory provides a useful frame of reference for the political economy of trade.

[22] For an overview on the effects of central tendency bias and related literature cf. Allred et al. (2016).

Table 3.4: Individual Open-Market Attitudes – strong preferences

	Free Trade		Protectionism		Glob. Opportunity		Glob. Image	
	(1)		(2)		(3)		(4)	
Trust European Union	14.83***	(2.17)	5.84***	(1.54)	27.60***	(3.36)	25.27***	(2.40)
Trust Political Parties	1.38	(1.24)	11.68***	(2.76)	1.38	(1.27)	9.76***	(1.77)
Trust Nat. Government	4.45***	(1.44)	2.67	(1.86)	4.20**	(1.57)	6.54***	(2.13)
Trust Nat. Parliament	2.19*	(1.08)	3.13	(1.86)	3.95***	(0.98)	3.76**	(1.67)
Political Interest	0.86*	(0.44)	-0.62	(0.55)	1.05***	(0.32)	0.45	(0.48)
Left	-10.53***	(2.47)	-1.71	(1.98)	-5.51***	(1.40)	-5.02***	(1.63)
Center-Left	-3.41***	(1.12)	-2.82*	(1.40)	-2.67***	(0.94)	-3.21**	(1.42)
Center-Right	1.63*	(0.80)	-2.03	(1.28)	-0.00	(1.57)	-0.46	(1.65)
Right	-2.58	(1.75)	1.73	(1.71)	-2.45	(2.13)	-0.39	(1.97)
Life Satisfaction	4.11***	(0.75)	1.55*	(0.83)	5.37***	(0.58)	4.73***	(0.98)
Education (finish age)	-0.18*	(0.09)	-0.55***	(0.14)	0.09*	(0.05)	-0.06	(0.12)
Male	1.56**	(0.64)	-5.58***	(1.56)	1.49**	(0.71)	-0.84	(0.71)
Age	-0.42***	(0.12)	-1.18***	(0.25)	-0.51***	(0.14)	-1.14***	(0.17)
Age squared x 100	0.33***	(0.11)	0.82***	(0.22)	0.35**	(0.13)	0.84***	(0.17)
Social Class	2.19***	(0.50)	-0.17	(0.96)	2.73***	(0.39)	1.99**	(0.74)
Rural	-0.47	(1.48)	0.02	(1.62)	-1.01	(0.74)	0.19	(1.20)
Farmer and Fisherman	-10.00**	(3.82)	-1.89	(4.28)	-2.62	(3.24)	-0.77	(3.56)
Self-Employed	2.80*	(1.50)	-1.13	(1.78)	0.00	(1.31)	-0.71	(1.36)
Blue Collar Worker	-0.41	(0.74)	3.03*	(1.57)	-0.50	(0.67)	0.71	(1.19)
White Collar Worker	1.33	(1.37)	-1.64	(1.60)	1.14	(0.75)	1.48	(1.39)
Unemployed	-1.09	(1.53)	-2.46	(1.67)	-0.54	(1.40)	0.51	(1.61)
Observations	16,020		11,303		25,351		13,298	
R^2	0.32		0.39		0.45		0.47	

Source: Eurobarometer, 2017. Own calculations.

Note: Note: Ordinary least square estimates, standard errors in parentheses. All specifications include region-time fixed-effects. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val.<0.05, and p-val. < 0.1.

The Effect of Political Stance

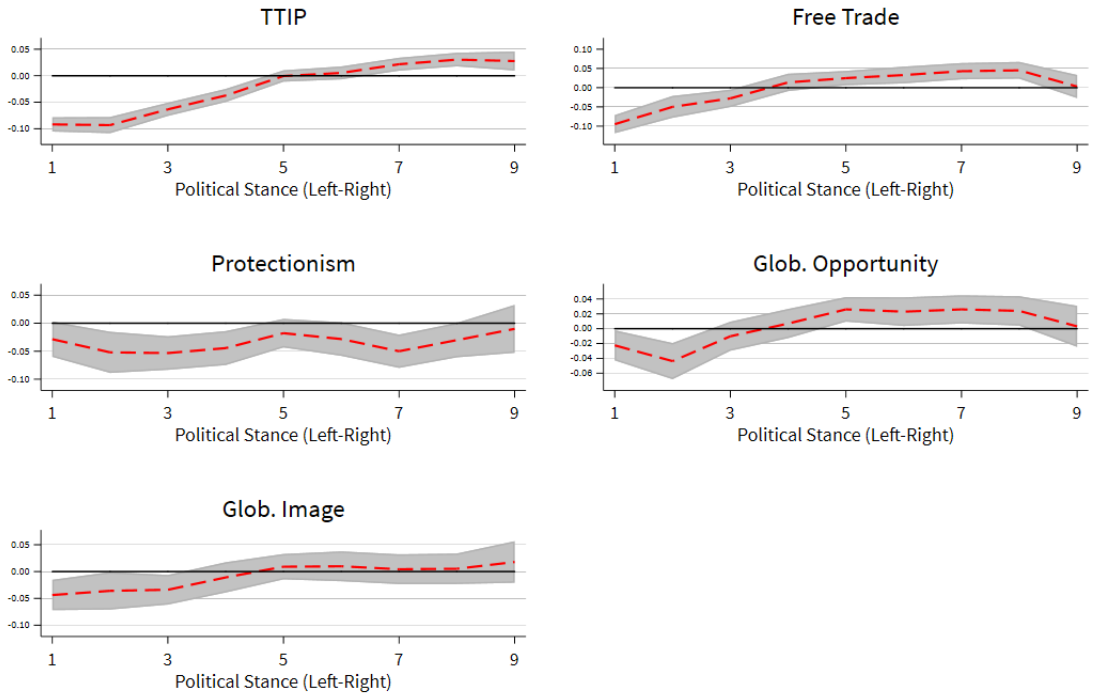
For the following, we extend the specification shown in Table 3.4:[23] survey respondents can locate themselves on a left-right scale (1 to 10), for which we estimate different coefficients. Due to multi-collinearity, the 10^{th} regressor is left out and serves as reference point. Coefficients need to be interpreted relative to this (far-right) group. The results are graphically illustrated in Figure 3.3.

We observe distinct differences for left and right individuals with respect to TTIP and free trade with increasing support for these policies. As for protectionism and globalization attitudes, ideological stance shows no systematic pattern that allows us to draw

[23] For the effect of political stance on attitudes towards TTIP, we employ the specification as shown in Table 3.3.

conclusions. Thus, we deduce that the typical left-right antagonism plays only a minor role in explaining individual open-market attitudes.

Figure 3.3: The Effect of Political Ideology on Open-Market Attitudes



Source: Eurobarometer, 2017. Own illustration.

Note: The figure illustrates the effect of political stance on a scale between 1 (very left) and 10 (very right) on the the five variables of interest. Category 10 is left out for multicollinearity reasons. Regressions are specified as in Table 3.3 and 3.4.

The Effect of Political Interest

Political interest is a variable that accounts for self-reported interest in and knowledge about political issues. The variable is categorical and has for realizations. From this variable, we can deduct how individual attitudes are determined in the context of national public debates. If—all else equal—politically more informed individuals report above-average approval rates of TTIP in country A and below-average approval rates in country B, we can identify certain country-specific narratives surrounding our outcome variables. Hence, we interact political interest with country fixed-effects. Apart from that, estimations are specified as in Table 3.4.[24]

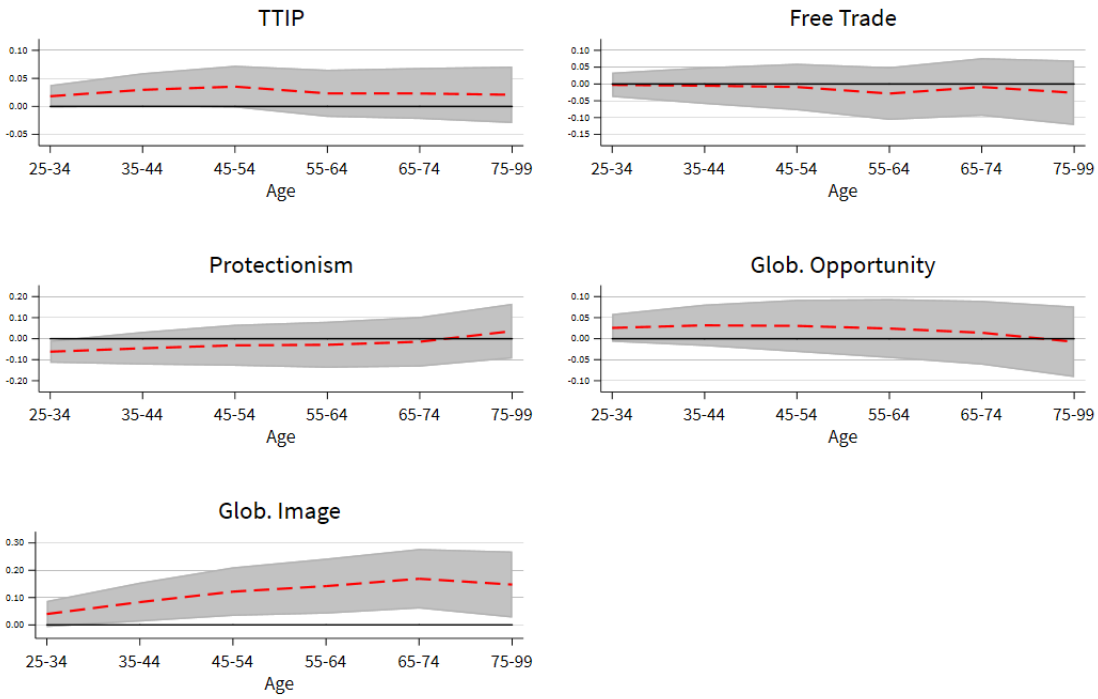
[24] For TTIP, we use the specification as shown in Table 3.3.

Results of this exercise are shown in the Appendix (Figures 3.9–3.13). Note that for the sake of clarity, significant coefficients are marked colored. With respect to TTIP, the most negative narratives are found in the Netherlands, Germany, Luxembourg, Spain, Sweden and Slovakia. In Italy, Greece, Cyprus and most of the eastern European Member States, politically more informed individuals approve free trade significantly more. In Italy and Bulgaria, increasing political interest is also related to higher approval rates for protectionism. Globalization is seen as an opportunity for economic growth particularly among politically informed individuals in Luxembourg and Northern Ireland. Political knowledge increases favorable opinions about globalization in only half of the EU's Member States. This provides evidence for the presence of country-specific debates on open-market policies. Positive open-market attitudes dominate public debates primarily in northern and eastern European countries whereas the opposite holds true for central European and Mediterranean countries.

The Effect of Age

Tables 3.3 and 3.4 indicate an inverted u-shape relationship between age and open-market attitudes. This non-linearity is best illustrated graphically. Figure 3.4 shows different age effects for different age groups. Except for the globalization image, age effects are statistically not significantly different from those of the reference group (age 15-24). Thus, we reject the non-linearity hypothesis and interpret our results in favor of Lamy's (2015) argument (*sale of precaution*): if individuals care about consumer protection (and not individual labor market outcome as our results suggest), there is no variation in the effect of age on open-market policies to be expected. the concept image concerning globalization constitutes the "broadest" question and does not address a concrete policy but a general attitude towards globalization. Surprisingly, a skeptical rethinking of globalization is prevalent among younger individuals.

Figure 3.4: The Effect of Age on Open-Market Attitudes



Source: Eurobarometer, 2017. Own illustration.

Note: The figure illustrates the effect of age groups on the the five variables of interest. The youngest group (15-24) is left out for multicollinearity reasons. Regressions are specified as in Table 3.3 and 3.4.

R-Squared Decomposition

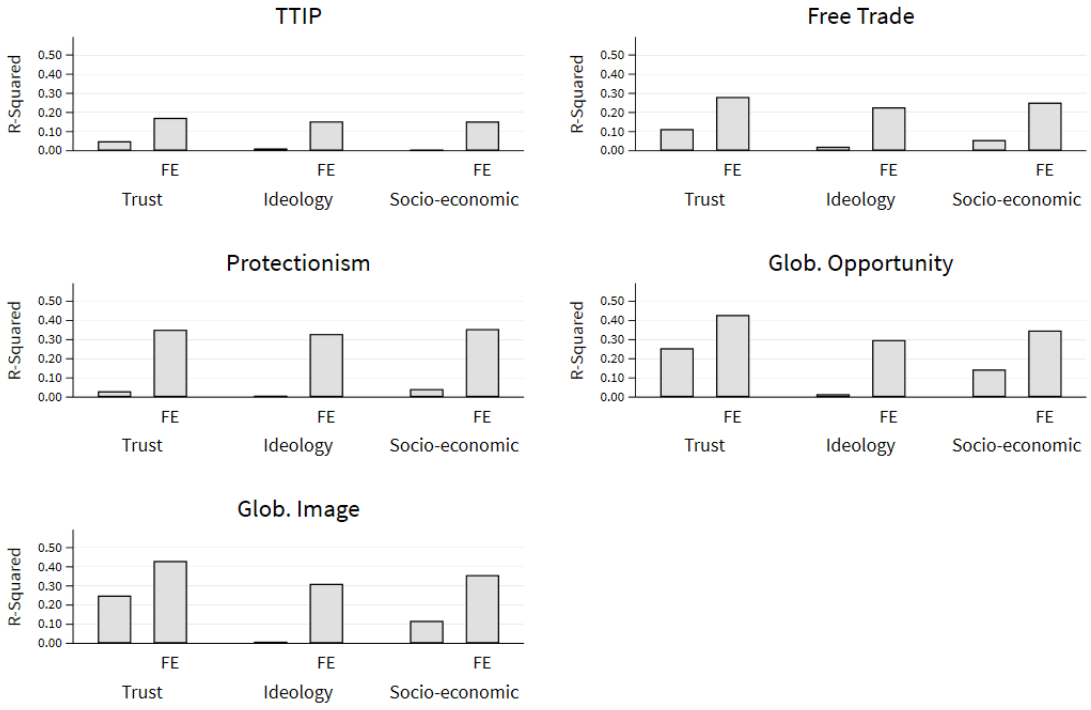
To better illustrate the share of variance that is explained by different sets of explanatory variables, we graphically show their contribution to the R-Squared statistics. The estimations follow the structure of Table 3.4.[25] For all independent variables, regressions with and without region-time fixed effects are shown. It stands out that a relatively large share of variance is accounted for by fixed-effects.

The inclusion of trust variables leads to a higher increase in the model fit than the inclusion of the political ideology variables and the socio-economic characteristics. The only exception is protectionism; in this case the overall fit of the model highly depends on region-time fixed-effects. Ideology does not seem to play an important role for any of the variables of interest. Socio-economic determinants have some impact particularly on globalization attitudes. For those the overall fit of the model is highest and trust variables

[25] For TTIP, we use the specification as shown in Table 3.3.

alone explain up 25 percent of the total variance. Therefore, even if effects of ideology and some other variables points towards the expected directions, their contribution to an explanation of open-market attitudes is negligible.

Figure 3.5: R-Squared Contribution



Source: Eurobarometer, 2017. Own illustration.

Note: The figure shows R-Squared statistics based on results from Table 3.3 and 3.4. The bars indicate the explanatory power of the respective set of independent variables. FE specifications include region-time fixed effects.

Robustness Checks

In order to provide evidence that our findings remain qualitatively unchanged when applying a different model, we run our baseline specification also using Probit and Ordered Logit models. In the latter, the outcome variables include all four realizations as discussed in Section 3.2. The results are summarized in Table 3.8 and 3.9. Given the non-linear structure of Probit and logistic regressions, a comparison of coefficients is not straight-forward. Nonetheless, both models support all findings from the linear specifications. Coefficients point in the same direction, their magnitudes remain relative to other coefficients roughly the same, and the effects are robust with respect to statistical significance.

3.4.2 Attitudes across European Regions

Individual attitudes may be shaped not only by respondents' personal experiences with open-market policies; they may also be based on a region's overall experience with economic shocks. This does not necessarily require altruistic preferences but can be justified by some sort of self-interest: regions facing high import competition might fall behind, the regional population could shrink, which in turn causes a lower provision of public goods. Hence, a person even if not negatively affected by an import shock directly is still subject to the indirect consequences.

Section 3.2 already stresses the importance of country and region fixed-effects. More specifically, we highlight that large heterogeneity between geographical units is present for all outcome variables. This sub-section aims at abstracting from individual preferences and shifting the focus towards the variance across European regions. Please note that as described in Section 3.3, we estimate the fixed-effect coefficients that result from individual regressions. Hence, we estimate conditional regional averages. Our final sample comprises 247 regions but we have to exclude 5 regions due to missing values in a covariate (change in population). Regressions that include the shift-share instrument on trade exposure contain less observation as this data is only available for EU15 Member States. The shift-share measure also takes into account changes in trade exposure due to the EU eastern enlargement. Table 3.5 shows summary statistics of the coefficients which are pre-multiplied with 100 percent.

Table 3.5: Summery Statistics: Region Fixed-Effects

	Observations	Mean	Standard Deviation	Minimum	Maximum
TTIP	247	66.5	16.7	5.8	96.7
Free Trade	247	76.3	10.8	39	100
Protectionism	247	44.9	16.4	0	100
Glob. Opportunity	247	66.1	13.8	17.1	93.3
Glob. Image	247	51.9	14	10.9	85.6

Source: Eurobarometer, 2017. Own calculations.

Note: The table shows the coefficients of region fixed-effects following our baseline estimation according to estimation 3.2. The region, in which all individuals have a positive view on protectionism is Cantabria, in the north of Spain. In Zadar and Dubrovnik (both Croatia), all respondents are against protectionism and pro free trade, respectively.

Table 3.6 shows the results when regressing conditional regional approval rates for TTIP on the aforementioned covariates (Column 1). Results of Column 2 and 4 include country fixed-effects. In specification 3 and 4, the shift-share measures for import and net-import exposure are included. Column 5 to 12 repeat the results when repeating this exercise for free trade and protectionism. Table 3.7 does the same for the globalization variables.

Again, it is trust variables that matter the most: a one percentage point increase in average trust in the EU generates 0.43 percentage points higher TTIP approval rates (Column 2). Trust in the EU has a positive effect on four pro open-market attitudes (there is no effect on protectionism). Trust in national institutions has sizable effects on pro open-market preferences as well. Unemployment merely has a positive effect on TTIP and protectionism and only in specifications without fixed-effects. This might indicate low within-country variation in unemployment rates. The effect is larger for western European countries. Income level has no significant effects in most of the specifications. For western European countries (Column 3, 4, 7, and 8 in Table 3.7) higher income is positively associated with a more positive attitude towards globalization. Effects of population change over the last 15 years are not very robust. Obviously, distance to Brussels does not vary heavily within EU Member States; hence, it does not come as surprise that we do not find a significant effect in the fixed-effect specifications. However, the farther away from Brussels (in 100 kilometers), the larger is the support for TTIP, free trade, protectionism, and globalization. The effect of median age is not entirely clear, the sign flips (negative effects on TTIP, positive effects on free trade). The effects of trade exposure apply to western European countries only and disappear once country fixed-effects are included. It stands out that import exposure lowers approval rates of all five outcome variables. In the case of protectionism this is puzzling. We do not include EU regional transfers in the regressions as it would further reduce the number of observations by 37 regions. Effects of regional transfers are statistically not distinguishable from zero.

Table 3.6: Open-Market Attitudes 1/2

	TTIP				Free Trade				Protectionism			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trust in National Institutions	-0.28*	-0.10	0.02	0.01	0.23*	-0.18	0.69***	-0.41	-0.26*	0.05	-0.40*	0.08
	(0.15)	(0.26)	(0.29)	(0.28)	(0.13)	(0.28)	(0.24)	(0.36)	(0.16)	(0.38)	(0.22)	(0.48)
Trust in EU	0.52***	0.42***	0.55***	0.40**	0.26***	0.27***	0.12	0.37***	0.14	0.19	0.32**	0.25
	(0.09)	(0.09)	(0.18)	(0.16)	(0.06)	(0.07)	(0.11)	(0.13)	(0.08)	(0.13)	(0.13)	(0.22)
Unemployment	0.31	-0.22	0.77**	-0.29	-0.01	0.39	0.26	-0.05	0.50**	0.31	0.81***	0.81*
	(0.20)	(0.24)	(0.36)	(0.27)	(0.15)	(0.25)	(0.25)	(0.25)	(0.23)	(0.40)	(0.29)	(0.46)
Ln GDP per capita (PPP)	1.06	-1.04	-1.83	-0.04	-0.13	-1.03	0.43	-0.11	1.82**	1.75	-0.76	-0.27
	(0.69)	(0.67)	(1.30)	(0.95)	(0.57)	(0.70)	(1.17)	(1.01)	(0.74)	(1.22)	(1.06)	(1.55)
Δ population	-1.88	0.89	5.32	-0.56	-0.52	3.57*	3.14	2.32	8.13***	1.92	4.96	1.22
	(1.54)	(1.88)	(3.50)	(2.47)	(1.20)	(1.85)	(3.18)	(2.59)	(1.79)	(2.52)	(3.50)	(3.03)
Distance to Brussels	0.65***	0.01	-0.26	0.16	0.26*	0.15	-0.07	0.47	0.75***	-0.18	-0.18	0.22
	(0.18)	(0.26)	(0.36)	(0.34)	(0.14)	(0.29)	(0.25)	(0.36)	(0.21)	(0.35)	(0.35)	(0.51)
Median Age	-1.54***	0.66	-0.35	0.86*	-0.33	1.18**	-0.03	0.65	0.82*	0.94	0.35	1.16*
	(0.37)	(0.40)	(0.60)	(0.44)	(0.29)	(0.49)	(0.55)	(0.44)	(0.47)	(0.63)	(0.60)	(0.69)
Δ Import Exposure			-1.03***	0.69			-0.61**	1.01**			-0.72**	0.33
			(0.26)	(0.58)			(0.27)	(0.48)			(0.36)	(0.60)
Δ Net-Import Exposure			0.77*	0.26			0.15	0.13			0.49**	0.45**
			(0.44)	(0.36)			(0.23)	(0.18)			(0.23)	(0.22)
Observations	242	242	134	134	242	242	134	134	242	242	134	134
R^2	0.40	0.83	0.36	0.87	0.20	0.64	0.26	0.71	0.23	0.63	0.44	0.67
Country FE		✔		✔		✔		✔		✔		✔

Source: Eurobarometer, 2017. Badinger and Reuter (2017). Own calculations.

Note: Ordinary least square estimates, heteroskedasticity robust standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val. < 0.1.

Table 3.7: Regional Open-Market Attitudes 2/2

	Glob. Opportunity				Glob. Image			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust in National Institutions	0.70***	-0.06	0.96***	-0.26	0.60***	0.06	0.69***	-0.44
	(0.13)	(0.26)	(0.23)	(0.33)	(0.12)	(0.29)	(0.23)	(0.40)
Trust in EU	0.47***	0.43***	0.35***	0.38**	0.52***	0.52***	0.56***	0.66***
	(0.07)	(0.09)	(0.11)	(0.19)	(0.07)	(0.10)	(0.13)	(0.23)
Unemployment	0.10	0.35	-0.19	-0.23	0.12	0.62**	-0.18	0.33
	(0.18)	(0.24)	(0.25)	(0.23)	(0.19)	(0.29)	(0.28)	(0.35)
Ln GDP per capita (PPP)	-0.11	-0.08	1.95*	2.11**	0.80	0.46	1.50	2.32*
	(0.62)	(0.81)	(1.12)	(1.05)	(0.58)	(0.90)	(1.01)	(1.23)
Δ population	0.60	0.83	5.30	3.33	2.96**	1.58	5.95*	3.11
	(1.39)	(1.75)	(3.35)	(2.26)	(1.31)	(1.89)	(3.13)	(2.77)
Distance to Brussels	-0.19	0.25	-0.24	0.20	0.44***	0.35	0.47	0.50
	(0.16)	(0.27)	(0.27)	(0.38)	(0.16)	(0.35)	(0.29)	(0.47)
Median Age	0.20	0.68	0.29	0.53	0.31	0.99**	0.39	1.08*
	(0.32)	(0.46)	(0.56)	(0.51)	(0.32)	(0.46)	(0.53)	(0.55)
Δ Import Exposure			-0.95***	0.79			-0.84***	0.78
			(0.26)	(0.65)			(0.21)	(0.73)
Δ Net-Import Exposure			0.08	0.17			0.12	0.37
			(0.24)	(0.30)			(0.17)	(0.28)
Observations	242	242	134	134	242	242	134	134
R^2	0.38	0.72	0.57	0.80	0.39	0.65	0.55	0.75
Country FE		✔		✔		✔		✔

Source: Eurobarometer, 2017. Badinger and Reuter (2017). Own calculations.

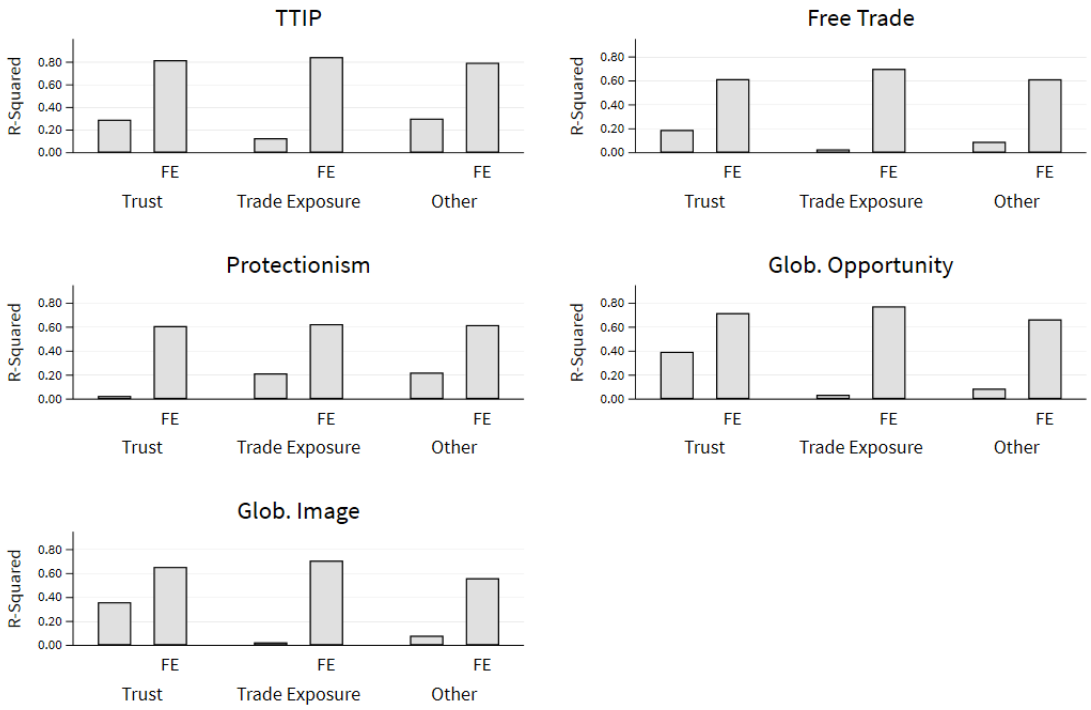
Note: Ordinary least square estimates, heteroskedasticity robust standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val.< 0.05, and p-val. < 0.1.

R-Squared Decomposition

This Subsection repeats the R-Squared decomposition for individual analysis. Estimations follow the structure of Table 3.6 and 3.7. For all specifications, regressions with and without country-fixed effects are shown. It is noteworthy that a relatively large share of variance is explained by the fixed-effects.

The average trust variables alone explain between 19 and 40 percent of the total variance; merely with respect to protectionism, trust has a negligible effect. By contrast, trade exposure matters for regional attitudes towards protectionism (22 percent); it has a smaller effect on TTIP (13 percent) and is irrelevant for the other open-market attitudes. The remaining covariates can explain TTIP (30 percent) and protectionism (22 percent) best.

Figure 3.6: R-Squared Contribution



Source: Eurobarometer, 2017. Badinger and Reuter (2017). Own illustration.

Note: The figure shows R-Squared statistics based on results from Table 6 and 7. The bars indicate the explanatory power of the respective set of independent variables. FE specifications include country fixed-effects.

3.5 Concluding Remarks

This chapter shows that the political economy of globalization is predominantly driven by determinants which go beyond economic self-interest. To the best of my knowledge, it is the first that systematically examines free trade attitudes in EU Member States based on Eurobarometer survey data. The *new world of trade* (Lamy, 2015) is characterized by distinct individual preferences that do not follow classical economic theory and traditional patterns. In fact, people often respond according to their self-interest but the explanatory power is very little. Criticism of globalization and open markets is a phenomenon that seems to be related to a general trust crisis. Trust in institution matters significantly for explaining free trade attitudes. Perhaps as long-term consequence of the 2008 Financial Crisis, individuals with little trust in institutions show lower approval for open-market policies. Our estimation model performs particularly well in predicting attitudes of individuals who express strong preferences.

This chapter expands the analysis of free trade attitudes also by a spatial dimension and finds that, at the regional level, higher import exposure typically leads to weaker preferences for open-markets, while the reverse effect of export exposure is smaller. Moreover, EU transfers do not impact attitudes. For all outcome variables, we find large cross-country heterogeneity which can only be partially explained by different national trade related public narratives.

Appendix Chapter 3

Table 3.8: Individual Open-Market Attitudes – Probit

	TTIP		Free Trade		Protectionism		Glob. Opportunity		Glob. Image	
	(1)		(2)		(3)		(4)		(5)	
Trust European Union	0.47***	(0.04)	0.45***	(0.04)	0.15***	(0.03)	0.60***	(0.03)	0.52***	(0.03)
Trust Political Parties	0.03	(0.04)	0.06***	(0.02)	0.23***	(0.05)	0.10***	(0.02)	0.25***	(0.03)
Trust Nat. Government	0.08**	(0.04)	0.15***	(0.03)	0.07*	(0.04)	0.11***	(0.02)	0.09***	(0.03)
Trust Nat. Parliament	0.00	(0.03)	0.08***	(0.02)	0.08**	(0.03)	0.07***	(0.02)	0.07***	(0.02)
Political Interest	-0.02	(0.01)	0.01	(0.01)	-0.03**	(0.01)	0.02**	(0.01)	0.00	(0.01)
Left	-0.29***	(0.05)	-0.28***	(0.05)	-0.08*	(0.04)	-0.16***	(0.03)	-0.11***	(0.04)
Center-Left	-0.16***	(0.03)	-0.14***	(0.03)	-0.13***	(0.02)	-0.08***	(0.02)	-0.10***	(0.02)
Center-Right	0.09***	(0.03)	0.08***	(0.03)	-0.04	(0.02)	-0.03	(0.03)	-0.03	(0.03)
Right	0.03	(0.05)	-0.02	(0.04)	0.07*	(0.04)	-0.09**	(0.04)	-0.01	(0.04)
Life Satisfaction	0.09***	(0.01)	0.13***	(0.02)	0.07***	(0.02)	0.13***	(0.01)	0.13***	(0.01)
Education (finish age)	-0.01***	(0.00)	-0.00	(0.00)	-0.02***	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Male	0.02	(0.02)	0.07***	(0.01)	-0.14***	(0.03)	0.01	(0.02)	-0.03**	(0.01)
Age	-0.01***	(0.00)	-0.01***	(0.00)	-0.03***	(0.00)	-0.01***	(0.00)	-0.03***	(0.00)
Age squared x 100	0.01***	(0.00)	0.01***	(0.00)	0.02***	(0.00)	0.01***	(0.00)	0.02***	(0.00)
Social Class	0.03**	(0.01)	0.04***	(0.01)	-0.03	(0.02)	0.06***	(0.01)	0.05***	(0.01)
Rural	0.01	(0.02)	-0.04	(0.02)	-0.00	(0.02)	-0.03*	(0.02)	-0.03	(0.02)
Farmer and Fisherman	-0.21***	(0.07)	-0.09	(0.10)	0.02	(0.09)	-0.10**	(0.05)	-0.07	(0.06)
Self-Employed	-0.02	(0.02)	0.05	(0.04)	-0.05	(0.03)	-0.02	(0.03)	0.02	(0.02)
Blue Collar Worker	0.02	(0.02)	-0.01	(0.01)	0.13***	(0.03)	0.00	(0.02)	0.01	(0.02)
White Collar Worker	0.03	(0.02)	0.01	(0.03)	-0.03	(0.02)	0.01	(0.02)	0.02	(0.02)
Unemployed	-0.04*	(0.02)	-0.06***	(0.02)	-0.02	(0.03)	-0.05**	(0.02)	-0.00	(0.02)
Observations	91,921		64,181		41,855		92,420		61,651	
Pseudo-R^2	0.15		0.12		0.12		0.16		0.15	

Source: Eurobarometer, 2017. Own calculations.

Note: Standard errors in parentheses. All specifications include region-time fixed-effects. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. $<$ 0.01, p-val. $<$ 0.05, and p-val. $<$ 0.1.

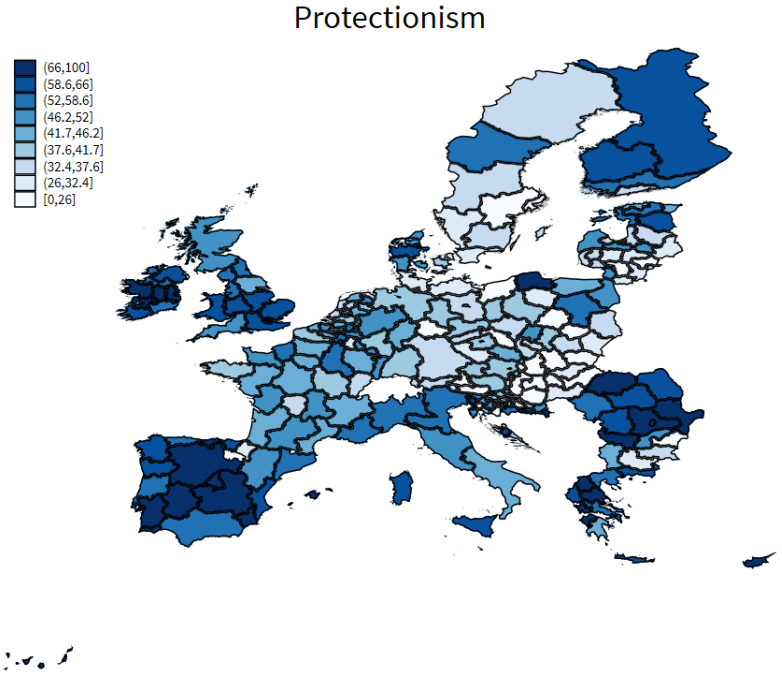
Table 3.9: Individual Open-Market Attitudes – Ordered Logit

	Free Trade		Protectionism		Glob. Opportunity		Glob. Image	
	(1)		(2)		(3)		(4)	
Trust European Union	0.62***	(0.06)	0.21***	(0.04)	0.80***	(0.05)	0.89***	(0.05)
Trust Political Parties	0.10***	(0.03)	0.36***	(0.07)	0.37***	(0.04)	0.15***	(0.03)
Trust Nat. Government	0.18***	(0.06)	0.10*	(0.06)	0.14***	(0.05)	0.13***	(0.05)
Trust Nat. Parliament	0.07*	(0.04)	0.12**	(0.05)	0.09**	(0.04)	0.11***	(0.04)
Political Interest	0.05***	(0.02)	-0.04**	(0.02)	0.00	(0.01)	0.05***	(0.01)
Left	-0.34***	(0.07)	-0.09	(0.06)	-0.19***	(0.06)	-0.21***	(0.06)
Center-Left	-0.17***	(0.04)	-0.17***	(0.04)	-0.15***	(0.03)	-0.11***	(0.03)
Center-Right	0.20***	(0.06)	-0.06	(0.04)	-0.03	(0.04)	-0.00	(0.05)
Right	0.16**	(0.06)	0.09	(0.06)	-0.02	(0.08)	-0.04	(0.08)
Life Satisfaction	0.23***	(0.03)	0.11***	(0.03)	0.23***	(0.03)	0.25***	(0.02)
Education (finish age)	-0.01***	(0.00)	-0.02***	(0.00)	-0.00	(0.00)	0.00*	(0.00)
Male	0.16***	(0.03)	-0.20***	(0.04)	-0.05**	(0.02)	0.09***	(0.03)
Age	-0.02***	(0.00)	-0.05***	(0.01)	-0.04***	(0.01)	-0.02***	(0.00)
Age squared x 100	0.02***	(0.00)	0.03***	(0.01)	0.03***	(0.00)	0.01***	(0.00)
Social Class	0.08***	(0.02)	-0.03	(0.03)	0.09***	(0.02)	0.11***	(0.02)
Rural	-0.07**	(0.03)	-0.01	(0.04)	-0.04	(0.03)	-0.06***	(0.02)
Farmer and Fisherman	-0.26**	(0.12)	-0.02	(0.09)	-0.04	(0.08)	-0.12**	(0.05)
Self-Employed	0.14***	(0.05)	-0.08	(0.05)	0.05	(0.05)	0.00	(0.04)
Blue Collar Worker	-0.05**	(0.02)	0.16***	(0.05)	0.03	(0.03)	-0.01	(0.03)
White Collar Worker	0.00	(0.04)	-0.04	(0.03)	0.01	(0.03)	-0.01	(0.03)
Unemployed	-0.09***	(0.04)	-0.06	(0.06)	0.02	(0.04)	-0.05	(0.04)
cut1	-4.57***	(0.19)	-4.48***	(0.24)	-4.03***	(0.17)	-3.15***	(0.11)
cut2	-2.58***	(0.15)	-2.45***	(0.21)	-1.81***	(0.14)	-1.36***	(0.11)
cut3	0.34**	(0.13)	-0.03	(0.18)	0.92***	(0.13)	1.31***	(0.11)
Observations	64,640		42,009		61,745		92,666	
Pseudo-R^2	0.08		0.09		0.10		0.10	

Source: Eurobarometer, 2017. Own calculations.

Note: Standard errors in parentheses. All specifications include region-time fixed-effects. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. $<$ 0.01, p-val. $<$ 0.05, and p-val. $<$ 0.1.

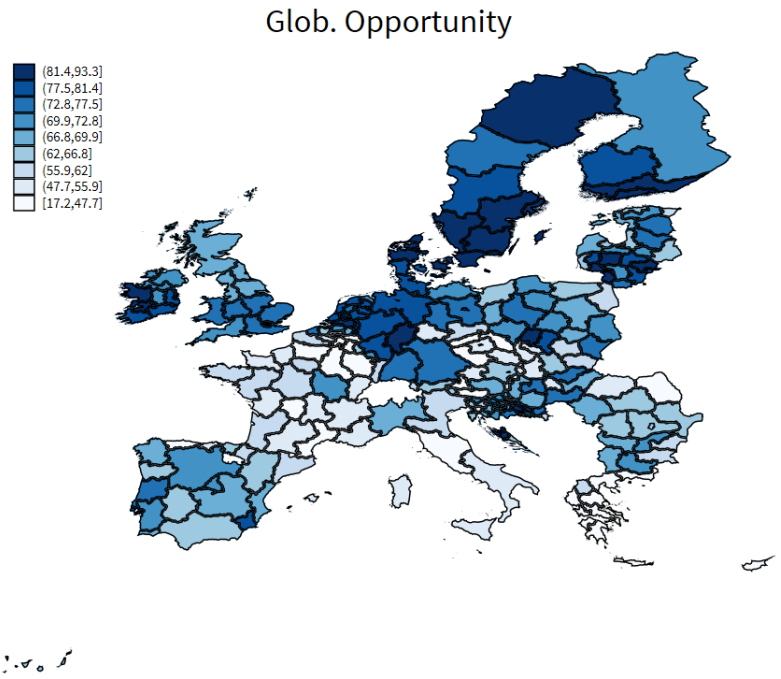
Figure 3.7: Regional Attitudes towards Protectionism



Source: Eurobarometer, 2017. Own illustration.

Note: The figure illustrates average approval rates for protectionism across 247 regions in the EU.

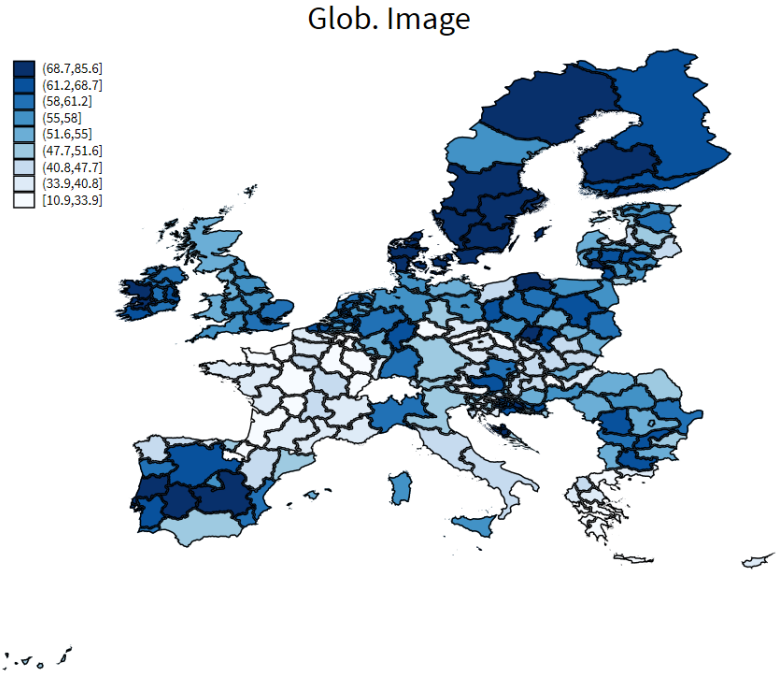
Figure 3.8: Regional Attitudes towards Globalization 1/2



Source: Eurobarometer, 2017. Own illustration.

Note: The figure illustrates average approval rates for globalization across 247 regions in the EU.

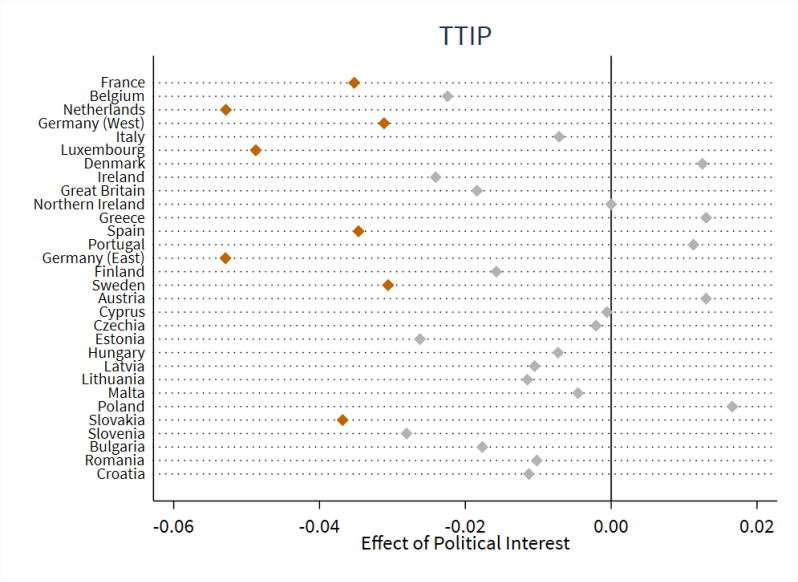
Figure 3.8: Regional Attitudes towards Globalization 2/2



Source: Eurobarometer, 2017. Own illustration.

Note: The figure illustrates average approval rates for globalization across 247 regions in the EU.

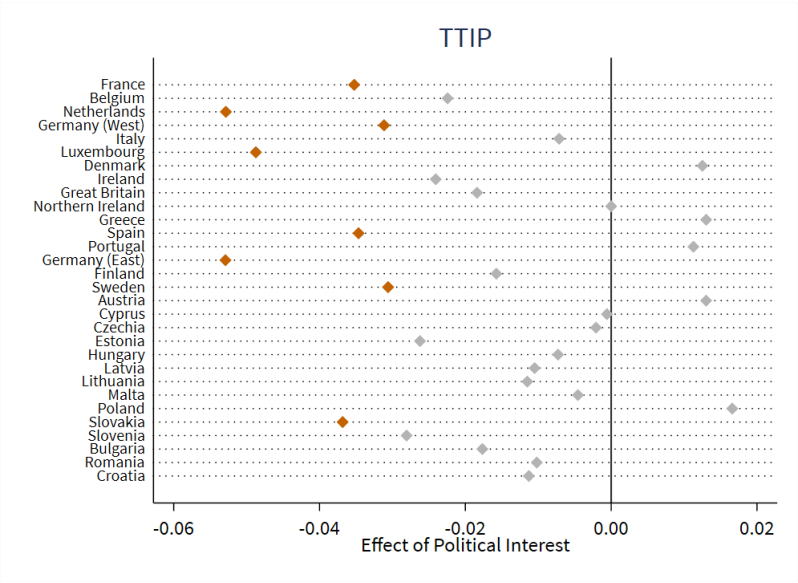
Figure 3.9: Country-specific Narratives 1/5



Source: Eurobarometer, 2017. Own illustration.

Note: The figures illustrate the effect of political interest on the outcome variables. Coefficients vary across countries and exemplify the existence of different country narratives. Significant coefficients (p-val < 0.1) are drawn in color. All else is equal to estimations in Table 3.4.

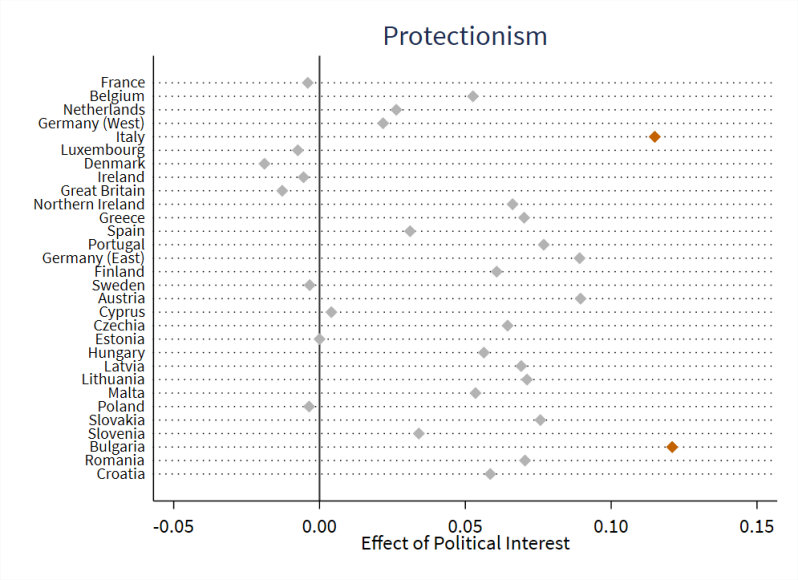
Figure 3.10: Country-specific Narratives 2/5



Source: Eurobarometer, 2017. Own illustration.

Note: The figures illustrate the effect of political interest on the outcome variables. Coefficients vary across countries and exemplify the existence of different country narratives. Significant coefficients (p-val < 0.1) are drawn in color. All else is equal to estimations in Table 3.4.

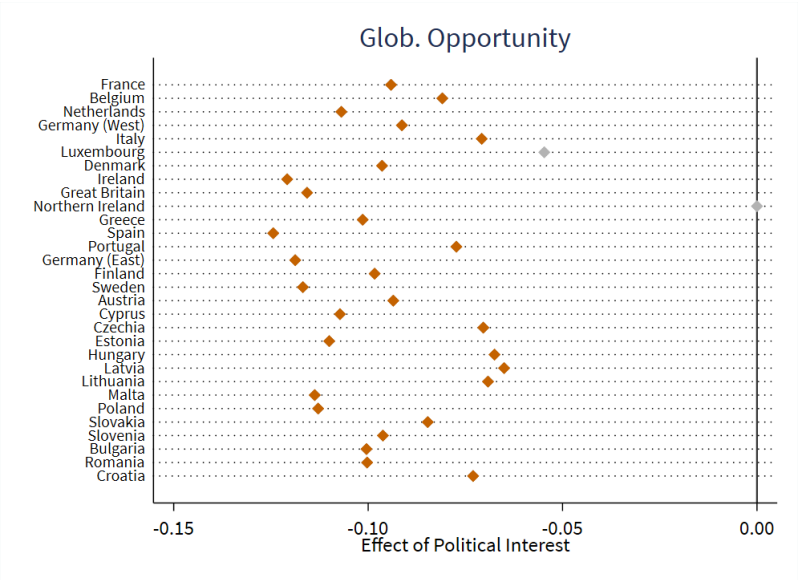
Figure 3.11: Country-specific Narratives 3/5



Source: Eurobarometer, 2017. Own illustration.

Note: The figures illustrate the effect of political interest on the outcome variables. Coefficients vary across countries and exemplify the existence of different country narratives. Significant coefficients (p-val < 0.1) are drawn in color. All else is equal to estimations in Table 3.4.

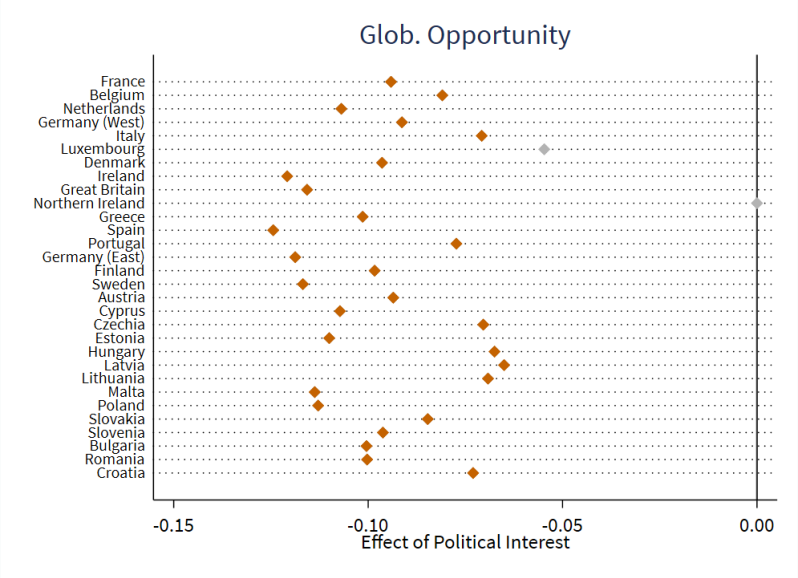
Figure 3.12: Country-specific Narratives 4/5



Source: Eurobarometer, 2017. Own illustration.

Note: The figures illustrate the effect of political interest on the outcome variables. Coefficients vary across countries and exemplify the existence of different country narratives. Significant coefficients (p-val < 0.1) are drawn in color. All else is equal to estimations in Table 3.4.

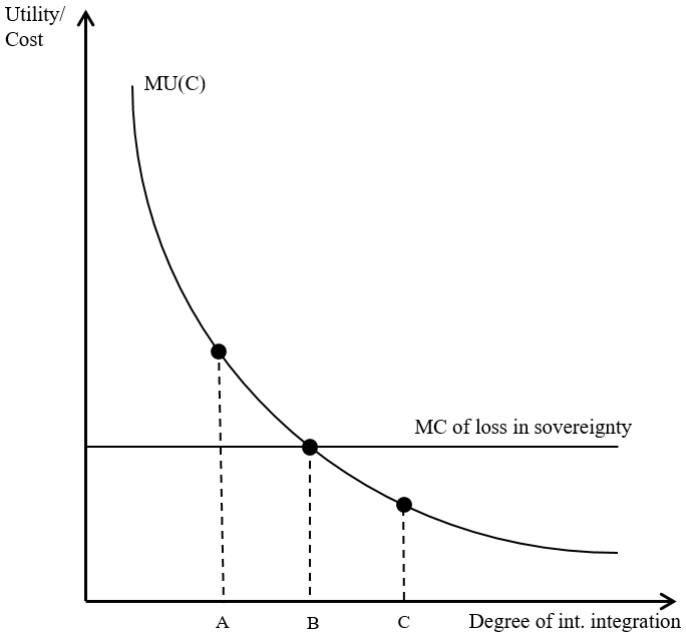
Figure 3.13: Country-specific Narratives 5/5



Source: Eurobarometer, 2017. Own illustration.

Note: The figures illustrate the effect of political interest on the outcome variables. Coefficients vary across countries and exemplify the existence of different country narratives. Significant coefficients (p-val < 0.1) are drawn in color. All else is equal to estimations in Table 3.4.

Figure 3.14: Optimal Economic Integration



Source: Own illustration based on Rodrik (2011).

Chapter 4

On the EU–U.S. Trade Dispute and Tariff Retaliation

"The US now leaves us with no choice but to proceed with a WTO dispute settlement case and with the imposition of additional duties on a number of imports from the US."

Jean-Claude Juncker, EU Press Release (May 31, 2018)

"The World Trade Organization finds that the European Union subsidies to Airbus has adversely impacted the United States, which will now put Tariffs on $11 Billion of EU products!"

Donald J. Trump on Twitter (April 9, 2019)

4.1 Background and Related Literature

Acknowledging the lack of a supra-national authority, which is both willing and able to assert international trading rules, the World Trade Organization (WTO) provisions are designed as a self-enforcing system. Member States have the right to self-compensate in response to trade restrictions that are—legally or illegally—undertaken by another Member State. According to the General Agreement on Tariffs and Trade (GATT), this compensation is conducted by withdrawing "substantially equivalent concessions". The idea of self-compensation constitutes a mechanism that provides a stable equilibrium and internalizes terms-of-trade externalities (Bagwell and Staiger, 1999).[1] In case of trade disputes, Member States notify the WTO Dispute Settlement Body (DSB) and request authorization for their retaliatory measures. This chapter examines on which bases products are selected for tariff retaliation in the ongoing EU–U.S. trade disputes.

There are several reasons why countries impose retaliatory tariffs. Countermeasures to compensate for unlawful foreign subsidies, or rebalancing tariffs in response to safeguard measures are just two examples. For the sake of brevity, and in the context of this analysis, the term retaliatory tariff captures both and is used synonymously with counter-tariffs. In contrast to anti-dumping duties, the common feature of the two aforementioned examples of retaliatory tariffs is that they can be applied to any imported product. Thus, the selection of product lines on which tariffs are levied, is the outcome of a political process and has distributional as well as welfare implications. In light of ongoing global trade tensions that have triggered multiple rounds of tariffs and counter-tariffs, a sound understanding of the product selection for tariff retaliation is of great interest not just for academics but also for policy makers. For this purpose, the following study analyzes four rounds of tariff retaliation[2] between the EU and the U.S. in the period 2018 to 2020.

In principle, all imported products are potentially eligible for tariff retaliation. The total amount of the tariff retaliation measures should equivalently compensate for the initial economic loss suffered by the retaliating party. In June 2018, EU counter-tariffs against U.S. steel and aluminum tariffs on products worth 2.8 bn EUR annually were imposed.[3] In April 2019, two decisions of the WTO Appellate Body lead the EU and the U.S. to impose countervailing duties on each other: ironically enough, within two weeks, the Appellate Body decided that both the EU and the U.S. had violated international trading rules by subsidizing Airbus and Boeing, respectively, in a way that was harmful

[1] The economic theory of GATT is even more comprehensive outlined in Bagwell and Staiger (2004).

[2] These tariffs are either effective, or are threatened to be imposed.

[3] EU Commission – Press Release, June 20, 2018, accessed on June 15, 2019.

to the respective competitor. Instead of solving this dispute by reaching a zero-subsidy agreement, both parties requested retaliatory tariffs to compensate for their economic damages. The U.S. Trade Representative (USTR) published a list of additional duties on imports from the EU worth 11 bn USD (10 bn EUR)[4], and was authorized to apply countermeasures on EU imports amounting to 7.5 bn USD annually.[5] Ultimately, the USTR imposed tariffs of only 10 and 25 percent on these imports.[6]

The EU Directorate-General (DG) Trade, for its part, gave notice about additional tariffs on imports from the U.S. worth 20 bn EUR for which it has requested authorization by the WTO.[7] At the time of writing this chapter, the WTO was still in the process of determining the amount of authorized countermeasures. Due to an allegedly discriminatory French Digital Services Tax, the USTR considers additional tariffs on imports from France worth 2.4 bn USD. Because the total amount of these four tariff rounds is still relatively small compared to the annual trade volume between the EU and the U.S., namely 669 bn EUR in 2018[8], both sides enjoyed high degrees of freedom when choosing their targeted products. This study sheds light on which deliberation the product selection was grounded. Three distinctly different motives are under investigation: beggar-thy-neighbor-type tariffs, politico-economic tariffs, and tariffs that favor-thy-industry.

A large body of literature has evolved around welfare implications of trade policy as well as trade defense measures. With respect to the latter, Bown (2010) takes stock of all temporary trade barriers[9] that existed worldwide between 1990 and 2009, and finds that developing countries have used such measures on a much larger scale than advanced economies. In contrast to this observation, a rethinking of U.S. foreign trade policy by the Trump administration led to new and severe trade restrictions for several of the U.S.' major trading partners after 2017. The imposition of additional duties on steel and aluminum in 2018 marked a turning point for the world trading system: the EU considers these U.S. duties not primarily a national security concern (Article XXI GATT) but rather a standard safeguard measure (Article XIX GATT). The U.S., by contrast, takes the view that national security issues "are not susceptible to review or

[4] USTR – Press Release, April 8, 2019, accessed on June 13, 2019.

[5] For more details on Case No. DS316, cf. WTO Disputes, accessed on January 18, 2020.

[6] In doing so, the U.S. did not make full use of the countermeasures which could otherwise have materialized in 100 percent tariff rates. Later, in February 2020, 10 percent tariffs on aircraft imports were announced to increase to 15 percent, a decision that ultimately was suspended.

[7] EU Commission – Press Release, April 17, 2019, accessed on June 13, 2019.

[8] Source: Comext, 2019.

[9] Bown (2010) uses this term to account for Anti-Dumping, Countervailing, and Safeguard Duties.

capable of resolution by WTO dispute settlement".[10] Even though this case and its final legal assessment by the DSB is still pending, the EU has imposed retaliatory measures against the U.S. that became effective in June 2018. By accepting the national security argument proposed by the U.S., the DSB would open the floodgates for protectionism of any kind justified by national security concerns.

However, the two 2019 tariff waves under investigation differ from the aforementioned case in two major aspects: first, they are countervailing actions to illegal subsidies and therefore independent of this tit-for-tat erection of tariff barriers. Second, these tariff waves are in accordance with a WTO-compliant procedure. For the purpose of this analysis, they provide very recent examples for the selection of retaliatory tariffs.

A further list containing additional tariffs is related to the French Digital Services Tax (DST) which is considered discriminatory by U.S. officials. The U.S. has not officially filed a complaint against France at the WTO but threatens to impose new tariffs following a so-called Section 301 Investigation.[11] This is an example for a situation in which tariffs are used not only as a means of retaliation *after* an adverse economic effect was proven but to prevent the implementation of such a policy *in advance*. In this case, the implementation of tariffs, or the threat thereof, serves as a deterrence tool.

Trade disputes and diametrically opposed views between the EU and the U.S. regarding the interpretation of WTO legislation are as old as the WTO itself. The Banana Case[12] as well as the Hormone Beef Case[13] constitute two shining examples for transatlantic trade controversies that were discussed for decades. These cases are particularly relevant also for an assessment of the effectiveness of retaliation: the announcement of U.S. "carousel retaliation" caused by violations of WTO rules by the EU lead to severe tensions in the early 2000s. In a report for the U.S. Congress, Sek (2002) describes the U.S. approach at that time as follows: in response to protectionist measures for bananas by the EU (which were designed to benefit former EU colonies and oversea territories), the U.S. retaliated. Retaliatory tariffs of 100 percent on certain products were implemented to explicitly target only two EU Member States, namely France and the UK, who were jointly politically accountable for this protectionist action. This is clear evidence for tariff retaliation aiming for a change of foreign trade legislation. However, France and the UK initiated compensatory subsidies for the targeted industries, thereby undermining the intention of the U.S. to increase political pressure by means of the tariffs. Subsequently,

[10] Under WTO Case No. DS548: A Panel was composed on January 25, 2019. For more details, cf. *WTO Disputes.*, accessed on July 26, 2019.

[11] For more details on this investigation, cf. *USTR*, accessed on February 27, 2020.

[12] For more details on Case No. DS16 and DS27, cf. *WTO Disputes*, accessed on July 26, 2019.

[13] For more details on Case No. DS26 and DS48, cf. *WTO Disputes*, accessed on July 26, 2019.

the USTR announced so-called carousel-type retaliation: accordingly, the selection of product lines for retaliation purposes should be revised and adapted after 120 days. This would cause even greater damage, as uncertainty is added to the tariffs. In addition, short notices leave European governments only little time to react which makes compensation difficult, if not impossible. In the view of DG Trade, carousel retaliation is overly punitive and therefore incompatible with the WTO Dispute Settlement Understanding (DSU).[14] After all, "carousel retaliation" has never been invoked in WTO contexts but, eventually, the threat thereof helped reaching settlements.

In the early 2000s, also the EU initiated non-compliance cases against the U.S. Thereby, it successfully challenged U.S. tax rules that enabled offshore Foreign Sales Corporations (FSC), a legal scheme that basically exempted extra-territorial income from taxation.[15] The EU also joined a successful Chinese complaint against U.S. safeguard measures for steel by the Bush administration.[16] Given these notable escalations in international trade relations, the questions was raised, whether the system of self-compensation and retaliation—initially meant to curb protectionism—in fact facilitates protectionism (Lawrence, 2003).[17] It would appear that the recent transatlantic trade tensions and their quid-pro-quo responses echo previous disputes.

The economic consequences of President Trump's trade policy are at the core of several recent studies. Fajgelbaum et al. (2020) analyze welfare effects of the 2018 tariff war. By estimating import-demand and export-supply elasticities, they find a complete tariff pass-through on U.S. consumers. Consequently, this trade policy translates into negative welfare effects for the U.S. even in the absence of foreign retaliation. Estimations based on a general equilibrium model show that tariffs and counter-tariffs jointly cause aggregate welfare losses of 0.04 percent of GDP. Moreover, they find that "workers in very Republican counties bore the brunt of the costs of the trade war", as retaliatory tariffs have mainly targeted the agricultural sector, i.e. rural regions with a high Republican vote share. This can be interpreted as evidence of politically motivated tariff retaliation. Similarly, Amiti et al. (2019) find no measurable terms-of-trade improvement for the U.S. due to newly imposed tariffs and a resulting complete pass-through on U.S. consumers. They quantify the monthly welfare loss for the U.S. economy at 1.4 bn USD. Zoller-Rydzek and Felbermayr (2018), on the other hand, suggest that Chinese exporters bear the lion's share of U.S. tariffs by reducing their export prices. U.S. consumers pay only

[14] EU Commission, Press Release, January 15, 2009, accessed on July 26, 2019.

[15] For more details on Case No. DS108, cf. *WTO Disputes* , accessed on July 30, 2019.

[16] Case Number DS 252, accessed on July 30, 2019.

[17] Instead of withdrawing substantially equivalent concessions, monetary penalties for violators, e.g. annual fines, were suggested (Meltzer et al., 2000, Mikesell, 2001).

25 percent of the tariff burden. Leaving retaliation aside, the U.S. economy generates a net welfare gain of 18.4 bn USD annually. The model they calibrate is fed with trade elasticities from Kee et al. (2008) and Broda et al. (2008).

The topic of tariff incidence has been debated for a long time. The term "beggar-thy-neighbor" traces back to Smith (1776) who employs it to describe mercantilist trade policies.[18] Modern economists relate to gains from protection that occur due to terms-of-trade improvements as beggar-thy-neighbor gains. Bickerdike (1906) formulates a condition when the tariff burden lies on foreign producers: "That, in the case of incipient import taxes, the tendency to advantage is greater the more elastic the demand of the taxing country for the articles taxed." Felbermayr et al. (2013) provide the theoretical framework for tariff wars between non-cooperating welfare-maximizing governments in a two-country heterogeneous firms Melitz (2003) model. They can rationalize strictly positive optimal tariffs.[19]

In an influential contribution building on Krugman (1980), Ossa (2011) rationalizes optimal tariffs greater than zero based on sector reallocation effects. Tariffs that make domestic production more profitable lead to "business stealing", an externality that the system of GATT/WTO tries to internalize. Ossa (2012) shows that the same mechanism applies even when only profit shifting arguments are taken into account. Irwin (2014) investigates tariff incidence of U.S. sugar duties between 1890 and 1930 and identifies asymmetric effects: although tariff reductions have been fully passed through to consumers, they only had to bear 40 percent of an increase in tariffs. Hence, both theoretical as well as empirical strands of the literature suggest the existence of some sort of beggar-thy-neighbor-type tariff incidence, a key premise for testing two of my three hypotheses regarding retaliatory tariffs.

Grounded on the pioneering theory developed by Grossman and Helpman (1994), a large strand of literature empirically examines whether "protection is for sale" (Blanga et al., 2020, Bombardini, 2008, Bown et al., 2020, Gawande and Bandyopadhyay, 2000). For the purpose of this analysis, retaliatory tariffs are at the heart of a field experiment to empirically evaluate whether industry lobbyism determines product selection in the event of tariff retaliation.

There is a widespread consensus among researchers that Nash-bargaining over tariffs requires the threat to retaliate. This rules out unilateral protectionism as a dominant

[18] For access to the relevant part (Book IV, Chapter III, Part II), click *here*.

[19] In their framework not only conventional terms-of-trade considerations but also Melitz (2003) type mark-ups and market-entry costs lead to optimal tariffs greater than zero.

strategy.[20] However, to the best of my knowledge, the question *how* this retaliation should practically be implemented has received only little scientific attention so far. The following analysis attempts to close this gap and adds aspects concerning the rationale behind and optimal choice of product targeting for tariff retaliation from the perspective of political economy.

The following analysis is an attempt to explain four rounds of EU–U.S. retaliatory tariffs based on these three motives. The remainder is structured as follows: Section 4.2 outlines theoretical arguments for the selection of retaliatory tariffs. Section 4.3 introduces the data sources that are employed. Section 4.4 presents the results of the empirical analysis, and Section 4.5 sketches policy recommendations for more effective and transparent modes of tariff retaliation. Finally, Section 4.6 summarizes and concludes.

4.2 Theory

When examining the motivation for selecting products for tariff retaliation, three distinct considerations (and an interplay of them) are at the core of the following analysis. These are:

Beggar-thy-Neighbor Tariffs Products can be selected based on optimal tariff theory. It suggests that in a static world, a tariff whose incidence is borne by the foreign producer, is welfare-improving and would therefore be the optimal choice for tariff retaliation. Aside from tariff incidence considerations, terms-of-trade improvements that lead to lower import prices can result from retaliatory tariffs. Setting such tariffs requires some sort of terms-of-trade power. This is particularly interesting in the case of the EU and the U.S., as these are the two largest economies of the world.[21] Beggar-thy-neighbor-type tariffs in a broader sense also involve business stealing arguments. However, this aspect is negligible for the purpose of this analysis. Sector reallocation is particularly important for long-term oriented trade policy. Retaliatory tariffs are designed to be removed again shortly after the underlying trade dispute is resolved and therefore do not qualify to attract production. In this chapter, the term beggar-thy-neighbor tariff is used to refer to

[20] Bagwell and Staiger (1999) show that Nash-bargaining over tariffs is inefficient and that cooperative solutions are welfare improving. They also describe the importance of reciprocity as a key principle of GATT: this principle moderates the withdrawal of substantially equivalent concessions that follow in response that a country's deviates from concessions it has committed to. Thus, reciprocity is equivalent to some sort of limited retaliation.

[21] A decrease in world market prices due to a reduction of domestic import demand requires market power, e.g. in the situation of a monopsony. The EU and the U.S. jointly account for approximately half of the global demand.

tariffs whose incidence is borne by the foreign economy. For the sake of convenience, they are also called Type 1 tariffs.

I employ the Soderbery (2018) model framework to empirically test whether retaliatory tariffs are set optimally: the utility function is given by the consumption of fixed shares of imported and domestically produced goods separated by a Cobb-Douglas parameter. The sub-utility derived from the composite imported goods is CES-aggregated across imported varieties. Elasticities of substitution σ_k^i are good-importer specific. The export supply curve is upward-sloping and characterized by a constant elasticity following Feenstra (1994). Soderbery (2018) extends the supply structure by allowing for importer-exporter-good-specific elasticities, denoted by ϵ_k^{ij}. Similar as in Broda and Weinstein (2006) and Broda et al. (2008), the welfare maximizing tariff is an inverse function of the export supply elasticity:

$$t_k^{ij*} = \frac{1}{\epsilon_k^{ij}} \tag{4.1}$$

where ϵ_k^{ij} is strictly positive. This is the case when country i discriminates perfectly across varieties and trading partners. In practice, this is generally ruled out by the most favored nation principle, a restriction in the WTO legislation that prohibits discrimination across trading partners. However, for the purpose of setting retaliatory tariffs—which are discriminatory by default—heterogeneous export supply is a nice theoretical feature.

The optimal tariff is independent of the slope of the demand curve since its objective is to generate tariff revenue at the expense of foreign producer rents. This is the strict definition of beggar-thy-neighbor-type tariff setting. The steepness of import demand, however, is worth a closer examination, too: the elasticity of import demand has consequences for the amount of tariff revenues and for the degree to which markets are distorted by tariffs. Choosing products characterized by a completely inelastic import demand would minimize the consumer deadweight loss and maximize tariff revenues.

Politico-Economic Tariffs Tariffs can be chosen in such that certain foreign industries and/or regions are subject to counter-tariffs. The idea behind this politically motivated retaliation is to concentrate losses in such a way that the public in the target country takes notice. The goal is to draw attention to the initial trade restrictions that caused counter-measures in the hope that local politicians or industry interest groups will lobby for their removal. This type of retaliation is short-term oriented with the objective to

change foreign trade policy even at the cost of a sub-optimal level of domestic welfare.[22] These tariffs, however, come at the risk of increasing the likelihood of trade compensation measures by the foreign government. Consequently, the effectiveness of politico-economic tariff retaliation may be determined by the view that "many pinpricks" are more preferable than a "few hammer strokes"- as the effect of the latter can be offset more easily. This is essential when examining the distribution of trade volume of targeted products. For the sake of convenience, this type of tariff is called Type 2 tariff.

Favor-thy-Industry Tariffs Retaliatory tariffs can be the result of lobbying activities. Since trade authorities are free to choose any product for retaliation purposes, announcing to imposition of retaliatory tariffs is likely to function as a playground for lobbyists. The reasons are high economic stakes—monopoly rents "at best"—that could potentially be divided between producers, lobbyists, politicians, and bureaucrats. Therefore, private rent-seeking or industry policy considerations[23] are important drivers for the selection of retaliatory tariffs. In case of the EU, the distribution of rents across Member States might come on top of these considerations. For the sake of convenience, this type of tariff is called Type 3 tariff.

Setting Type 1 and Type 2 tariffs is neither necessarily a trade-off, nor mutually exclusive. With respect to Type 2 tariffs, a sufficient degree of beggar-thy-neighbor-type tariff selection would even be a prerequisite, as it ensures that economic costs are borne by the foreign economy. Therefore, it represents a sub-case of Type 1 tariffs. On the contrary, welfare implications of Type 3 tariffs are obviously negative for the domestic economy: while beggar-thy-neighbor tariffs, at best, do not affect domestic consumer prices at all, favor-thy-industry tariffs are designed by construction to raise domestic prices such that higher producer surpluses materialize. Therefore, Type 3 tariffs are strongly at odds with the aforementioned welfare and politico-economic considerations.

4.3 Data Description

Trade data from the year prior to the coming into effect of retaliatory tariffs serve as undistorted baseline to calculate the trade volume affected by the additional tariffs. Eu-

[22] Politico-economic tariffs can be welfare-maximizing when assessing welfare dynamically. This is the case, if tariff retaliation fulfills its purpose, e.g. full settlement of the underlying trade dispute.

[23] If tariff authorities simply decide to let some industries benefit from the imposition of retaliatory tariffs.

ropean import data on the 8-digit product level for the years 2017 and 2018 are taken from Comext. Data on 2018 U.S. imports stem from the USITC.[24] Applied or announced product list chosen for retaliation by the EU and U.S. are taken from official sources.[25] Novel import demand and export supply elasticities at the 6-digit product level are taken from Soderbery (2018) whose estimations are based on bilateral trade data from the period 1991 to 2007.[26] For the sake of notation: let σ_k^i denote the import demand elasticity for importer i and good k, and let ϵ_k^{ij} be the export supply elasticity for importer i, exporter j, and good k. Data on most favored nation (MFN) tariffs and tariff elimination schedules for the EU are taken from the WTO. Information on U.S. tariffs are accessed via USITC.

4.4 Discussion of Results

This section discusses both stylized facts about the selection of retaliatory tariffs as well as the results of the empirical analysis that tests the aforementioned hypotheses. As the four waves of tariff retaliation under investigation differ with respect to timing, cause, amount and affected partner country affected, this section follows a case-by-case structure. Sections 4.4.1 and 4.4.2 examine tariffs imposed or intended by the EU, while Sections 4.4.3 and 4.4.4 investigate U.S. tariffs.

4.4.1 EU 2018 Retaliatory Tariffs (Steel and Aluminum)

In response to U.S. steel and aluminum tariffs, the EU imposed retaliating measures on U.S. imports worth 2,846 mn EUR in June 2018. The choice of measures is a symmetric

[24] Please note that methodological differences apply to the different data sources. Trade data are internationally harmonized up to the 6-digit level. Products on the 8-digit level (EU CN8 and U.S. HTS8) are therefore not directly comparable. Comext data are denoted *CIF* (including cost, insurance, freight), whereas the U.S. records customs values. These differences, however, do not matter for the purpose of this analysis as EU and U.S. retaliatory measures are analyzed separately.

[25] U.S. Steel and Aluminum tariffs following the Section 232 investigation are described in detail here (*Steel* and *Aluminum*). U.S. Countervailing Duties following the Section 301 investigation on Airbus can be accessed here (*Longlist* and *Shortlist*). U.S. Countervailing Duties following the Section 301 investigation on the French Digital Service Tax can be accessed here (*Shortlist*). EU tariffs in response to U.S. steel and aluminum Tariffs (Juncker List) can be accessed here (*Shortlist*, a longlist that circulated before May 18, 2018, is not available online anymore). EU countervailing duties in response to illegal U.S. subsidies for Boeing can be accessed here (*Longlist*, a shortlist is not yet available as the WTO has not made a final decision on the amount of retaliation to which the EU is entitled.

[26] Soderbery (2018) structurally estimates elasticities in the absence of an instrumental variable. The advancement of this estimation compared to Feenstra (1994), Broda and Weinstein (2006) and Broda et al. (2008) is the implementation of heterogeneous export supply elasticities, which provide an interesting source of variation for empirical applications.

response to the U.S. action: the total amount exactly mirrors the volume of EU exports, on which the U.S. Administration has levied tariffs. Also, the duty rate, namely 25 percent on 2,728 mn EUR and 10 percent on 117 mn EUR, meets the U.S. action. In total, 182 8-digit products are affected. These 182 products represent 2.2 percent of imported product lines, and account for 1.1 percent of import volumes. Interestingly, the 2017 trade volume for 5 of these products equals zero.[27] Generally, non-traded products on the list are of great interest as they could indicate lobbyism. See Section 4.4.3 for a detailed discussion.

The trade volume affected by retaliation varies greatly across product lines: the top 10 product lines account for more than half of the total trade volume. Top products are whiskey (4 product lines, 561 mn EUR), cosmetics (3 product lines, 336 mn EUR), motorcycles (166 mn EUR), motorboats (154 mn EUR), maize (131 mn EUR), and playing cards (117 mn EUR). For 152 product lines, annual EU imports are below 20 mn EUR. It is questionable whether tariffs on these 152 product lines qualify as Type 2 retaliation since media coverage and political impact should positively depend on economic significance. Anecdotal evidence suggests that the treatment of iconic products such as whiskey, which predominantly harms the U.S. State of Tennessee, a politically important state for the Republican Party, and large motorcycles, which effectively only hits Harley Davidson, received a lot of attention in both the U.S. and the EU. Harley Davidson finally announced to fully bear the tariff cost such that European consumers would not face higher prices until production is shifted to Thailand in order to circumvent tariffs.[28] Hence, the latter is, at least temporarily, an optimal tariff.

Exposure by EU Member State In the particular case of a customs union, such as the EU, a common good problem arises when selecting products for tariff retaliation: each individual Member State benefits from retaliating as a whole—assuming that retaliation is the dominant strategy in trade disputes and terms-of-trade improvements materialize for every member—but would like to minimize its own share of affected imports. Welfare implications in the EU are as follows: tariff revenues go into the EU budget[29] but shrinking consumer surpluses are borne by the respective Member State. Hence, in order to ensure political support by its Member States, a balanced distribution of costs due to retaliation might be an implicit objective for the EU when selecting products for tariff retaliation.

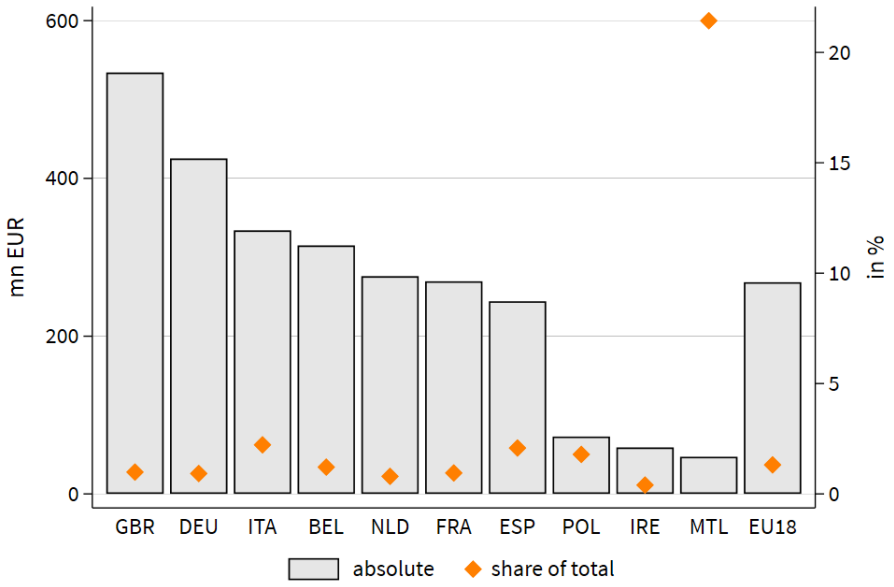
[27] Some of these non-traded products belong to the same 6-digit product line as other treated products with strictly positive import volume. Treating them with tariffs could indicate that tariff evasion due to misclassification is taken into consideration.

[28] This case received particular media coverage, cf. *here*, accessed on February 27, 2020..

[29] The collecting Member State retains only a portion of 20 percent to cover cost of collection.

Figure 4.1 plots the affected imports in absolute values and relative to total imports from the U.S. For most EU Member States, retaliatory tariffs affect 1 percent or less of total U.S. imports. Italy, Poland, and Spain face slightly higher import exposures. Most notably, Malta appears to be affected the most with 22 percent of its transatlantic imports being subject to retaliatory tariffs. The reason for this are tariffs on motorboats: Malta imports U.S. motorboats worth 45 mn EUR, almost one third of the Union's total imports in this product line. This exception apart, costs of retaliation seem to be fairly balanced across EU Member States.

Figure 4.1: EU Steel Retaliation: Trade Volumes Affected, mn EUR and %



Source: EU Commission, 2019. Comext, 2019. Own illustration.

Note: The figure displays the largest trade volumes affected by 2018 retaliatory tariffs for selected EU Member States. Imports refer to 2017 annualized values. Absolute values are denoted in million EUR (left axis) and shares of total import volumes are denoted in percent (right axis). EU18 comprises all EU Member States unless indicated separately.

Product Selection – Beggar-thy-Neighbor Evaluating whether or not the tariff incidence is borne by domestic consumers or foreign producers requires an examination of the underlying trade elasticities. As argued in Section 4.2, a product is optimally chosen for tariff retaliation if its export supply elasticity is sufficiently low. In case of EU imports from the U.S., for 90 percent of imported product lines the optimal tariff is below 10 percent (and close to zero in most cases). Hence, I suspect that the probability for product k being selected for retaliation decreases in ϵ_k^{ij}, where i denotes the importing,

and j the exporting country. The regression equation for a linear probability model that estimates the probability for country i to impose a retaliatory tariff τ on product k yields

$$Pr(\tau_k^i = 1) = \beta_0 + \beta_1 \epsilon_k^{ij} + \beta_2 \sigma_k^i + u_k^i \tag{4.2}$$

where the sign of the regression coefficient β_1 is of particular interest. Including σ_k^i provides information whether retaliatory tariffs are chosen such that the government maximizes tariff revenues. Some specifications include i- or j-fixed effects.

Table 4.1 shows estimation results for the model specified in Equation 4.2. Coefficients point in the expected direction; however, they are statistically indistinguishable from zero. Thus, no empirical evidence can be established that trade elasticities might have influenced the selection process of this tariff round.

Table 4.1: Trade Elasticities and the Selection of Tariffs 1/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Export Supply Elasticity	-0.001		-0.001	-0.002		-0.002
	(-0.59)		(-0.58)	(-0.61)		(-0.61)
Import Demand Elasticitiy		0.005	0.005		0.005	0.005
		(0.59)	(0.59)		(0.59)	(0.59)
Importer FE				✔	✔	✔
Observations	57,861	57,861	57,861	57,861	57,861	57,861

Source: EU Commission, 2019. Comext, 2019. Soderbery (2018). Own calculations.

Note: Ordinary least square estimates, coefficients display standardized beta-coefficients, t-statistics in parentheses. Standard errors are clustered at the importer level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Product Selection – Favor-thy-Industry As stressed above, industry protection might be an objective for policy makers when selecting products for retaliation. Determining industries whose protection seems politically desirable is not straight-forward. Protection that is already in place can serve as a reasonable proxy. EU MFN tariffs of 2017 were set prior to recent EU–U.S. trade disputes. These tariffs vary across products and are arguably exogenous to retaliatory tariffs against the U.S., as they apply not only to the U.S. but to all Member States of the WTO. For some products, instead of an ad-valorem, a specific tariff (or a combination of the two) is applied.[30] Oftentimes, these

[30] For example, the specific EU tariff for product 02.01.1000 (Frozen Bovine Carcases) yields "12.8 % + 176.8 EUR/100 g". Such a tariff is also called "compound tariff".

tariff lines refer to commodity or agri-food products. I also exploit other measures of EU industry protection, such as import quotas. One of the EU's most comprehensive trade agreements is with Canada (CETA). Even in this framework, some products remain excluded from liberalization, others receive a preferential tariff rate only after several years according to the tariff elimination schedule. Thus, I combine information on EU quotas and those products that are protected by CETA in order to obtain a third measure for industry protection.

Testing whether industry protection plays a role for the selection of retaliatory tariffs, I estimate a linear probability model according to the following regression equation:

$$Pr(\tau_k = 1) = \beta_0 + \beta_1 MFN_k + \beta_2 Specific + \beta_3 Protection_k + u_k \tag{4.3}$$

where MFN is the k-specific ad-valorem tariff rate in percent, $Specific$ and $Protection$ are binary variables that take the value 1 if product k is subject to specific tariffs or enjoys other forms of protection, respectively. Since tariffs, quotas, and other trade policy measures do not differ across EU Member States, this estimation has no importer i dimension. Some specifications include industry-fixed effects which refer to the HS-2-digit product level.

Table 4.2 depicts the estimation results: first, the applied MFN tariff is positively associated with the probability of a product being included in the retaliation list. The mean MFN tariff rate of treated products is 5.6 percent, 1.2 percentage points higher than for non-treated products. The effect of specific tariffs is ambiguous depending on the specification. Products that enjoy other forms of protection are less likely to be chosen for retaliation purposes. None of the effects is statistically significant. Therefore, given these measures of industry protection, no evidence can be established that such considerations determine the selection of products for retaliation.

Table 4.2: Industry Protection and the Selection of Tariffs 1/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
MFN Tariff Rate (%)	0.001		0.001	0.003		0.003
	(0.49)		(0.52)	(1.10)		(1.19)
Specific Tariff		0.021	0.022		-0.003	0.006
		(0.71)	(0.73)		(-0.09)	(0.21)
Other Protection		-0.017	-0.024		-0.013	-0.021
		(-1.09)	(-1.27)		(-0.49)	(-0.77)
Industry FE				✔	✔	✔
Observations	8,404	8,404	8,404	8,404	8,404	8,404

Source: EU Commission, 2019. WTO, 2020. Own calculations.
Note: Ordinary least square estimates, coefficients display standardized beta-coefficients, t-statistics in parentheses. Standard errors are clustered at the industry level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Brief Impact Evaluation Quantifying potential gains from trade diversion entails a comparison of consumer price and production data in order to calculate changes in producer surpluses. Feeding a general equilibrium (GE) consistent model with this data allows for a comprehensive welfare analysis. Such an attempt is constrained by the fact that prices and production data are not available at the same resolution as trade and tariff statistics. However, given the relatively small share of affected trade, GE effects are likely to be minor. Thus, a partial equilibrium analysis can provide a meaningful approximation. In this context, the equation of a standard diff-in-diff linear estimation model takes the following form:

$$\Delta Y_{ck}^{ij} = \beta_0 + \beta_1 \tau_k^{25} + \beta_2 \tau_k^{10} + u_{ck}^{ij} \tag{4.4}$$

where ΔY_{ck}^{ij} denotes first differences in imports of product k by country i from country j. Let the superscript c of the dependent variable Y account for the logarithm of either import volumes, or import quantities, or import prices, respectively. The treatment is defined as EU retaliatory tariffs τ, which equal an ad-valorem duty rate of either 10 or 25 percent. The pre-treatment period is defined as the first half year 2018, the post-treatment is the first half of 2019. Some specifications include importer i-fixed effects, or industry-fixed effects at the HS-2-digit-level. Please note that the author is aware of endogeneity concerns that do not allow a casual interpretation of regression results in this setting.

To account for the fact that trade diversion effects for the U.S. are expected to work in the opposite direction as for intra-EU exports and exports from the rest of the world,

I interact the treatment indicator with a dummy variable that takes the value 1 if the exporter is the U.S. The equation of this triple-diff estimation reads:

$$\Delta Y_{ck}^{ij} = \beta_0 + \beta_1 \tau_k^{25} + \beta_2 \tau_k^{25} + \beta_3 US + \beta_4 \tau_k^{25} \times US + \beta_5 \tau_k^{10} \times US + u_{ck}^{ij} \qquad (4.5)$$

Reaction of U.S. Exports Table 4.3 shows the estimation results for trade effects of the EU retaliation disentangled by price and quantity adjustments according to Equation 4.5. The following observations are noteworthy: first, retaliatory tariffs entail slightly decreased product prices.[31] The effect is statistically significant only for high tariffs and relatively small in size. Nevertheless, it could indicate a kind of terms-of-trade improvement for the EU. However, prices of treated U.S. products do not significantly differ from the overall price increase of U.S. imports by 8 percent. Second, import quantities from the U.S. fall by 7 percent on average. Import volumes and quantities of treated products from the U.S. decline sharply. Import quantities from the U.S. treated with a 25 percent tariff fall by 38 percent. This is additional to 8 percent lower imports for non-treated imports from the U.S. Measured in value terms, the import of treated products declines by 36 percent. Import volumes from EU suppliers and the rest of the world treated with a 25 percent tariff do not react significantly, although coefficients are positive. In terms of quantity, imports increase by 2 percent. Third, import quantities of products treated with a 10 percent tariff from non-U.S. suppliers increase by 28 to 32 percent. This increase is offset by price drops such that the overall trade volume does not react significantly.

In absolute numbers, the total import volume (half year base) of treated products from the U.S. fell from 1.5 bn EUR to 900 mn EUR within one year. At the extensive margin, the number of non-traded products increased to 12 out of 182 in 2019. Conclusively, the welfare loss due to a shrinking number of varieties available in the EU is subordinate compared with the drastic decline in the intensive trade margin. Table 4.11 in the Appendix shows estimation results for simple diff-in-diff estimations according to Equation 4.4 exclusively for imports from the U.S. The results support the findings illustrated in Table 4.3 qualitatively and quantitatively .

[31] Measured in unit values and *CIF* (including cost of transportation).

Table 4.3: EU Steel Retaliation: Trade Effects, Triple-Diff

	Δ Prices		Δ Quantities		Δ Volumes	
	(1)	(2)	(3)	(4)	(5)	(6)
US	0.08	0.08	-0.06	-0.07	0.01	0.01
	(11.62)***	(12.56)***	(-6.19)***	(-6.76)***	(1.09)	(1.09)
25 Percent Tariff	-0.01	-0.01	0.02	0.02	0.01	0.01
	(-2.48)**	(-2.62)**	(1.94)*	(1.83)*	(0.92)	(0.92)
25 Percent Tariff × US	0.04	0.04	-0.48	-0.48	-0.44	-0.44
	(1.72)*	(1.67)	(-8.17)***	(-8.18)***	(-9.65)***	(-9.65)***
10 Percent Tariff	-0.13	-0.11	0.28	0.25	0.14	0.14
	(-1.94)*	(-1.61)	(3.03)***	(2.88)***	(1.68)	(1.68)
10 Percent Tariff × US	0.20	0.20	-0.32	-0.31	-0.11	-0.11
	(1.54)	(1.54)	(-1.15)	(-1.13)	(-0.50)	(-0.50)
Importer FE		✔		✔		✔
Industry FE		✔		✔		✔
Observations	1,812,207	1,812,207	1,812,207	1,812,207	1,812,207	1,812,207

Source: EU Commission, 2019. Comext, 2019. Own calculations.

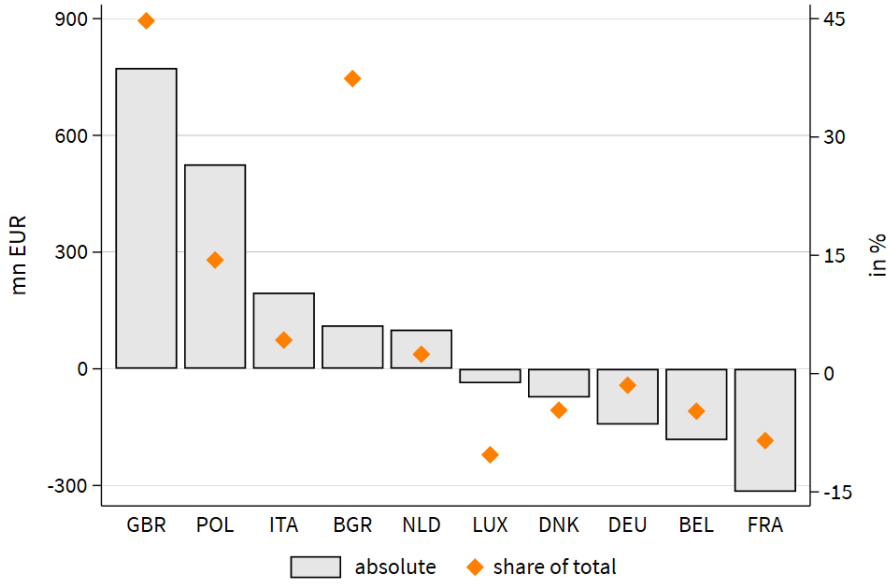
Note: Ordinary least square estimates, dependent variables are log-transformed and differentiated, t-statistics in parentheses. Change of dependent variable is $(e^{\beta} - 1) \times 100\%$. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Reaction of intra-EU Exports According to standard trade models, imports should not only divert away from the exporter that is harmed by new trade barriers; a substitution effect should ensure the replacement of U.S. imports with imports from other suppliers. This can either occur due to an expansion of domestic production or by means of imports from third countries. This paragraph focuses on domestic adjustments, i.e. intra-EU trade. Intra-EU trade of treated products increased by 3.2 percent, compared to 2.3 percent for non-treated products. In absolute terms, the increase of the former amounts to 1.5 bn EUR on a half yearly basis. Increases vary greatly across EU Member States. Figure 4.2 depicts the five Member States with the largest increases and decreases in exports of treated products, respectively. Both in absolute and relative terms, the UK's exports increased the most: within one year, British exports increased by 45 percent, or 773 mn EUR.[32] Poland follows in absolute terms (+526 mn EUR), and Bulgaria in relative changes (+37 percent). French sales of treated products, on the other hand, declined by 317 mn EUR, or 8 percent. In relative terms, Luxembourg is the country that is most negatively affected, with exports decreasing by 10 percent. The reduction of intra-EU

[32] This increase is almost entirely driven by sales of motorboats, which increased from 152 to 948 mn EUR.

exports in some EU Member States may point to increased domestic absorption triggered by declining imports from the U.S.

Figure 4.2: EU Steel Retaliation: Change in intra-EU Exports, mn EUR



Source: EU Commission, 2019. Comext, 2019. Own illustration.

Note: The figure displays the change in intra-EU exports of products treated with retaliatory tariffs. Changes reflect differences of exports between 2018 (first half-year) and 2019 (first half-year). Absolute values are denoted in million EUR. Selected Member States are among the top 5 with the largest increases and the top 5 with the largest decreases.

Table 4.12 in the Appendix shows the estimation results for intra-EU trade effects of the retaliatory tariffs estimated according to Equation 4.4. The estimation follows the above described diff-in-diff framework. 25 percent tariffs do not statistically significantly impact prices, quantities, or trade volumes. Exports of products treated with a 10 percent tariff, by contrast, increased by 31 to 35 percent in terms of quantities. Prices drop by 12 to 15 percent. These two effects work in opposite directions so that volume effects are not statistically significant despite positive point estimators. This is evidence for the absence of substantial trade diversion effects.

Reaction of Third Country Exports Former EU imports from the U.S. can be substituted by imports from third countries. The estimated trade effects according to Equation 4.4 for imports from the rest of the world are shown in Table 4.13 in the Appendix. Import trade volume of treated products does not change significantly. It appears that import prices of products treated with a 10 percent tariff increase by 19 to 22 percent. Interestingly, the 25 percent tariff treatment does not lead to higher import

prices. Quantities do not adjust significantly in specifications that include fixed effects. This is additional evidence that there are no measurable trade diversion effects.

4.4.2 EU 2019/2020 Countervailing Duties (Boeing)

EU countervailing duties are not yet in place but a longlist was announced in April 2019. The EU is currently seeking approval from the WTO to compensate for the unlawful subsidization of Boeing. The list contains 390 8-digit products, 11 of which were not traded in 2018.[33] See Section 4.4.3 for a detailed discussion of non-traded products. Corresponding imports amount to 25.7 bn EUR or 9.6 percent of total imports from the U.S. in 2018.[34] Products of 33 HS-2-digit industries could be subject to retaliatory tariffs; 4.7 percent of traded product lines are affected. The intensive trade margin is affected twice as much as the extensive trade margin, which is entirely outlier-driven: the U.S. aircraft industry is affected by tariffs on three product lines whose export volume to the EU amounts to 16 bn EUR.[35] Other targeted industries are mining (tariffs on coal, 2 products worth 1.5 bn EUR of imports) and machinery (7 products worth 1.3 bn EUR of imports). Thus, EU countervailing duties are first and foremost directed to U.S. aircraft exports whose subsidies are the bone of contention in this trade dispute. The average import volume of treated non-aircraft products is very low, namely 25 mn EUR. Hence, the observed pattern is similar as described in Section 4.4.1. The EU seems to target the extensive trade margin in particular, i.e. many products with low import volumes.

Exposure by EU Member State Figure 4.3 shows the import volume affected by Member State, both in absolute terms as well as relative to total imports from the U.S. Ireland is by far the most severely affected EU Member State: 52 percent of the country's imports from the U.S. could be subject to EU tariffs in near future. In absolute terms, Irish imports of 8.8 bn EUR are at stake, which amounts to more than twice as much as British imports (3.5 bn EUR) and four times as much as German imports (2.1 bn EUR), making Germany the least affected economy in relative terms (4.3 percent). France and Italy (both 5.3 percent) show little exposure, too, whereas Polish (21 percent) and Swedish (22 percent) exposure is much higher. In contrast to retaliatory tariffs described in Section 4.4.1, the distribution of potential cost due to countervailing duties regarding

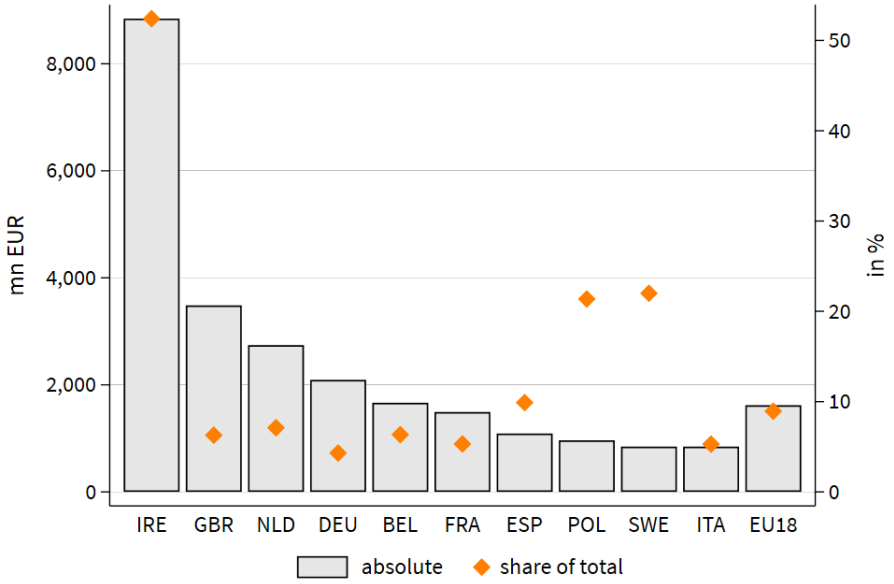
[33] A few of these non-traded products belong to the same 6-digit product line as other treated products with strictly positive import volume. Their treatment might could indicate that tariff evasion due to misclassification should be avoided.

[34] Please note that retaliatory tariffs described in Section 4.4.1 are still in place and would add to these CVDs.

[35] The lion's share of this, more than 15 bn EUR, is the export of large airplanes.

Boeing subsidies is strikingly unbalanced across EU Member States. Apparently, other reasons than balancing import exposure must be at the core of this selection process.

Figure 4.3: EU Boeing Retaliation: Trade Volumes Affected, mn EUR and %



Source: EU Commission, 2019. Comext, 2019. Own illustration.

Note: The figure displays the trade volumes affected by 2019 EU retaliatory tariffs for selected EU Member States. Imports refer to 2018 annualized values. Absolute values are stated in million EUR (left axis), and their shares of the total import volumes are stated in percent (right axis). EU18 comprises all EU Member States unless indicated separately.

Product Selection – Beggar-thy-Neighbor With respect to the elasticity approach outlined in Section 4.2, estimation results specified by Equation 4.2 are depicted in Table 4.4. Coefficients for export supply elasticities point in the expected direction but are insignificant. Interestingly, import demand elasticities are significantly negatively correlated with the probability of a tariff being selected for retaliation. This effect is not particularly sizeable but remains robust across specifications. Hence, tariff revenue maximization might be one motive for the selection of tariffs.

Table 4.4: Trade Elasticities and the Selection of Tariffs 2/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Export Supply Elasticity	-0.002		-0.002	-0.002		-0.002
	(-0.87)		(-0.87)	(-0.77)		(-0.77)
Import Demand Elasticitiy		-0.005	-0.005		-0.005	-0.005
		(-5.48)***	(-5.48)***		(-5.66)***	(-5.66)***
Importer FE				✔	✔	✔
Observations	57,825	57,825	57,825	57,825	57,825	57,825

Source: EU Commission, 2019. Comext, 2019. Soderbery (2018). Own calculations.
Note: Ordinary least square estimates, coefficients display standardized beta-coefficients, t-statistics in parentheses. Standard errors are clustered at the importer level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Product Selection – Favor-thy-Industry Examining whether industry protection plays a role in the selection of EU retaliation in the Boeing case, I employ the same linear probability estimation as defined in Equation 4.3. Results are shown in Table 4.5. An MFN tariff increase by 1 percentage point increases the probability for product k being selected for retaliation by 0.2 to 0.3 percentage points. Interestingly, this effect reverses when including industry-fixed effects. In this case, a tariff increase by 1 percentage point makes a selection by 0.4 percentage points less likely. This implies that products from industries with tariffs higher than average are chosen. Within industries, however, products are chosen whose tariffs are relatively lower. Expressed in absolute numbers, the MFN tariff of selected products equals 5.5 percent, 1.2 percentage points higher than MFN rates of non-treated products. Specific tariffs make the selection for retaliation by 9.5 to 9.6 percent more likely. This effect diminishes after including industry-fixed effects as specific tariffs are only applied to products in a small subset of HS-2-digit industries. A negative coefficient for other protection measures is statistically insignificant. These results indicate that already protected industries benefit from additional protection by retaliatory tariffs.

Table 4.5: Industry Protection and the Selection of Tariffs 2/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
MFN Tariff Rate (%)	0.002		0.003	-0.004		-0.004
	(2.00)**		(2.28)**	(-2.67)***		(-2.54)**
Specific Tariff		0.095	0.096		0.020	0.007
		(1.93)*	(1.97)*		(0.47)	(0.16)
Other Protection		-0.032	-0.045		-0.079	-0.066
		(-0.91)	(-1.34)		(-1.65)	(-1.53)
Industry FE				✔	✔	✔
Observations	8,278	8,278	8,278	8,278	8,278	8,278

Source: EU Commission, 2019. WTO, 2020. Own calculations.
Note: Ordinary least square estimates, t-statistics in parentheses. Standard errors are clustered at the industry level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

4.4.3 U.S. 2019 Countervailing Duties (Airbus)

Following the initial announcement in April 2019, U.S. CVDs in response to illegal Airbus subsidies took effect on October 18, 2019. Differences between the preliminary tariff list (hereinafter referred to as the longlist) and the final list are striking: the longlist contains 308 8-digit products, the final list includes 158 products, which are sub-headings of 19 HS-2-digit sectors. This reduction was necessary since the WTO granted retaliatory measures of only 7.5 bn USD, while the U.S. had requested authorization for retaliatory measures of 11 bn USD. This number was reflected by the longlist. For reasons of credibility and transparency, the final list is expected to be a strict subset of the longlist. This is not the case: only 106 products are identical implying that the final list contains 52 "new" products.

The U.S. concentrate their retaliatory measures not only on imports from countries who are directly or indirectly shareholders of Airbus[36] but expand them also on all other EU Member States. The final list includes 15 sections defining distinct groups of affected Member States. According to 2018 trade data, 28 products from the list were not imported at all. This is all the more interesting, as some sections of the tariff list are aimed at one specific country only. In particular when selecting products that are relevant only to single countries—in this case these are Germany and the UK—, strictly positive import volumes are to be expected. Obviously, Type 1 and Type 2 tariffs fall short to explain this selection, particularly, as some of these products are unique within

[36] These are France, Germany, Spain, and the United Kingdom.

their HS-6-digit subheading. Hence, it is unlikely that these products are on the list only to avoid potential tariff evasion by misclassification. On the one hand, some of these 28 products may have been included in the longlist "by mistake". However, it is questionable how 8 of these product lines were not originally part of the longlist but were eventually included in the final list. On the other hand, rent-seeking could provide the cause: even without current import competition, industries might lobby for protection in anticipation of future import competition. The 28 products are mainly dairy products and certain types of cheese.

Exposure by EU Member State Figure 4.4 depicts the affected trade volumes and the relative exposure to U.S. CVDs for the four Airbus shareholder countries and the rest of the EU. The total volume of exports that is affected by additional tariffs amounts to 10.5 bn USD. A duty of 10 percent is levied on new airplanes (not included are parts thereof), whereas all other products (5.4 bn USD) are subject to 25 percent ad-valorem tariff. The total amount exceeds the 7.5 bn USD granted by the WTO; this is because one 8-digit product line is only partially covered by the tariff list.[37] France is affected the most, both in relative as well as in absolute terms. French exports of 4.7 bn USD, or more than 8.8 percent of total exports to the U.S., are affected by retaliatory tariffs. Germany ranks second in absolute terms but is, in relative terms, the least affected Airbus shareholder nation (1.9 percent of total exports). Other EU Member States' exports worth 870 mn USD (0.4 percent of their total exports) are subject to U.S. CVDs. Malta, Croatia, and Slovakia are not affected at all.

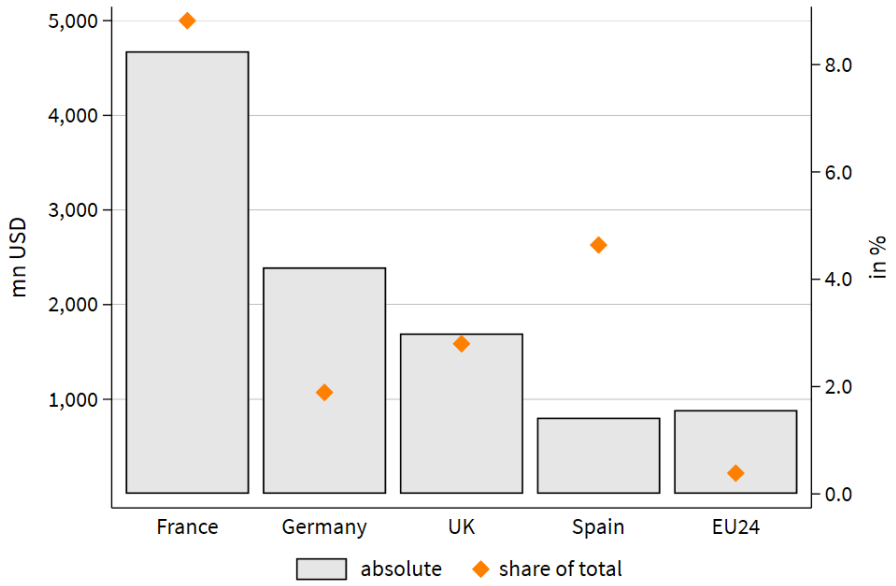
Table 4.10 in the Appendix shows the number of affected product lines per country. At the extensive margin, countries are affected differently by U.S. CVDs: the numbers for Germany (59), the UK (54), and Spain (44) are fairly proportionate to the affected trade volume. The mean trade volume per product line is between 18 (Spain) and 41 (Germany) mn USD. For France, by contrast, CVDs apply to only two product lines: airplanes and (bottled) wine.[38] The import of French wine alone amounts to 1.2 bn USD in 2018 and is now subject to an additional 25 percent tariff rate.

Potential Trade Deflection There are two reasons why the U.S. focuses its retaliation measures so heavily on the French wine industry. First, France and the U.S. are involved in another politically sensitive trade dispute over a French Digital Services Tax (see Section 4.4.4). Second, wine (as many other processed food products) is well-suited to

[37] This refers to the HTS Code 8802.40.00 (airplanes), of which only a portion of sub-headings is to be covered by CVDs. Of imports worth 5.1 bn USD, only 2.1 bn USD are effectively treated with CVDs.

[38] HTS Codes 8802.40.00 and 2204.21.50.

Figure 4.4: U.S. Airbus Retaliation: Trade Volumes Affected, mn USD and %



Source: USITC, 2020. USTR, 2020. Own illustration.

Note: The figure displays trade volumes affected by U.S. 2019 CVDs for Airbus shareholders and other EU Member States. Imports refer to U.S. 2018 annualized values. Absolute values are denoted in million USD (left axis), and their shares of the total import volumes are denoted in percent (right axis). EU24 comprises all EU Member States unless indicated separately.

avoid trade deflection. Trade deflection is a sort of tariff evasion that exploits tariff differentials in triangular trade relationships. Without the application of rules of origin (RoO), trade deflection would be most profitable the higher the tariff differential and the lower the additional transportation cost (Felbermayr et al., 2019). With respect to U.S. CVDs, these conditions hold true: The EU constitutes a customs union that does not require RoO. This makes it difficult for the U.S. to sustain a tariff scheme that discriminates between EU Member States. Affected products from one Member State could easily be shipped to another Member State that is exempt from retaliation. Moreover, costs of shipment between EU Member States are relatively low compared to a 25 percent ad-valorem tariff.

Out of 158 selected products, the U.S. has chosen only 51 product lines, for which no EU Member States is exempted. Thus, trade deflection is theoretically possible for 107 product lines. Once post-treatment U.S. import data are available, evaluating the effect of trade deflection could be the subject of further research. However, trade deflection affects the set-up of a list with retaliatory tariffs: selecting products with protected designations of origin or other geographical indications avoids trade deflection. With tongue in cheek:

French wine does not become Polish wine if it is shipped to Poland for export to the U.S. And if producers were to relabel French wine as Polish wine, they would lose much of their value; this procedure is therefore not qualified to effectively circumvent CVDs. Taking into consideration the entire U.S. retaliatory tariff list, it is striking that the U.S. predominantly targets products that lack the character of a commodity and are therefore less prone for trade deflection.

Product Selection – Beggar-thy-Neighbor Please note that for EU Member States' exports to the U.S., only 7 percent of product lines meet an optimal tariff rate of more than 10 percent according to the optimality condition defined by Equation 4.1 (cf. Section 4.2). Table 4.6 presents estimation results for U.S. retaliatory tariffs based on the linear probability model outlined in Equation 4.2. Two observations are particularly striking: the more inelastic the supply curve, the higher the probability that a certain product is chosen for retaliation. This effect is robust when controlling for exporter-fixed effects. In terms of magnitude, however, it is relatively small.[39] On the contrary, demand-side elasticity considerations have no statistically significant effect on the product selection process. Nevertheless, these results provide evidence for the presence of beggar-thy-neighbor-type tariffs.

Table 4.6: Trade Elasticities and the Selection of Tariffs 3/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Export Supply Elasticity	-0.002		-0.002	-0.002		-0.002
	(-5.01)***		(-5.01)***	(-9.67)***		(-9.66)***
Import Demand Elasticitiy		0.001	0.001		0.000	0.000
		(0.34)	(0.34)		(0.25)	(0.25)
Exporter FE				✔	✔	✔
Observations	68,457	68,457	68,457	68,457	68,457	68,457

Source: USITC, 2020. USTR, 2020. WITS, 2020. Soderbery (2018). Own calculations.
Note: Ordinary least square estimates, coefficients display standardized beta-coefficients, t-statistics in parentheses. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Product Selection – Favor-thy-Industry Table 4.7 shows estimation results for the linear probability estimation according to Equation 4.3. The ad-valorem MFN tariff rate in place has no measurable effect on the probability of a product being selected. The

[39] Coefficients in Table 4.6 are displayed as standard beta-coefficients. Accordingly, a one standard deviation increase of the dependent variable leads to a change of the independent variable by $\beta\times$ the standard deviation of the independent variable.

average tariff rate for treated products is 4.6 percent, 0.5 percentage points higher than for non-treated products. In fact, products that are subject to specific tariffs have a 4.4 percentage points higher probability to become part of the U.S. retaliation list. This effect diminishes when including industry-fixed effects. This is additional evidence for some sort of industry protection: not certain products, but industries which are generally more protected—specific tariffs apply only to a subset of industries—are likely to benefit more from additional protection through retaliatory tariffs. In terms of magnitude, however, this effect is relatively small.

Table 4.7: Industry Protection and the Selection of Tariffs 3/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
MFN Tariff Rate (%)	0.000		-0.000	-0.000		-0.000
	(0.48)		(-0.25)	(-0.17)		(-0.19)
Specific Tariff		0.044	0.044		0.005	0.005
		(2.27)**	(2.35)**		(0.30)	(0.30)
Industry FE				✔	✔	✔
Observations	9,574	9,574	9,574	9,573	9,573	9,573

Source: USITC, 2020. USTR, 2020. Own calculations.
Note: Ordinary least square estimates, t-statistics in parentheses. Standard errors are clustered at the industry level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Towards Carousel Retaliation On March 18, 2020, the U.S. revises its countermeasures against EU Member States and the United Kingdom.[40] Tariffs on civil aircraft and aircraft parts should be raised from 10 to 15 percent ad-valorem.[41] Non-aircraft tariffs remain at 25 percent and are subject to only one change: prune juice is removed from the list and replaced by butchers' knives. Interestingly, European prune juice exports were not affected by the initial retaliatory tariffs. It belongs to Section 14 of the tariff list, which targets all EU Member States except France. However, the only positive export volumes come from France. Tariffs on butchers' knives are limited to imports from Germany and France. The total volume amounts to 13k USD per year. This slight modification points to several open questions: what are the reasons for imposing a tariff on zero trade flows by exempting the only exporter? And why, instead of revoking this exemption, is the relevant product replaced by another product whose export volume is entirely irrelevant?

[40] On February 15, 2020, the USTR notified about modifications of their measures due to illegal Airbus subsidies. The revised tariff list can be accessed here (*Modified Shortlist*).

[41] At the time of writing this study, the tariff rate increase has been suspended.

4.4.4 U.S. 2019/2020 Retaliatory Tariffs (French DST)

The U.S. and France are involved in another dispute over a French "digital services tax" (DST), which is—according to U.S. officials—discriminatory against U.S. tech giants.[42] In December 2019, the USTR published a list including 63 8-digit products that can be subject to 100 percent ad-valorem tariffs in the event that the DST issue is not resolved in the near future. The WTO is not involved in this dispute. On the one hand, the tariff list specifies the compensation for expected losses due to the French DST and serves to discourage potential imitators. On the other hand, it can be argued that the list raises the escalation level to resolve another trade conflict between the U.S. and France, namely the liberalization of European agricultural and food markets within the framework of a transatlantic free trade agreement.

The selected products represent 2.4 bn USD or 4.4 percent of U.S. imports from France in 2018. Two products from the list were not imported in 2018.[43] The selection of products resembles the pattern discussed before (cf. Section 4.4.3). Relevant trade volumes are only affected in three industries: cosmetics (5 product lines, 918 mn USD), sparkling wine (1 product line, 707 mn USD), and handbags (10 product lines, 408 mn USD). These are, again, products with strong brand attachment which makes them less prone to trade deflection.

Product Selection – Beggar-thy-Neighbor Table 4.8 displays estimation results according to Equation 4.2. Apparently, neither import demand nor export supply elasticities are statistically significantly correlated with the probability of a product being selected for retaliation.

[42] The U.S. initiated a Section 301 investigation in 2019.

[43] HTS Codes 0406.30.48 and 0406.10.84 refer to Edam/Gouda cheese and fresh cheese, respectively. The likely reason for including these products might be to avoid tariff evasion by misclassification.

Table 4.8: Trade Elasticities and the Selection of Tariffs 4/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Export Supply Elasticity	0.003		0.003	0.004		0.004
	(0.90)		(0.90)	(1.89)*		(1.89)*
Import Demand Elasticitiy		-0.002	-0.002		0.000	0.000
		(-0.90)	(-0.90)		(0.09)	(0.09)
Industry FE				✔	✔	✔
Observations	6,190	6,190	6,190	6,190	6,190	6,190

Source: USITC, 2020. USTR, 2020. WITS, 2020. Soderbery (2018). Own calculations.
Note: Ordinary least square estimates, coefficients display standardized beta-coefficients, t-statistics in parentheses. Standard errors are robust heteroskedasticity. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Product Selection – Favor-thy-Industry In case of retaliatory tariffs on French products, industry protection arguments cannot be substantiated. Estimation results based on Equation 4.3 are shown in Table 4.9. Despite the fact that MFN tariffs of treated products amount to 6.9 percent compared to 4.1 percent of non-treated products, a positive relationship between MFN tariffs and the probability of tariff selection cannot be established. Point estimates are positive. With respect to specific tariffs, point estimates are positive without industry-fixed effects and change sign when including the latter. These coefficients are not statistically distinguishable from zero.

Table 4.9: Industry Protection and the Selection of Tariffs 4/4

	Pr(τ=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
MFN Tariff Rate (%)	0.001		0.001	0.001		0.001
	(1.17)		(1.07)	(1.17)		(1.22)
Specific Tariff		0.015	0.013		-0.011	-0.012
		(0.82)	(0.68)		(-0.92)	(-1.02)
Industry FE				✔	✔	✔
Observations	6,384	6,384	6,384	6,384	6,384	6,384

Source: USITC, 2020. USTR, 2020. Own calculations.
Note: Ordinary least square estimates, t-statistics in parentheses. Standard errors are clustered at the industry level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.$<$ 0.1.

4.5 Towards a Transparent Protocol for Retaliation

Retaliation by tariff barriers is designed to compensate for unilateral protectionism. Moreover, if the threat to retaliate is credible, retaliatory tariffs should prevent unilateral protectionism ex ante. This optimistic view might turn out to be wrong as such tariffs actually enter into effect. However, recent developments in international trade relations show that once tariffs are in place, political negotiations on their simultaneous reduction are initiated. It is yet too early to finally assess the effectiveness of this power-based trade policy approach. However, retaliation, i.e. the withdrawal of substantially equivalent of concessions, is not just a form of power-projection but in fact highly relevant for the functioning of the rules-based trading system. This is why policy makers should increase their efforts to evaluate the effectiveness of tariff retaliation. Additionally, to avoid giving the impression that "protection is for sale", governments could define protocols that define the product selection in the event of trade conflicts. For this purpose, I propose the following guidelines:

1. **Transparency** could serve as commitment device to avoid succumbing to industry lobbyists at the expense of domestic consumers. Policy makers would have to justify their decisions and could be held politically accountable for non-transparent procedures.

2. **Tariff incidence** should be shifted towards the counterparty to the greatest possible extent. This would require a commitment from policy makers to an elasticity approach. In this way, the proposed procedure would continue to allow tariff selection to be motivated by political considerations, i.e. concentrating losses to certain industries or regions. This objective function could actually be maximized under to constraint of a maximum level of domestic welfare.

3. **Non-traded products** should only be subject to retaliatory tariffs if tariff evasion due to misclassification is likely. Otherwise, the only reasons for these tariffs would be arguments of industry protection which are not justified by the very purpose of retaliatory tariffs.

4. **Uncertainty** for the counterparty should be maintained in a sense that the selection of products for retaliation cannot be fully anticipated. Otherwise, under perfect foresight, trade compensation measures could be implemented already in advance rendering politico-economic tariffs ineffective. Hence, random samples could be drawn from a longlist defined by an elasticity approach as described in Point (2).

5. **Carousel retaliation** could be applied in order to increase uncertainty and to avoid compensating measures by the foreign government. It is also unclear, whether

foreign producers would perceive carousel-type relation as overly punitive as it limits individual losses and distributes costs borne by the economy more evenly. A prerequisite for its deployment should be, however, WTO-compliance. It would be desirable if the WTO provides legal certainty on this sort of retaliation.

6. **In case of the EU,** adverse effects on Member States could be compensated by redistribution but should not play a role in the selection of products for retaliation. Choosing products other than those defined as "optimal" by Point (2) comes at the cost of domestic welfare.

7. **In case of the U.S.,** the possibility of trade deflection has to be taken into consideration. Applying an asymmetric tariff scheme to member states of a customs union is unstable and will lead to unintended side-effects. In order to avoid trade deflection it would either be necessary to impose symmetric measures against all EU Member States or to select products with strong brand attachment or geographical indications. The latter, of course, is limited to the number of traded products belonging to this category.

Obviously, an elasticity approach that defines a welfare maximizing selection of products has steep data requirements on reliable import demand and export supply elasticities. The lack of the same is a well-known obstacle for researchers; but solid data—as this study tries to emphasize—is of utmost importance for applied trade policy. Hence, all institutions in charge should increase their efforts to improve the quality of international trade data. Such a protocol as a first-best solution requires strong commitment by the relevant institutions as well as reliable trade elasticity data. Both could limit its implementation in practice. Thus, also a second-best procedure should be taken into consideration. Acknowledging the fact that protection is to some extent for sale, and that lobbyism cannot be ignored, the question arises: why not make protection for sale? Producers, e.g. individual firms or industry associations, could bid for levying tariffs on certain product lines. Products receiving the highest bids (e.g., per million of affected import value) could be chosen until the total targeted import volume reaches the amount intended for retaliation. A second-price auction would encourage firms to reveal their true willingness-to-pay. Such an auction for tariffs would largely extract protection rents and revenues could easily be redistributed. In contrast to lobbyism , the proposed approach constitutes a transparent procedure that prevents the privatization of protection rents by producers.

4.6 Concluding Remarks

This chapter contributes by providing a brief history of the idea and the use of retaliation in the field of international trade. Moreover, this chapter gives an overview of recent transatlantic trade disputes and categorizes different types of retaliatory tariffs according to GATT. Section 4.2 outlines three motives that can explain the product selection for retaliation: shifting the tariff incidence abroad according to optimal tariff theory, concentrating losses abroad in politically sensitive regions or industries, and rent-seeking by domestic lobbyists. I find evidence that for the U.S., tariff selection is motivated by a beggar-thy-neighbor approach. With respect to the EU, some evidence points in the direction that tariff revenue maximizing might be objective when choosing products for retaliatory tariffs. Political motives, by contrast, seem to play a more important role: targeting certain relevant industries in the foreign country, e.g. French wine producers, is presumably better suited to induce a policy change than imposing tariffs on a variety of product lines that are traded at low values. However, this observation is based on anecdotal evidence and needs to be further elaborated.

This chapter also argues that trade deflection is a severe issue for the U.S.—as it would be for any other trade opponent of the EU—when retaliating against only specific Member States of the EU. Most likely, asymmetric tariffs on members of a customs union cannot be sustained for a longer period of time. Therefore, the U.S. has selected products with strong brand attachment and geographical indications which are less prone to trade deflection. These are novel insights that have not been discussed in the literature. Both the EU and the U.S. have treated products with retaliatory tariffs even in the absence of positive trade volumes. In some cases, this could prevent tariff evasion through misclassification; but in other cases, domestic lobbyism is the most probable cause. This chapter also performs a brief impact evaluation of EU tariff retaliation in response to U.S. steel and aluminum tariffs in 2018. Imports of treated products from the U.S. fall by 36 percent; the decline occurred mainly in the intensive trade margin. U.S. suppliers, however, do not react by lowering their export prices. Moreover, there is little evidence that the EU also has some terms-of-trade power resulting in lower import prices from third countries.

Appendix Chapter 4

Table 4.10: U.S. 2019 CVDs (Airbus): Products and Trade Volume Affected, mn USD and %

	Number of products affected	Import value affected	Imports value total	Share affected %
France	2	4,677	53,037	8.8
Germany	59	2,394	126,536	1.9
UK	54	1,696	60,595	2.8
Spain	44	806	17,377	4.7
EU24	64	886	228,857	0.4

Source: USITC, 2020. USTR, 2020. Author's calculation.

Note: The table lists the number product lines (Column 1) and trade volumes (Column 2) affected by U.S. 2019 CVDs for Airbus shareholders and other EU Member States. Column (3) displays the total import volume in 2018. Column (4) displays the share of imports in % that is affected by U.S. 2019 CVDs. EU24 comprises all EU Member States unless indicated separately.

Table 4.11: EU Steel Retaliation: Trade Effects U.S.

	Δ Prices		Δ Quantities		Δ Volumes	
	(1)	(2)	(3)	(4)	(5)	(6)
25 Percent Tariff	0.03	0.01	-0.43	-0.42	-0.46	-0.43
	(1.44)	(0.28)	(-9.71)***	(-8.93)***	(-8.25)***	(-6.45)***
10 Percent Tariff	0.07	0.07	0.03	0.01	-0.04	-0.06
	(0.63)	(0.61)	(0.13)	(0.03)	(-0.16)	(-0.21)
Importer FE		✔		✔		✔
Industry FE		✔		✔		✔
Observations	77,777	77,777	77,777	77,777	77,777	77,777

Source: EU Commission, 2019. Comext, 2019. Author's calculations.

Note: Ordinary least square estimates, dependent variables are log-transformed and differentiated, t-statistics in parentheses. Change of dependent variable is $(e^{\beta} - 1) \times 100\%$. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Table 4.12: EU Steel Retaliation: Trade Effects intra-EU

	Δ Prices		Δ Quantities		Δ Volumes	
	(1)	(2)	(3)	(4)	(5)	(6)
25 Percent Tariff	-0.01	-0.01	0.01	0.01	0.01	0.01
	(-1.42)	(-1.91)*	(1.44)	(1.27)	(0.78)	(0.64)
10 Percent Tariff	-0.16	-0.13	0.30	0.27	0.15	0.14
	(-3.15)***	(-1.79)*	(3.26)***	(2.77)**	(1.81)*	(1.50)
Importer FE		✔		✔		✔
Industry FE		✔		✔		✔
Observations	1,587,487	1,587,487	1,587,487	1,587,487	1,587,487	1,587,487

Source: EU Commission, 2019. Comext, 2019. Author's calculations.

Note: Ordinary least square estimates, dependent variables are log-transformed and differentiated, t-statistics in parentheses. Change of dependent variable is $(e^{\beta}-1)\times 100\%$. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Table 4.13: EU Steel Retaliation: Trade Effects Third Countries

	Δ Prices		Δ Quantities		Δ Volumes	
	(1)	(2)	(3)	(4)	(5)	(6)
25 Percent Tariff	-0.03	-0.02	0.05	0.04	0.03	0.02
	(-1.79)*	(-1.04)	(2.59)**	(1.48)	(1.63)	(1.01)
10 Percent Tariff	0.20	0.17	-0.07	-0.01	0.13	0.16
	(2.36)**	(2.05)*	(-0.63)	(-0.07)	(0.88)	(1.05)
Importer FE		✔		✔		✔
Industry FE		✔		✔		✔
Observations	146,943	146,943	146,943	146,943	146,943	146,943

Source: EU Commission, 2019. Comext, 2019. Author's calculations.

Note: Ordinary least square estimates, dependent variables are log-transformed and differentiated, t-statistics in parentheses. Change of dependent variable is $(e^{\beta}-1)\times 100\%$. Standard errors are clustered at the country level. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

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