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Abstract

We examine the effects of the 2018-2019 U.S. tariffs on Greek goods exports using industry- and firm-level data within a difference-in-differences framework. The results reveal considerable heterogeneity: eight out of seventeen products experienced declines in exports, six saw increases, and the rest showed no significant change. Firm-level analysis confirms part of this heterogeneity. While many export-oriented firms were resilient, some in specific industries experienced either export and sales declines or gains. A notable case is the aluminum sector, where firms experienced substantial increases in exports, pointing to potential sector-specific advantages. We also find modest evidence of export market substitution as a mitigating strategy. Our findings highlight the nuanced, sector-dependent effects of trade policy shifts. Policymakers should design support for affected firms through targeted trade promotion, market diversification incentives, and streamlined export procedures to enhance resilience against trade shocks.

Keywords: U.S. tariffs, Greek exports, Difference-in-Difference, export market substitution, export support schemes.

JEL Classification: F14

1 Introduction

On July 12, 2025, the U.S. President announced a sweeping tariff policy targeting major economic partners. Effective August 1, a 30% tariff will apply to most imports originating from the European Union (EU) and Mexico, alongside steeper levies on goods from Canada (35%) and Japan (25%). The administration framed the measure as a corrective response to persistent and, in its view, "unfair" bilateral trade deficits. However, this marks a significant departure from established multilateral trade norms and has provoked strong reactions from key trading partners. In a special economic impact assessment, the European Commission projected that symmetric retaliatory tariffs could reduce EU GDP by 0.3% to 0.4%, primarily due to a contraction in EU exports to the U.S. This development risks reigniting global trade tensions reminiscent of the 2018-2019 tariff cycle, when similar protectionist measures caused notable supply chain disruptions and heightened investor uncertainty.

The full implications for Greek exports remain highly uncertain. Although the U.S. accounts for approximately 4.9% of total Greek goods exports and contributes around 1% of Greek GDP, it remains Greece's most important non-EU trading partner and one of its top five export destinations. This paper seeks to provide an early assessment of the likely impact of the 2025 U.S. tariff package on Greek exports, drawing on the precedent of the 2018-2019 U.S. trade policy shift. We aim to offer empirical insights into the vulnerabilities and adjustment capacity of a small open economy operating in a renewed climate of trade protectionism.

The U.S. foreign trade stance in 2018-2019 was marked by the imposition of additional tariffs under two key legal instruments: Section 232 of the Trade Expansion Act of 1962, which authorized tariffs on national security grounds, and Section 301 of the Trade Act of 1974, which addressed perceived unfair foreign trade practices. Under Section 232, a 25% tariff on imported steel and 10% on aluminum were broadly implemented across most countries. Section 301 tariffs, introduced in 2019 in the context of the Airbus-Boeing dispute, imposed 25% duties on a wide range of EU goods exported to the U.S. As a result, Greek exports were exposed to these tariffs, affecting sectors such as steel, aluminum, wine, cement, mineral fuels, edible products (including olives and olive oil), electrical machinery, and pharmaceuticals. However, three core Greek export goods (olives, olive oil, and feta cheese) were exempted from the 25% tariff and remained subject only to baseline duties, provided specific packaging and composition conditions were met.

In this study, we examine the direct impact of the 2018-19 tariffs on bilateral exports from Greece to the U.S., conducting analysis at both the industry- and firm-level. We begin by comparing the export performance of tariff-affected products to non-affected products during the 2018-2019 period. The three products, namely olives, olive oil, and feta cheese, that were excluded from the additional tariffs serve as a counterfactual in our empirical framework. In other words, we measure the impact of tariffs on affected products using non-affected products as the baseline.

We thus compare the export performance of affected products as a deviation from that of non-affected products to estimate the causal impact of the tariff shock. Using the UN Comtrade database, we identify product categories affected by U.S. tariffs and estimate the overall average impact. We then disaggregate results by industry, allowing for differential responses to the tariff shock, and investigate potential export market substitution for products that experienced declines in U.S. demand. At the firm-level, we use matched samples from ICAP and Orbis Europe. We employ a difference-in-differences approach with propensity score matching and estimate the average effect of tariffs on firm-level export performance. We also estimate pooled regressions to explore the robustness of these effects across firms and industries.

Our findings can be summarised as follows. First, our results suggest a small aggregate decline in exports among tariff-affected products in the post-2018 period, which is, however, not statistically significant. Second, we estimate significant differences in individual product-level responses. Eight products experienced a statistically significant decline in exports, relative to the counterfactual group: fish, cement, oil seeds, preparations of vegetables excluding olives, wine, mineral fuels, steel articles, and electrical machinery. The average decline in exports varies from 15% (preparations of vegetables) to 85% (steel articles). At the same time, we find that five products experienced a statistically significant increase in exports: fruit, vegetables, pharmaceuticals, aluminum, and mechanical appliances. The average increase in exports, compared to the counterfactual group of products, ranges from 10% (pharmaceuticals) to 37% (aluminum). Exporters of these products appear to have successfully mitigated the burden of tariffs, reflecting tariff avoidance strategies highlighted in the literature and discussed below. Among the products that experienced export declines, we present evidence that five exhibited compensatory gains in exports to third-country markets, suggesting some degree of export diversion or reallocation. Third, the firm-level analysis reveals a positive average effect on the export value of firms affected by tariffs, although this becomes statistically insignificant when the control group is broadened to include likely exempted firms. A notable finding is the significant increase in exports from the aluminum industry, suggesting that certain sectors benefited from tariff carve-outs, reallocation dynamics, or strong domestic demand despite the adverse trade shock.

The remainder of the paper is structured as follows. Section 2 provides a brief review of existing literature. Section 3 gives an overview of Greek exports to the U.S. and the rest of the world. Section 4 describes the industry-level data and presents the corresponding results. Section 5 focuses on the firm-level analysis and empirical findings. Finally, Section 6 offers policy recommendations.

2 A brief review of the literature

Exporting presents significant growth opportunities for firms by enabling access to larger markets, fostering economies of scale, and facilitating exposure to advanced technologies and management practices abroad (Wagner, 2016). While empirical evidence confirms that larger and more profitable firms are more likely to engage in export activity, participation in international markets can also yield substantial benefits for average firms through improvements in productivity and technological capabilities. These firm-level gains contribute to broader economic growth. Moreover, exporting has positive implications for labor markets, as exporting firms typically offer higher wages and demonstrate greater demand for skilled labor compared to non-exporters. Given these potential positive effects, it is crucial to understand how export behavior responds during periods of trade disruptions.

A tariff is a tax charged on the products imported from other countries. Tariffs are paid by the importer and are collected by customs agencies on behalf of the government which imposed them. Therefore, when a U.S. firm imports a product subject to a tariff, it pays 1) the invoice to foreign exporters and 2) the additional tariff depending on the rate applicable to this product. Numerous implications of tariffs arise for importers and exporters. Focusing on exporters, they will face pressure on their profit margin or market share or both. The main determinants of tariff pass-through include the price elasticity of demand, the extent to which export markets are competitive or oligopolistic, the degree of product differentiation (homogeneity), and the exchange rate.

Tariffs are a core instrument of trade policy, typically imposed to protect domestic industries or to retaliate against unfair trade practices. While their immediate effect is on imports, tariffs can also indirectly shape export outcomes by altering relative prices, disrupting supply chains, or triggering reciprocal trade restrictions. A rich literature has documented that firms do not respond uniformly to tariff shocks: some reduce exports, others shift destination markets, adjust export prices, volumes, or values, adapt product characteristics, enhance domestic sales, follow tariff avoidance strategies or absorb costs depending on their size, sector, and financial resilience (Javorcik and Narciso, 2008; Flaaen et al., 2020; Albornoz et al., 2021; Almunia et al., 2021; Cavallo et al., 2021; Jiao et al., 2022; Friedrich and Zator, 2023; Minondo, 2024). However, empirical evidence on how such heterogeneity plays out in smaller, open economies - especially in the context of recent U.S. trade actions - is still limited.

Firms may counteract declining sales by exploring opportunities in alternative markets, suggesting potential substitution across export destinations. Specifically, larger and more productive firms, which are more export-oriented and more flexible in adapting to rising trade barriers, are more likely to expand exports to new destinations (Flaaen et al., 2020; Friedrich and Zator, 2023). Albornoz et al., (2021) assess the impact of U.S. tariff policy changes on Argentinean exports and find that

the number of Argentinean exporters to the U.S. declined. Similarly, Jiao et al., (2022) find that following the U.S. tariff policy change, Chinese exports to the U.S. declined significantly, with only limited evidence of a partial shift toward the EU. Javorcik and Narciso, (2008), and Minondo, (2024) show that exporters can rely on tariff avoidance strategies as an additional channel to offset the adverse effects of a tariff hike.[1]

3 Greek exports to the U.S. and to the world, 2000 - 2024

An overview of the value of Greek goods exports (henceforth exports) to the U.S. and the rest of the world over the last 25 years is displayed in Figure 1. In 2000, the total value of Greek exports was 10.85 billion Euros. The value of exports to the U.S. was 0.63 billion Euros, namely 5.82% of the total value of goods exports. Over time, both total exports and exports to the U.S. followed an upward trend, amounting by 2024 to 53.3 billion Euros (total exports) and 2.6 billion Euros (exports to the U.S.). In 2024, the percentage of the value of exports to the U.S. in terms of the total value of exports was approximately 4.9%. During the years of additional tariffs (2018 - 2021), both exports to the U.S. and to the world declined, amounting in 2020 to 1.3 billion Euros (exports to the U.S.) and 35.1 billion Euros (exports to the world), down from 1.6 billion Euros and 39.5 billion Euros respectively in 2018.

Other potential determinants of Greek exports to the U.S. include the trade disruption brought about by the COVID-19 pandemic and the exchange rate of the Euro vis-a-vis the USD and other currencies in conjunction with the inflation rate differential (real effective exchange rate). The real broad effective exchange rate index for Greece over the last 25 years[2] is displayed in Figure 2.[3] Although this index has fluctuated considerably, it has remained relatively stable for 2018-2021. This suggests that any changes in the overall competitiveness of Greek exporters were rather limited over the period of additional tariffs. We note that using as control group the set of products which were both exported to the U.S. and excluded from tariffs has the benefit of implicitly controlling for COVID-19 and real exchange rate

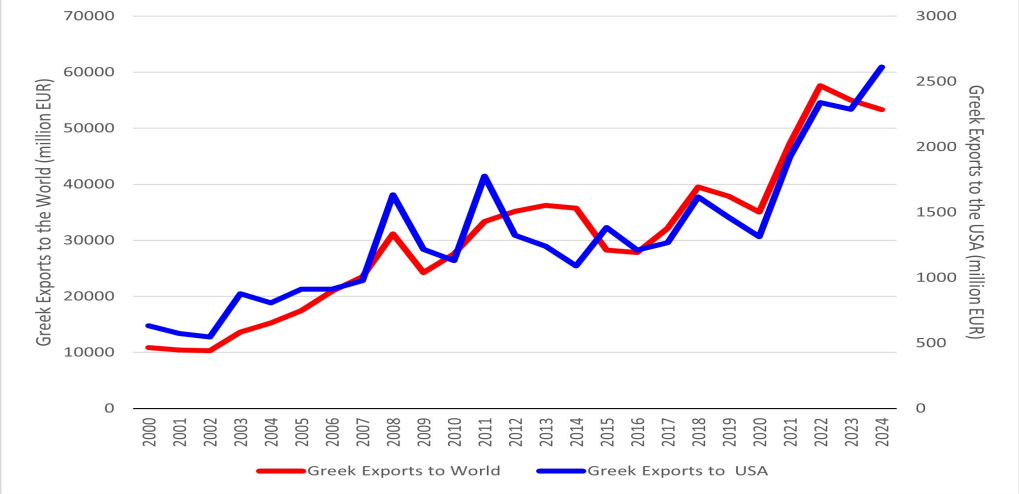
[1]The strategies can be classified into two broad categories.The first category of tariff avoidance strategies emphasizes the differentiation of a product's characteristics to comply with those excluded from tariffs. For example, a type of wine could be excluded from Section 301 tariffs if its alcohol content were above 14%. The second refers to the country of origin which is distinct from the country of export.For example, if country A is in the list of countries for which a tariff is imposed and country B is not, then exporters from country A can import the product from country B, carry out packaging in country A with a label declaring that the country of origin is country B (excluded from tariffs), and export it to the U.S.

[2]From FRED, https://fred.stlouisfed.org/

[3]This index is calculated as a weighted average of bilateral exchange rates adjusted by relative consumer prices.

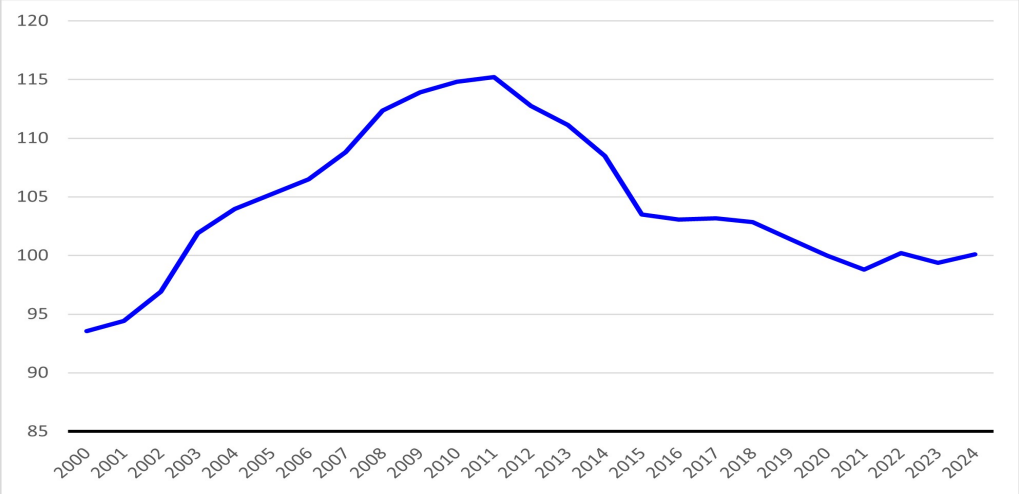
effects.[4]

Figure 1: Greek Exports to the USA and the World



Notes: In this Figure, we present the evolution of Greek exports (expressed in million euros) to the USA (blue line) and the world (red line) as recorded by the UN COMTRATE database.

Figure 2: Real Broad Exchange Rate for Greece



Notes: In this Figure, we present the evolution of the real broad exchange rate for Greece as recorded in the FRED database.

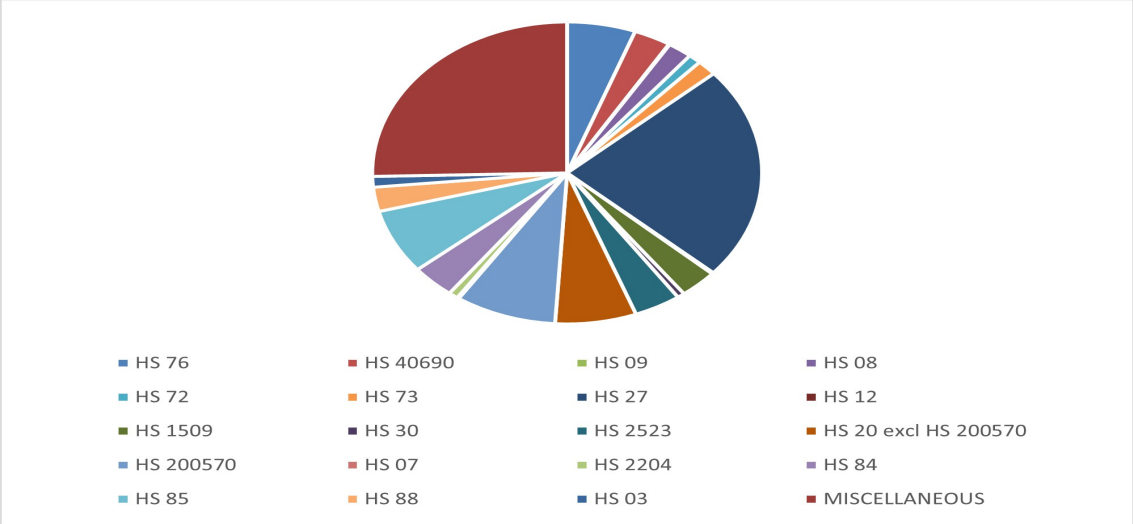
[4]For instance, a Greek product exported to the U.S. may face competition in the U.S. market from another homogeneous good produced in a country whose currency is being devalued vis-a-vis the Euro. In this case, the Greek exporting firm faces an adverse exchange rate exposure, which affects either the firm's profit margin or export market share or both.

4 Industry-level analysis

4.1 Industries and HS codes

We consider 20 product-categories exported from Greece to the U.S. over the period 2000-2024. For 2024, the value of exports of these 20 products to the U.S. was 1.98 billion Euros representing 76% of the value of total exports to the U.S.[5] Figure 3 presents the percentage of the value of exports of each of these 20 products in terms of the value of total exports to the U.S. in 2024.

Figure 3: Greek Exports to the US by Product Category



Notes: In this Figure, we present the share of each product category - based on the HS classification - in Greek exports to the USA in 2024.

Table 1 reports the HS code for each of the 20 industries (product-categories) considered and the corresponding nomenclature.

[5]Importantly, for 2024, approximately 89.7 million Euros worth of exports from Greece to the U.S. are unclassified, namely in the category "commodities not specified according to kind" (HS 99). If we deduct this value of unclassified exports from the total value of exports to the U.S., the 2024 percentage of the value of exports to the U.S. covered herein to the total value of classified exports to the U.S. is approximately 80%.

Table 1: HS code, product-category description, and short reference

HS code	Product-category definition	Short reference
03	Fish ... and other aquatic invertebrates	Fish
07	Edible vegetables, ... tubers	Vegetables
08	Edible fruits and nuts	Fruit
09	Coffee, tea, mate, and spices	Coffee - Tea
12	Oil seeds ... fodder	Oil seeds
20 excl 200570	Preparations of vegetables[a], ... excluding olives	Prep of veg excl olives
2204	Wine of fresh grapes, ... other than that of heading 2009	Wine
2523	Portland cement,... in the form of clinkers	Cement
27	Mineral fuels, ... mineral waxes[b]	Mineral fuels
30	Pharmaceutical products	Pharmaceuticals
68	Stone, plaster ... similar materials, articles thereof	Materials
72	Iron and steel	Steel
73	Articles of iron or steel	Steel articles
76	Aluminum and articles thereof[c]	Aluminum
84	Machinery and mechanical appliances, ..., parts thereof [d]	Mechanical appliances
85	Electrical machinery ... and accessories ...[e]	Electrical machinery
88	Aircraft, spacecraft, and parts thereof	Aircraft parts
200570	Olives, Prepared Or Preserved ..., Not Frozen	Olives
1509	Olive oil and its fractions, ... not chemically modified	Olive oil
040690	Other cheese	Feta-cheese

[a]Products with HS codes 200830 did not incur the 25% additional tariff (based on https://ustr.gov/issue-areas/enforcement/section-301-investigations/search). However, this code there are no available data for exports from Greece to the U.S. in COMTRADE.

[b]Products with HS codes 271091 and 271099 in this category did not incur the 25% additional tariff (based on https://ustr.gov/issue-areas/enforcement/section-301-investigations/search). However, for HS 271091 there are no available data, and for HS 271099 the 2024 value of exports was 2716 Euros, very small and thus negligible.

[c]Products with HS code 76072050 did not incur the 25% tariff (based on https://ustr.gov/issue-areas/enforcement/section-301-investigations/search) . However, for this HS, there are no Greek export value data on COMTRADE. (For HS 760720, the 2024 export value was 21142 Euros, very small and thus negligible).

[d]Products with HS code HS 846810 (hand-held blow torches) did not incur the 25% tariff (based on https://ustr.gov/issue-areas/enforcement/section-301-investigations/search) . However, for this HS, there are no Greek export value data on COMTRADE.

[e]Products with HS code 85073080, 850730, 85369060, 853950, and 853929 did not incur the 25% tariff (based on https://ustr.gov/issue-areas/enforcement/section-301-investigations/search). Data for 85073030, 850730,853950, and 85369060 are not available on COMTRADE. For 852929, the 2024 export value was very small (3.246 Euros) and thus negligible.

Table 2 reports the annual average value of exports to the U.S. per product-category (HS code) for the period 2000-2024.

Table 2: Annual average value of Greek exports to the U.S., 2000 - 2024 (million Euros)

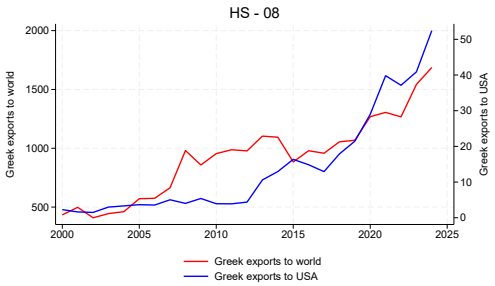
HS code	**Annual average value of exports 2000 - 2024 (million Euros)**
03	18.4
07	1
08	14
09	1
12	2
20 excl 200570	60
2204	10
2523	65
27	320
30	2
68	23
72	7
73	74
76	80
84	28.3
85	71.8
88	57.5
200570	100
1509	30
040690	27

Figure 4 presents the evolution of the value of Greek exports to the U.S. and to the world per HS code.

Figure 4: Greek Exports by Product Category: USA VS World - Part 1

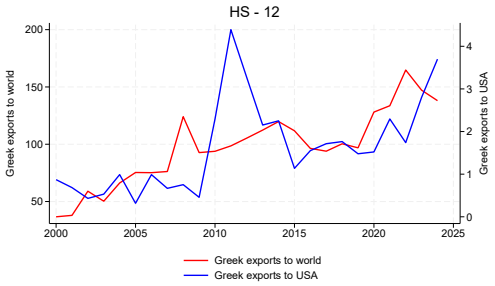
(a) Fish

(b) Vegetables

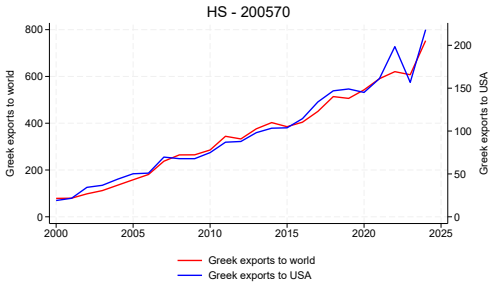


(c) Fruit

(d) Coffee & Tea

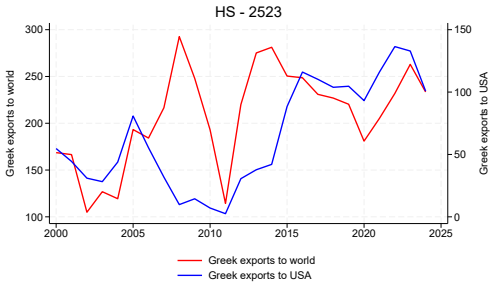


(e) Oil seeds



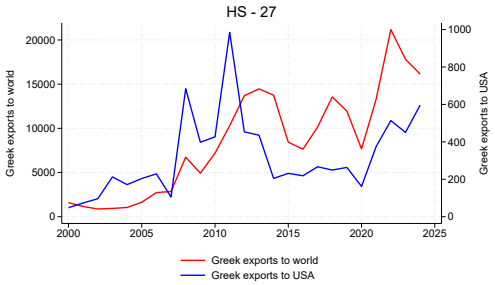
(f) Prep of veg excl olives

(g) Wine

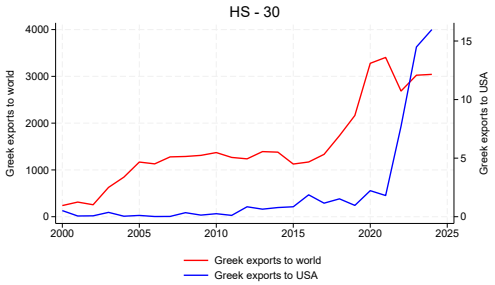


(h) Cement

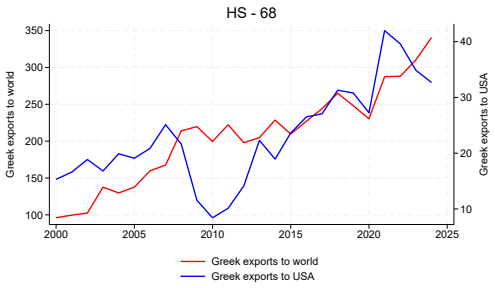
Figure 4: Greek Exports by Product Category: USA VS World - Part 2



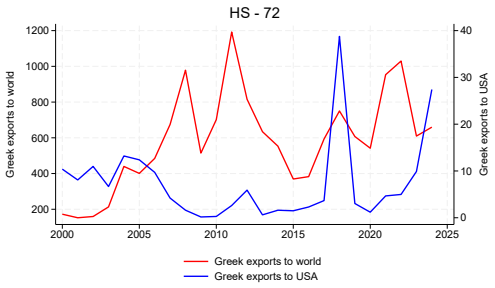
(i) Mineral fuels



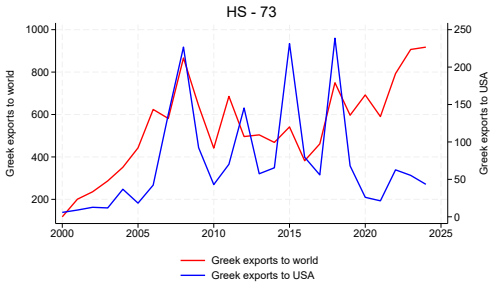
(j) Pharmaceuticals



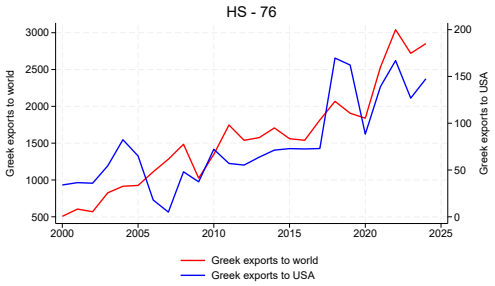
(k) Materials



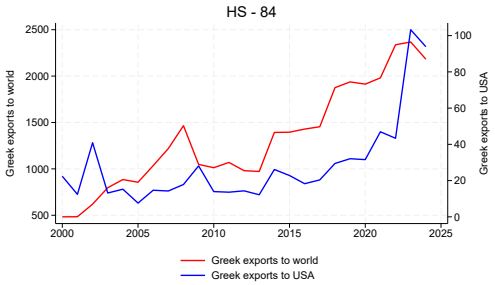
(l) Iron and steel



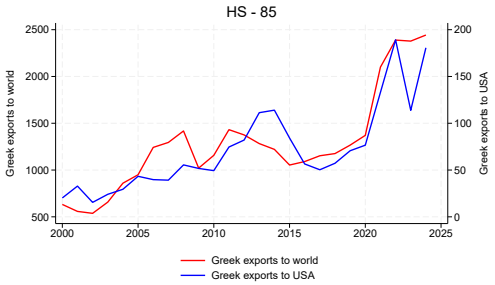
(m) Steel articles



(n) Aluminum

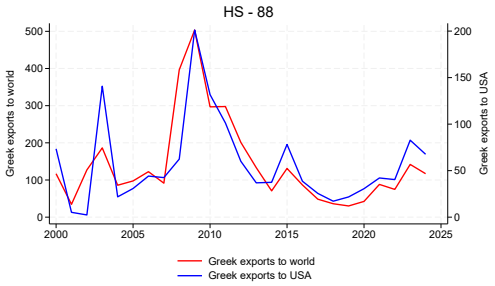


(o) Mechanical appliances

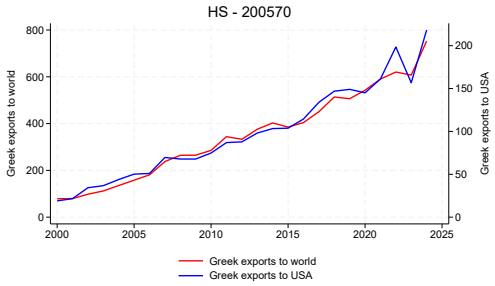


(p) Electrical machinery

Figure 4: Greek Exports by Product Category: USA VS World - Part 3

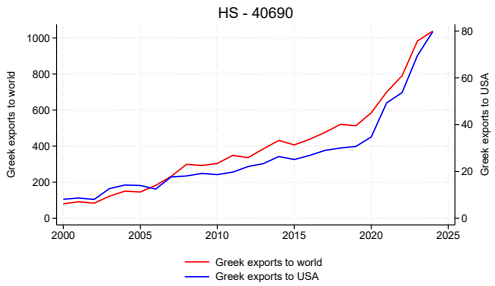


(q) Aircraft parts



(r) Olives

(s) Olive oil



(t) Feta-cheese

Note: The Figure presents the evolution of Greek exports to the world (red line, left axis) and to the United States (blue line, right axis) from 2000 to 2024, disaggregated by product category using the Harmonized System (HS) classification. Each subfigure corresponds to a specific HS code sector.

4.2 Data and the empirical model

We compile a panel data set covering the period 2000-2021 and comprising the annual value of exports from Greece to the U.S. for each of the 20 industries (product-categories) outlined above. Given that the additional tariffs were removed in 2021, we set 2021 as the end of the sample.

Of the 20 industries considered, 17 are used to define the treatment group, namely those products affected by additional tariffs. Three products are used to define the control group, namely the group of products excluded from the additional tariffs. The latter group includes olives, olive oil, and feta cheese. The data set has a total of 440 observations (22 years, 20 industries). We assume that additional tariffs are imposed at a single *switch-on* year, denoted D^*. In the baseline, we set $D^* = 2018$, so the treatment period is 2018–2021 (i.e., treatment turns on in 2018 and remains on thereafter, rather than being a single-date intervention). Some additional tariffs were imposed in 2019, which motivates an alternative coding with $D^* = 2019$, yielding a treatment period of 2019–2021.[6] The treatment indicator is coded as $D_{it} = 1$ for treated units in all $t \geq D^*$ and 0 otherwise, consistent with a standard "switch-on and stay-on" difference-in-differences design.

The group of 17 product-categories subject to additional tariffs is denoted as the T (treated) group, and the control group as the NT (non-treated) group. The dependent variable is the log value of bilateral exports from Greece to the U.S. To estimate the average causal effect of the imposition of additional tariffs we define the average treatment effect on the treated set of products (ATET) as follows,

$$\text{ATET} = \left(\hat{Y}_{T,t\geq D^*} - \hat{Y}_{NT,t\geq D^*}\right) - \left(\hat{Y}_{T,t<D^*} - \hat{Y}_{NT,t<D^*}\right) \tag{1}$$

To estimate ATET, a two-way fixed model is considered. A dummy variable $D(g,t)$ is defined, based on whether an observation belongs in group T after 2018 or not. The two-way (time and group) fixed effects model is:

$$Y_{i,g,t} = \gamma_i + \gamma_t + \delta D(g,t) + \epsilon_{i,g,t} \tag{2}$$

where i refers to a product-category (HS code), g=1 and g=0 for T and NT respectively, $D(g,t) = 1$ for 2018-2021. In this model[7], ATET is given by δ [8]. An important assumption underlying the use of the difference-in-differences model is that of parallel trends tested using a Wald test.

[6] As a robustness check, we also estimate the model for the 2019-2021 treatment period. The results are by and large qualitatively similar to those reported below.

[7] Group fixed effects have been replaced by the cross-section effects per product (HS code).

[8] Cross-section cluster-robust standard errors are used.

4.3 Results

Results for the whole set of 17 industries. The empirical results for the 17-industry panel are reported in Table 3 (for the 2000-2021 period) and Table 4 (for the more recent 10-year 2012-2021 period).

Table 3: Empirical results for the whole panel of 17 industries, 2000 - 2021

ATET	Test for Parallel Trends
-0.21	-1.51
(-1.36)[a]	[0.13][b]

[a] t-statistic in parenthesis
[b] p-value in squared brackets

Table 4: Empirical results for the whole panel of 17 industries, 2012 - 2021

ATET	Test for Parallel Trends
-0.12	-1.43
(-1.00)[a]	[0.16][b]

[a] t-statistic in parenthesis
[b] p-value in squared brackets

For the 2000-2021 period, the null hypothesis of parallel trends cannot be rejected at the 5% level. The average post-2018 impact on the value of exports for the **whole group** of 17 industries, compared to pre-2018 was -21% and statistically insignificant (t-statistic = -1.36). For the more recent 2012-2021 period, the parallel trends hypothesis cannot be rejected as well. The estimated average tariff impact was negative, -12%, and again statistically insignificant.

These results reveal some rather weak evidence of a negative tariff-driven impact on the export values of several product-categories exported from Greece to the U.S. We report results for each industry to explore potential heterogeneity on the impact of tariffs across industries.

Results for individual industries. We next turn to estimating the average 2018-2021 impact on export values of tariffs (ATET) for **each** of the 17 industries (product-categories, HS codes). Given that for an unbiased estimate of ATET the parallel trend assumption should be valid, we identify the period for which the null hypothesis of parallel trends cannot be rejected and carry out the ATET estimation

for that specific period. The corresponding estimation period for each product-category, the estimated ATET, and the test for the parallel trends hypothesis for the corresponding period are reported in Table 5.

Table 5: Empirical results for **each** industry

HS code	Short reference, estimation period	ATET[a]	Test for parallel trends[b]
03	Fish, 2008-2021	-0.51 (-7.26)	-0.29 [0.77]
07	Vegetables, 2008 - 2021	0.22 (3.22)	-1.59 [0.11]
08	Fruit, 2013 - 2021	0.33 (25.94)	-1.42 [0.16]
09	Coffee - Tea[c]	-	-
12	Oil seeds, 2000 - 2021	-0.40 (-6.45)	0.29 [0.77]
20 excl 200570	Prep of vegetables excl olives, 2008 - 2021	-0.15 (-2.13)	-0.60 [0.55]
2204	Wine, 2012 - 2021	-0.22 (-5.38)	-1.56 [0.12]
2523	Cement, 2015 - 2021	-0.24 (-7.65)	0.88 [0.38]
27	Mineral fuels, 2000 - 2021	-0.79 (-12.63)	-0.49 [0.62]
30	Pharmaceuticals, 2012 - 2021	0.10 (2.58)	1.27 [0.20]
68	Materials, 2008 - 2021	0.10 (1.39)	0.82 [0.41]
72	Steel[d]	-	-
73	Steel articles, 2010 - 2021	-0.85 (-13.28)	-2.00 [0.05][e]
76	Aluminum, 2004 - 2021	0.37 (6.18)	0.08 [0.93]
84	Mechanical appliances, 2010 - 2021	0.22 (3.49)	-0.85 [0.39]
85	Electrical machinery, 2000 - 2021	-0.34 (-5.40)	-0.22 [0.82]
88	Aircraft parts[f]	-	-

[a] t-statistics in parentheses.

[b] p-values in squared brackets.

[c] For this HS code, the hypothesis of parallel trends was rejected for any reasonable estimation period, hence we do not report the estimated ATET.

[d] For this HS code, the hypothesis of parallel trends was rejected for any reasonable estimation period, hence we do not report the estimated ATET.

[e] Marginally significant.

[f] For this HS code, the hypothesis of parallel trends was rejected for any reasonable estimation period, hence we do not report the estimated ATET.

As shown in Table 5, of the 17 industries considered, the parallel trends hypothesis cannot be rejected for 14 industries. The estimation of ATET varies amongst these 14 industries. For 8 industries there was an average decline in export values for the post-2018 period whilst for 6 industries there was an average increase. Industries which faced a negative impact (decline in average export value) include Fish (HS 03), Cement (HS 2523), Oil seeds (HS 12), Preparations of vegetables excluding olives (HS 20 excl 200570), Wine (HS 2204), Mineral fuels (HS 27), Steel articles (HS 73), and Electrical machinery (HS 85). It is worth noting that 5 industries (HS 07, 08, 30, 76, and 84) including fruit, vegetables, pharmaceuticals, aluminum, and mechanical appliances experienced a statistically significant average **increase** in export values during the post-2018 period. In addition, for 1 industry (HS 68), there is a statistically insignificant increase. Exporters in these industries appear to have

successfully overcome the burden of tariffs, echoing the tariff avoidance strategies pinpointed in the literature and discussed above.

Expanding the control group A possible concern in the difference-in-differences framework relates to violations of the Stable Unit Treatment Value Assumption (SUTVA). In the baseline setting, the control group comprised three closely related agri-food industries (olives, olive oil, and feta). These products may not constitute a clean counterfactual if spillovers or substitution effects are present. For instance, tariffs imposed on treated industries could indirectly affect non-treated ones through expectations or market sentiment - e.g., by increasing perceived policy uncertainty and leading exporters in unaffected sectors to reduce or postpone shipments to the U.S. (see Baker et al., 2016). Such responses would attenuate the estimated treatment effect by lowering exports in the control group and thus biasing results toward zero.

To mitigate this concern, we expand the donor pool to include a broader set of unaffected EU industries. Specifically, the number of control industries increases from three to twenty, while the treatment group remains at seventeen. This enlarged control sample reduces the likelihood that all control industries are exposed to similar spillovers and allows for a cleaner estimation of the counterfactual export trajectory. The extended specification therefore provides a more robust test of the causal impact of U.S. tariff measures on EU exports.

Table 6: Extended Control Group

HS code	**Product-category definition**	**Short reference**
1509	Olive oil and its fractions, not chemically modified	Olive oil
040690	Other cheese (incl. feta)	Feta/Other cheese
200570	Olives, prepared or preserved, not frozen	Olives
48	Paper and paperboard; articles thereof	Paper
93	Arms and ammunition; parts and accessories thereof	Arms
19	Preparations of cereals, flour, starch or milk; pastrycooksâ products	Cereal preparations
83	Miscellaneous articles of base metal	Base metal articles
33	Essential oils and resinoids; perfumery and cosmetics	Perfumes and cosmetics
71	Natural or cultured pearls, precious stones and metals	Jewelry
44	Wood and articles of wood; wood charcoal	Wood
34	Soap, detergents, lubricating preparations, waxes	Soap and detergents
90	Optical, photographic, medical or measuring instruments	Optical instruments
32	Tanning or dyeing extracts; pigments and paints	Pigments and paints
91	Clocks and watches and parts thereof	Watches
89	Ships, boats and other floating structures	Ships and boats
64	Footwear, gaiters and the like	Footwear
26	Ores, slag and ash	Ores and slag
96	Miscellaneous manufactured articles	Misc. manufactures
20	Preparations of vegetables, fruit, nuts or other plant parts	Processed vegetables
24	Tobacco and manufactured substitutes	Tobacco

Table 6 lists the extended control group used in the analysis. The first three rows

- industries 1509 (olive oil), 040690 (other cheese), and 200570 (olives) - appear in bold to indicate the original control group. The remaining seventeen industries extend the donor pool across diverse sectors (e.g., paper, wood, footwear, metals, machinery/instruments, ships, jewelry, tobacco) that were less likely to be indirectly affected by tariffs.

Table 7: Empirical results for the extended control group

HS code	Short reference, estimation period	ATET[a]
03	Fish, 2008–2021	-0.73 (-3.25)
07	Vegetables, 2008–2021	0.41 (2.86)
08	Fruit, 2013–2021	0.46 (2.05)
09	Coffee - Tea[b]	-
12	Oil seeds, 2000–2021	-0.72 (-3.21)
20 excl 200570	Prep of vegetables excl olives, 2008–2021	-0.37 (-2.65)
2204	Wine, 2012–2021	-0.51 (-2.25)
2523	Cement, 2015–2021	-0.63 (-2.79)
27	Mineral fuels, 2000–2021	-1.18 (-5.24)
30	Pharmaceuticals, 2012–2021	0.37 (2.63)
68	Materials, 2008–2021	0.12 (0.55)
72	Steel[b]	-
73	Steel articles, 2010–2021	-1.26 (-5.62)
76	Aluminum, 2004–2021	0.40 (6.09)
84	Mechanical appliances, 2010–2021	0.12 (5.30)
85	Electrical machinery, 2000–2021	-0.62 (-2.76)
88	Aircraft parts[b]	-
	17 Industries, 2000-2021	-0.51 (-1.81)

[a] t-statistics in parentheses.

[b] For this HS code, the hypothesis of parallel trends was rejected for any reasonable estimation period, hence we do not report the estimated ATET.

The results obtained using the extended donor pool are reported in Table 7. Overall, they are qualitatively unchanged relative to the baseline control group. At the bottom of the table, the ATET for all 17 treated industries, is marginally significant at the 10% significance level. When we look at industries separately, eight show an average *decline* in export values after 2018: Fish (HS 03), Cement (HS 2523), Oil seeds (HS 12), Preparations of vegetables excluding olives (HS 20, excl. 200570), Wine (HS 2204), Mineral fuels (HS 27), Steel articles (HS 73), and Electrical machinery (HS 85). Six industries exhibit an average *increase*; among these, five - Vegetables (HS 07), Fruit (HS 08), Pharmaceuticals (HS 30), Aluminum (HS 76), and Mechanical appliances (HS 84) - record a statistically significant increase, while Materials (HS 68) shows a positive but statistically insignificant change.

Exploring anticipatory and delayed effects A standard concern in estimating tariff impacts on exports is that firms may adjust shipments before duties take effect if they anticipate forthcoming restrictions. Evidence from the 2018-2019 U.S. tariff episode generally finds little systematic anticipation or delay in exports (Fajgelbaum et al., 2020; Carter et al., 2020). Much of this literature exploits monthly data to align responses with announcement and implementation dates. By contrast, our data are annual, so we assess potential firm adjustments using one-year lead and lag of the treatment.

To test for anticipatory and delayed effects in our setting, we re-estimate equation (2) augmenting the baseline treatment indicator with its one-period lead and lag. This specification is designed to capture pre-treatment adjustments following the Section 301 investigation of unfair trade practices in 2017 and heightened policy salience from subsequent public statements, as well as short-run persistence (or reversal) one year after treatment.

Table 8: Empirical results for anticipatory effects

HS code	Short reference, estimation period	Lag	ATET[a]	Lead
03	Fish, 2008–2021	-0.16 (-2.5)	-0.34 (-9.64)	0.18 (1.98)
07	Vegetables, 2008–2021	-0.06 (-0.98)	0.10 (2.79)	-0.13 (-1.52)
08	Fruit, 2013–2021	0.36 (5.51)	0.22 (6.42)	0.26 (2.92)
09	Coffee - Tea[b]	–	-	–
12	Oil seeds, 2000–2021	-0.13 (-2.03)	-0.72 (-2.06)	-0.26 (-2.90)
20 excl 200570	Prep of vegetables excl olives, 2008–2021	0.18 (2.89)	-0.31 (-2.90)	-0.45 (-4.96)
2204	Wine, 2012–2021	-0.16 (-2.39)	-0.73 (-2.08)	-0.24 (-2.67)
2523	Cement, 2015–2021	-0.21 (-0.32)	-0.61 (-4.58)	0.59 (6.59)
27	Mineral fuels, 2000–2021	-0.16 (-2.43)	-1.17 (-4.82)	-0.68 (-7.53)
30	Pharmaceuticals, 2012–2021	-0.01 (-0.17)	0.18 (5.05)	1.06 (11.85)
68	Materials, 2008–2021	-0.05 (-0.73)	0.05 (1.30)	-0.30 (-1.30)
72	Steel[b]	–	-	–
73	Steel articles, 2010–2021	-1.70 (-6.01)	-1.35 (-8.61)	-0.66 (-7.37)
76	Aluminum, 2004–2021	-0.32 (-4.87)	0.74 (9.28)	-0.26 (-2.85)
84	Mechanical appliances, 2010–2021	0.11 (1.63)	0.27 (7.65)	-0.51 (-5.71)
85	Electrical machinery, 2000–2021	0.28 (4.27)	-0.28 (-2.82)	-0.71 (-7.89)
88	Aircraft parts[b]	–	-	–
	17 Industries, 2000–2021	-0.26 (-1.17)	-0.24 (-1.39)	-0.26 (-1.59)

[a] t-statistics in parentheses.

[b] For this HS code, the hypothesis of parallel trends was rejected for any reasonable estimation period, hence we do not report the estimated ATET.

In Table 8, the contemporaneous ATET is similar in magnitude and significance to the baseline in equation (2). At the aggregate level (17 industries), neither the lead nor the lag is statistically different from zero, indicating no aggregate evidence of systematic anticipation or delay. At the same time, industry-level patterns are heterogeneous. For example, Fish (HS03) and Cement (HS2523) display positive

leads alongside negative contemporaneous effects (with Fish also showing subsequent weakness), consistent with higher shipments in the year prior and lower during the tariff period. Several sectors - Oil seeds (HS12), Wine (HS2204), Mineral fuels (HS27), Steel articles (HS73), and Electrical machinery (HS85) - exhibit negative leads together with negative ATETs, indicating earlier reductions in shipments and continued weakness during treatment. By contrast, Fruit (HS08) and Pharmaceuticals (HS30) show positive and significant leads and ATETs, pointing to increases that begin before and persist throughout the treatment period. Mixed patterns arise for Processed vegetables (HS20; decline before treatment, partial rebound afterward) and Aluminium (HS76; decline before, strong increase during, then reversal), while Materials (HS68) shows no meaningful dynamics. Overall, anticipatory behavior is absent in the aggregate but present in specific sectors, with the direction of timing adjustments varying across industries.

Overall, the lead-lag specification reveals no aggregate anticipatory or delayed effect, but it does indicate non-trivial timing adjustments at the sector level. Twelve sectors have statistically significant lead coefficients and nine have significant lag coefficients. Positive leads suggest that some sectors increased shipments in the year before tariffs (e.g., advancing orders), whereas negative leads point to early contraction. Similarly, significant lags indicate short-run persistence or partial reversal one year after treatment. Given the annual frequency these patterns are plausibly driven by inventory and order-timing decisions under heightened policy uncertainty. Importantly, the contemporaneous ATET remains similar in magnitude and significance to the baseline across all 17 industries, so allowing for timing adjustments does not overturn our main result.

Competitiveness control Variation in sector-specific competitiveness may not be fully captured by time fixed effects. To address this, we augment the baseline with an industry-level measure of Greece's real effective exchange rate (REER) relative to an EU benchmark, using the industry-specific REER from RIETI dataset.[9] Table 9 reports the mapping of these eight sectors to the HS codes of our analysis. Therefore, the competitiveness proxy is available only at a broad industry level, with multiple HS codes mapping to a single RIETI sector, reducing granularity and probably leaving within-sector heterogeneity unobserved. We construct the EU benchmark as the fixed-weight average across the available EU countries at the same industry level. We then re-estimate our baseline specification (2) including this relative competitiveness measure as a control. The impact of tariffs on exporting remains significant across all 17 treated industries, indicating that the main results are not driven by industry-level competitiveness shifts vis-à-vis EU peers. Results are reported in the

[9]However, this dataset has two limitations. First, REER is available only for eight broad sectors. Second, the RIETI coverage for the EU is limited to a subset of member states: Germany, France, Italy, Spain, Greece, Belgium, Netherlands, Norway and Sweden.

Appendix (Table A1).

Table 9: Mapping of RIETI industries to HS codes used in the analysis

RIETI industry	**HS codes in our study**
Food	03, 07, 08, 09, 12, 20 (excl. 200570), 2204, 200570, 1509, 0406
Non-Metal	2523, 68
Petroleum	27
Chemical	30
Metal	72, 73, 76
General Machinery	84
Electrical Equipment	85
Transport Equipment	88

Substitution of export destination We assess whether there is a substitution of export destination for the 8 industries for which we found a negative impact in the value of exports to the U.S. over the period 2018-2021. Substitution of the U.S. market with another export destination would occur if, for each of these 8 industries, there were an increase in the value of exports to the rest of the world over the same period. This would be indicative of exporters' flexibility to replace the exports lost to the U.S. with exports to the rest of the world, thereby minimizing the overall impact of U.S. tariffs.

To assess this hypothesis, a similar DiD model was estimated, where the dependent variable is now the (log) value of exports to the rest of the world for each of the 8 industries (HS codes), namely Fish (HS 03), Cement (HS 2523), Oil seeds (HS 12), Preparations of vegetables excluding olives (HS 20 excl 200570), Wine (HS 2204), Mineral fuels (HS 27), Steel articles (HS 73), and Electrical machinery (HS 85).

We find that for 5 industries (HS 03, HS 20 excl 200570, HS 2523, HS 27, and HS 85) the parallel trends hypothesis cannot be rejected. For 4 industries (namely for HS 03, HS 20 excl 200570, HS 27, and HS 85), we did find an increase in the value of exports to the rest of the world which is, however, statistically insignificant. This finding may be interpreted as tentative evidence that some exporters in specific industries did have some flexibility to avoid U.S. tariffs.

Limitations of this empirical analysis arise from the 2-digit HS aggregation of the industries considered. For example, HS 20, which includes products which incurred additional tariffs, also includes the sub-category of HS 200570 for which such tariffs did not apply. A second limitation refers to the imperfect matching between the NT (control) group and the T group.

The above findings suggest that when we focus on the whole set of industries, the impact of tariffs across all industries is negative but statistically insignificant. Focusing on each industry, and thus moving to a more granular level of analysis,

reveals a richer set of results, thereby uncovering which industries experienced a negative impact and which industries experienced a positive impact relative to the control group of industries.

The last observation justifies our attention to an even more granular level, namely to firm-level analysis. Given that the previous result refers to the average impact, the individual impact faced by some exporting firms in a specific industry may be different from the individual impact faced by other firms in the same industry. To put it differently, some firms may have higher flexibility to follow tariff avoidance strategies thus partially or fully neutralizing any individual tariff-driven impact, whilst others may not.

5 Firm-level analysis

5.1 Data and Variables

We use proprietary firm-level data from ICAP Group S.A., a private research company that collects and maintains detailed balance sheet and income statement data for S.A. ("Société Anonyme" - Public Limited Companies) and Limited-Liability (Ltd) companies in Greece, along with their establishment date, location and ownership status, for credit risk evaluation and management consulting.[10] In addition to financial data, ICAP provides firms' four-digit NACE Rev. 2 industry codes, which we use to classify firms and link them to HS product-level trade data. ICAP provides data for total sales, but not separately domestic and export sales. To this end, we complemented with company-level information on export revenue from the Orbis Europe database, distributed by Bureau van Dijk.[11]

A distinctive feature of our dataset is the extensive coverage of unlisted firms– 99.9% of firms in our sample are not publicly traded. This characteristic introduces substantial heterogeneity, which is particularly valuable for studying export performance.

A natural question is whether our firm-level dataset is a good representation of the aggregate Greek economy. Table 10 summarizes the coverage in our data compared to the aggregate economy between 2015 and 2020. The column "Output" in the table reports the ratio of gross output aggregated from our sample relative to the aggregate quantity in Eurostat as reported in its Structural Business Statistics (SBS).[12] The column "Exports of Goods" reports the ratio of revenue from exports of goods aggregated from our sample to the aggregate quantity in Eurostat's National Accounts. As Table 10 shows, the coverage in our sample is consistently high for gross output (it averages roughly 57.1% percent of the aggregate economy), but somewhat lower for goods exports.

[10] In Greece, the law requires all S.A. and Ltd companies to file annual financial statements with the national business register (the "General Electronic Commercial Registry - G.E.MI.") and ICAP strives to cover the universe of these firms.

[11] Orbis Europe is a comprehensive pan-European financial database containing standardized firm-level accounting information, including balance sheet data, profit and loss statements, and financial ratios. To fully account for "company type", we supplement our analysis with data from Compustat.

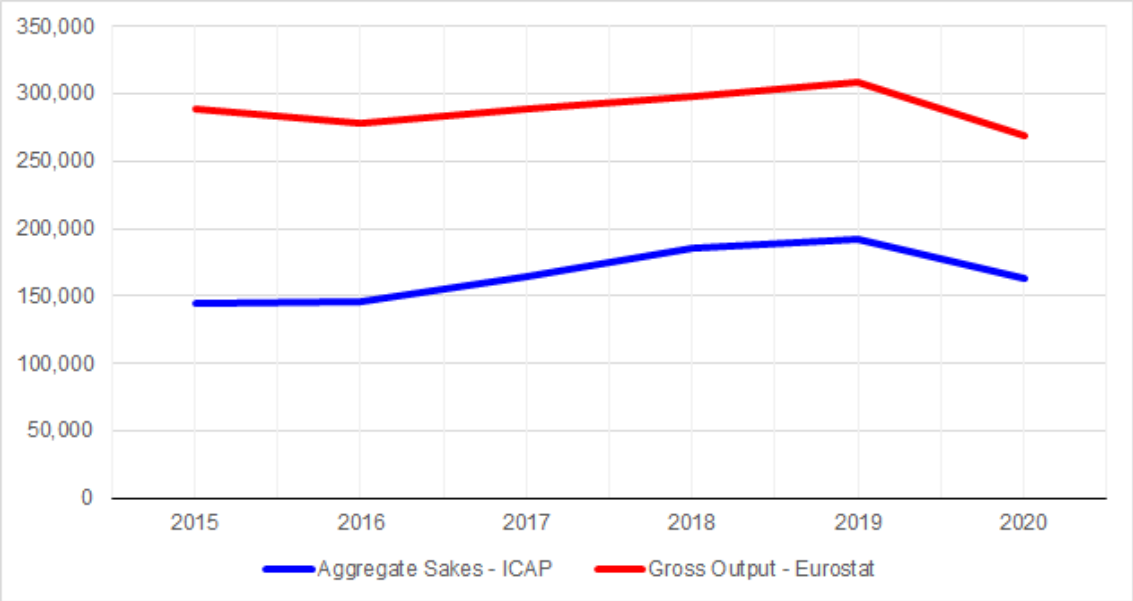
[12] Gross output is defined by the Bureau of Economic Analysis (BEA) as: "a measure of an industry's Sales or receipts, which can include Sales to final users in the economy (GDP) or Sales to other industries (intermediate input). At the firm-level, gross output is measured by aggregate gross sales, deflated by the Producer Price Index (PPI).

Table 10: Gross Output coverage in our sample relative to Eurostat

Year	Gross Output	Exports of Goods
2015	55.8%	42.8%
2016	56.2%	46.8%
2017	56.9%	44.9%
2018	57.3%	43.2%
2019	57.8%	44.8%
2020	58.6%	49.2%
Average	57.1%	45.3%

Notes: This Table summarizes the coverage in our data for Greece between 2015 and 2020.

Figure 5: Aggregate Gross Output in our Dataset and Eurostat (SBS)



Notes: In this Figure, we compare the evolution of aggregate gross output (expressed in million euros) in our dataset with the same aggregate as recorded by Eurostat (Structural Business Statistics-SBS).

Figure 5 displays the aggregate gross output in our ICAP data set and the respective aggregate recorded by Eurostat for the period 2015-2020. The gross output series in our sample closely tracks the Eurostat counterpart.

We restrict our sample to industries that account for the top 40 Greek export products to the United States. Before proceeding with the formal empirical analysis,

we apply several selection criteria. We exclude companies that did not have complete records on our explanatory variables and firms-years with negative sales. To control for the potential influence of outliers, we excluded observations in the 0.5% of the upper and lower tails of the distribution of the regression variables. These cut-offs aim to eliminate extraordinary firm shocks, or coding errors. Further, we remove firms that report only consolidated accounts, to avoid double-counting firm and subsidiaries or operations abroad. For most firms in ICAP and Orbis, unconsolidated statements are reported and consolidated accounts are provided when available. Our final panel has an unbalanced structure with a total of 231,287 annual observations (firm-years) on 59,288 Greek firms.

5.2 Econometric Methodology and Identification

The primary objective of this study is to examine whether the implementation of U.S. tariffs in 2018, targeting specific industries within the Greek economy, affected exporting activity and total sales of firms operating in those sectors.

We adopt a difference-in-differences approach (Angrist and Pischke, 2009), employing the following econometric specification:

$$y_{it} = \alpha_s + \alpha_t + \alpha_i + \beta_1 \cdot (Treated_i \times Post_t) + \beta_2 \cdot (X_i \times Post_t) + \varepsilon_{it} \qquad (3)$$

The dependent variable, y_{it}, is alternatively defined as: (i) the natural logarithm of export value of firm i in period t; (ii) export share, measured as the ratio of export sales to total sales for firm i; or (iii) the natural logarithm of total sales (domestic and export) of firm i in period t. Export and sales values are deflated using the Producer Price Index and the Export Goods Deflator, both sourced from Eurostat.

The sample consists of Greek firms operating in industries corresponding to the top 40 export products from Greece to the United States. The variable $Treated_i$ is a binary indicator equal to 1 if firm i belongs to an industry affected by the 2018 U.S. tariffs, and 0 otherwise. The variable $Post_t$ equals 1 for the post-tariff period (2018-2020), and 0 for the pre-tariff period (2015-2017).[13]

X_i is a vector of firm-level control variables - including firm size (logarithm of total assets), firm age, cash holdings scaled by total assets, leverage (total debt to assets), and profitability (return on assets) - all measured in 2017 to mitigate endogeneity concerns. These controls interact with the $Post_t$ dummy to account for their time-varying effects.

We include industry (α_s), firm (α_i), and year (α_t) fixed effects to control for unobserved heterogeneity across industries, firm-specific time-invariant characteristics, and common economy wide trends that affect all firms equally. Standard errors are

[13] Given that the first wave of tariffs was introduced in 2018, followed by additional tariff measures in 2019, we define an alternative post-treatment dummy equal to one for the 2019-2020 period.

clustered at the firm level to account for within-firm autocorrelation and heteroscedasticity.[14]

The coefficient of interest, β_1, captures the differential effect of the U.S. tariffs on firms in affected industries relative to those industries not subject to tariffs. A positive (negative) and statistically significant estimate of β_1 would suggest that, following the imposition of tariffs, firms in industries impacted by tariffs exhibited a positive (negative) impact on export performance and/or sales performance compared to firms in industries not affected by the same tariffs.

An important identification assumption for the difference-in-differences strategy is that of *parallel trends*: in the absence of treatment (i.e. imposition of tariffs), the outcome variables for the treated and control firms would have evolved similarly over time. To assess the validity of this assumption, we conducted a pretreatment trends test by restricting the sample to the pre-tariff period (2015-2017) and estimating an auxiliary model that interacts a time trend with the treatment indicator. The results of this test, presented in the Appendix, support the assumption of parallel trends between the treated and control groups. In addition, we complement our analysis with an entropy balancing test, also included in the Appendix.

Treated and control groups. We classify firms into treated and control groups based on their industry of operation. Firms in industries directly affected by the tariffs constitute the treated group, while those in industries producing goods among the top 40 Greek exports to the U.S. that were not subject to the 2018-19 imposition of U.S. tariffs serve as the control group.[15] Following the distinction of the HS codes for each of the industries (product-categories) (Section 4, Table 1), we identify the relevant NACE Rev. 2 industries that correspond to affected and non-affected HS product codes. Table 11 provides the closest possible correspondence between them.[16] In the following sections, we construct an "extended control group" and a "baseline control group". The former classification uses a larger set of industries not subject to tariffs, while the latter focuses on a smaller set of industries that were not affected by tariffs and dominate Greece's exports to the U.S. These groupings allow us to formally assess, through econometric analysis, the impact of the tariff

[14]To assess the robustness of our results, we re-estimate the baseline specification using two alternative clustering approaches for standard errors:(a) clustering at the industry level, and (b) two-way clustering at the firm and industry-year levels. This two-way clustering approach is more robust than clustering at the firm level only, as it accounts for common industry-year shocks (e.g., tariff implementation) that may induce cross-sectional dependence among firms (Cameron, Gelbach, and Miller, 2011). As the results remain unchanged, they are omitted for brevity. A selection of key findings is provided in footnote *a*.

[15]By expanding the sample of firms in the control group to incorporate industries that are likely exempt from tariffs, we use data from 40 products instead of 20.

[16]There is no direct mapping between the Harmonized System (HS) codes and the Statistical Classification of Economic Activities in the European Community (NACE Rev.2), due to fundamental structural differences between the two classification systems.

shock on firms' exporting performance.

Table 11: Classification of Treated and Control Industries by HS and NACE Codes

Treated		Extended Control		Baseline Control	
HS	**NACE**	**HS**	**NACE**	**HS**	**NACE**
2204	11.02	15	10.41-42	15	10.41-42
76	24.42	04	10.51	04	10.51
72	24.10, 24.31-34	48	17.11-12, 17.21-29	20	10.32
73	24.20, 24.51-54	93	25.40	200570	01.26
20 (excl.200570)	10.39	19	10.61-62, 10.71-72		
27	19.10, 19.20, 23.91, 23.99	200570	01.26		
25.23	23.51–23.52	88	30 (excl. 30.30)		
09	10.81-84	83	25.71-73		
08/12	01.11-19, 01.21-29	33	20.53		
07	01.13	71	32.12		
30.30	21.10	44	16.10		
88	30.30	34	16.29		
03	10.20	90	26.70		
85	27, 28	32	20.30		
68	23.61-69	91	26.52		
94	31.01-09	89	30.11		
12	01.11	64	15.20		
84	25.21-29, 25.30	26	07.10, 07.21, 07.29		
		96	32.91, 32.99		
		20	10.32		
		24	12.00		

Table 12 presents descriptive statistics for firms belonging in the treated and control groups. Columns 1 to 4 report the means and standard deviations of the main variables of interest. Column 5 displays p-values from tests of equality of means between the two groups. The distribution of most firm-level characteristics differs significantly between treated and control firms, as reflected in the statistically significant differences. Firms in tariff-affected industries are less likely to begin exporting, as indicated by lower exports (extensive), but those that export tend to be more export-oriented on average, with higher export shares and export values, and lower domestic sales compared to firms in the control group. Additionally, treated firms are larger in size, more leveraged, and exhibit higher sales growth than firms in the control group.

Table 13 presents export-related statistics for treated firms before and after 2018. Preliminary results suggest that, following the implementation of tariffs, firms in affected industries are less likely to initiate exporting and experience a decline in total sales. These changes are statistically significant. While both export values and export shares exhibit a decline after 2018, the changes are not statistically significant.

To leverage the granularity of our data, we conduct a univariate analysis of

Table 12: Descriptive Statistics

	Control (N=2791)		Treated (N=1975)		
Variable	**Mean** (1)	**SD** (2)	**Mean** (3)	**SD** (4)	**p-value** (5)
Exports (extensive)	0.383	0.486	0.361	0.480	0.002
Export share	0.411	0.336	0.463	0.350	0.000
Exports (value)	18.186	1.812	18.509	1.919	0.000
Total Sales	18.392	1.994	18.364	2.207	0.376
Domestic Sales	18.007	2.032	17.904	2.216	0.001
Firm size	18.727	1.853	18.854	1.978	0.000
Firm age	23.812	20.281	23.906	21.314	0.757
Leverage	0.103	0.264	0.118	0.279	0.000
Cash	0.113	0.164	0.098	0.152	0.000
Sales growth	0.0016	0.041	0.0037	0.052	0.007
Observations	11,340		7,847		19,187

Notes: This Table reports summary statistics of the main variables across treated and control firms. *Exports*, *domestic* and *total Sales* are expressed in logarithms. *Leverage* is defined as the debt-to-assets ratio. *Cash* denotes the cast-to-assets ratio. *Firm size* is the logarithm of total assets. *Exports*(*extensive*) is a dummy variable that equals 1 if firm i has a positive amount of exports in year t, and zero otherwise.

Table 13: Treated firms' Exporting activity

	Pre-Tariffs (Year<2018)		Post-Tariffs (Year>=2018)		
Variable	**Mean**	**SD**	**Mean**	**SD**	**p-value**
Exports (extensive)	0.383	0.486	0.328	0.469	0.000
Exports (million EUR)	2020.27	8477.41	1721.13	8473.43	0.125
Export share	0.471	0.348	0.451	0.352	0.149
Domestic Sales	17.936	2.218	17.852	2.211	0.116
Total Sales	18.424	2.192	18.269	2.228	0.003
Observations	4711		3136		

export-related firm characteristics within each affected industry, comparing the periods before and after 2018. This analysis provides preliminary evidence on the exporting behavior of affected firms. For most firms, we do not identify statistically significant differences (evaluated at the mean) when comparing the pre- and post-2018 periods. The statistics in Table 14 indicate a statistically significant decline in the probability of exporting (i.e. exports (extensive)) within tariff-exposed industries, specifically for "Other processing and preserving of fruit and vegetables" (NACE 10.39/HS20), "Manufacture of sugar, cocoa, chocolate and sugar confectionery" (NACE 10.81-10.82/HS09) and "Manufacture of wine from grape" (NACE 11.02/HS2204). Additionally, both export revenues and total sales decrease following the introduction of tariffs, with the reduction being statistically significant for firms in the "Other processing and preserving of fruit and vegetables" industry (NACE 10.39/HS20).

Table 14: Exporting activity by NACE Rev.2 Code

	Pre-Tariffs (Year<2018)		Post-Tariffs (Year>=2018)		
Variable	**Mean**	**SD**	**Mean**	**SD**	**p-value**
NACE 10.39					
Exports (extensive)	0.673	0.470	0.607	0.489	0.004
Exports (value)	19.393	1.656	19.221	1.670	0.081
Export share	0.682	0.325	0.662	0.336	0.307
Exports (million EUR)	5144.93	10300.03	4124.31	9336.18	0.028
Domestic Sales	17.871	2.435	17.796	2.362	0.517
Sales	19.315	1.891	19.076	2.037	0.012
Observations	767		1038		
NACE 24.10, 24.31-34					
Exports (extensive)	0.304	0.465	0.439	0.501	0.165
Exports (value)	19.874	2.167	19.245	2.446	0.427
Export share	0.333	0.272	0.327	0.327	0.956
Exports (million EUR)	4462.33	13508.56	6995.70	22382.30	0.501
Domestic Sales	19.561	2.844	19.946	2.635	0.478
Sales	19.723	2.863	20.204	2.619	0.376
Observations	46		57		
NACE 24.20, 24.51-54					
Exports (extensive)	0.466	0.503	0.382	0.490	0.349
Exports (value)	16.912	1.252	16.563	1.594	0.378
Export share	0.247	0.279	0.246	0.287	0.989
Exports (million EUR)	183.03	346.19	158.66	419.80	0.725
Domestic Sales	18.838	1.684	18.509	2.278	0.370

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	Pre-Tariffs (Year<2018)		Post-Tariffs (Year>=2018)		
Variable	**Mean**	**SD**	**Mean**	**SD**	**p-value**
Sales	19.023	1.580	18.672	2.234	0.323
Observations	58		64		
NACE 24.42					
Exports (extensive)	0.625	0.487	0.523	0.502	0.187
Exports (value)	19.722	1.808	20.144	1.935	0.274
Export share	0.569	0.298	0.593	0.294	0.693
Exports (million EUR)	10613.42	28809.38	14336.09	39761.73	0.493
Domestic Sales	19.656	1.990	19.873	1.923	0.479
Sales	20.388	2.026	20.554	2.023	0.601
Observations	80		86		
NACE 10.81-10.82					
Exports (extensive)	0.615	0.489	0.486	0.502	0.043
Exports (value)	18.663	1.917	18.696	1.713	0.916
Export share	0.354	0.239	0.321	0.241	0.425
Exports (million EUR)	2587.59	5476.54	1931.76	4681.93	0.310
Domestic Sales	19.213	1.631	18.644	2.084	0.021
Sales	19.537	1.712	18.881	2.197	0.012
Observations	104		146		
NACE 11.02					
Exports (extensive)	0.424	0.495	0.351	0.478	0.036
Exports (value)	17.510	1.566	17.393	1.467	0.501
Export share	0.313	0.204	0.305	0.203	0.719
Exports (million EUR)	513.69	1831.46	335.82	1301.34	0.111
Domestic Sales	17.554	1.977	17.425	1.908	0.363
Sales	17.745	2.045	17.588	1.978	0.283
Observations	337		450		
NACE 01.11-19, 01.21-29 (excl.01.26)					
Exports (extensive)	0.200	0.414	0.074	0.263	0.136
Exports (value)	18.153	0.114	18.165	0.317	0.951
Export share	0.200	0.0001	0.200	0.0001	0.934
Exports (million EUR)	153.67	319.93	59.44	223.55	0.177
Domestic Sales	15.326	2.754	16.447	2.218	0.108
Sales	15.370	2.828	16.468	2.250	0.122

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	Pre-Tariffs (Year<2018)		Post-Tariffs (Year>=2018)		
Variable	**Mean**	**SD**	**Mean**	**SD**	**p-value**
Observations	138		546		
NACE 19.10-19.20					
Exports (extensive)	0.343	0.477	0.282	0.451	0.312
Exports (value)	18.927	1.606	18.742	1.950	0.664
Export share	0.367	0.283	0.382	0.299	0.828
Exports (million EUR)	2061.800	7345.600	2362.700	10977.400	0.813
Domestic Sales	19.674	2.743	19.181	2.345	0.147
Sales	19.879	2.745	19.371	2.359	0.136
Observations	99		135		
NACE 23.61-69					
Exports (extensive)	0.061	0.239	0.060	0.238	0.969
Exports (value)	18.499	1.654	18.032	2.083	0.314
Export share	0.269	0.270	0.247	0.248	0.721
Exports (million EUR)	203.400	1394.300	180.100	1352.900	0.775
Domestic Sales	18.116	1.598	18.168	1.650	0.599
Sales	18.144	1.627	18.194	1.675	0.614
Observations	493		680		
NACE 31.01-09					
Exports (extensive)	0.226	0.419	0.234	0.424	0.753
Exports (value)	16.946	1.811	17.089	1.601	0.507
Export share	0.225	0.215	0.224	0.209	0.984
Exports (million EUR)	193.528	870.235	187.639	758.152	0.905
Domestic Sales	17.377	1.694	17.283	1.832	0.388
Sales	17.448	1.751	17.357	1.891	0.418
Observations	487		607		

Notes: The NACE Rev.2 industry codes are defined as follows: 10.39: Other processing and preserving of fruit and vegetables; 24.10: Manufacture of basic iron and steel and of ferro-alloys; 24.31-34: Manufacture of other products of first processing of steel; 24.20: Manufacture of tubes, pipes, hollow profiles and related fittings, of steel; 24.51-54: Casting of metals; 24.42:Aluminum production; 10.81-10.82: Manufacture of sugar, cocoa, chocolate and sugar confectionery; 11.02: Manufacture of wine from grape; 01.11-19:Growing of non-perennial crops; 01.21-29: Growing of perennial crops except for Growing of oleaginous fruits; 19.10-19.20: Manufacture of coke oven products and Manufacture of refined petroleum products; 23.61-69: Manufacture of articles of concrete, cement and plaster; 31.01-09: Manufacture of furniture.

5.3 Results

Exporting activity. We estimate the difference-in-difference specification in equation (3) and present the results in Table 15. Columns 1-4 present results for the "extended control group" and columns 5-8 for the "baseline control group". In columns 1, 2, 5, and 6 the dependent variable is the logarithm of the value of export sales, and in columns 3, 4, 7, and 8 it is the ratio of export sales to total sales. The coefficient on *Treated*Post* is insignificant across all specifications in columns 1-4 indicating that tariffs had no significant effect on the export value and export share for export-oriented firms in the affected industries. Although firms may respond to tariffs by shifting production and sales toward domestic markets, we find no statistically significant evidence of such adjustments in our sample. Similarly, while the tariff shock could be expected to disproportionately affect smaller, younger, or highly leveraged firms, potentially forcing them out of exporting, we do not observe such patterns.[17] Turning to columns 5-8, where the control group is restricted to industries explicitly excluded from tariffs (e.g., olives, olive oil and cheese), we find that affected firms experienced a 10% increase in export value relative to firms in the control group.[18] This result remains statistically significant even after incorporating firm-level controls alongside firm-industry-time fixed effects. However, we find no significant difference in export share between affected and non-affected firms, suggesting that treated firms increased proportionally export sales and domestic sales. A potential concern when examining the effect of tariffs on firm exports is that firms anticipating future trade restrictions may adjust their export activity in advance, leading to a spurious correlation between tariff exposure and subsequent export performance. To address this concern, we implement a lead-lag specification that exploits the timing of tariff announcements and implementation. The time span of our data does not allow for additional leads and lags without a substantial loss of observations. Nonetheless, our baseline results remain robust when including one lead and one lag of the treatment variable, suggesting that anticipatory or delayed effects do not change the findings.[19]

The impact of tariffs in export performance in specific industries. Given that some exporters may respond differently to tariffs, as suggested by the preliminary analysis in Table 11, we re-estimate our main specification separately for each industry within the treated group to evaluate the resilience of firms in tariff–exposed industries.[20] Table 16 presents the results for industries that show a significant

[17] Results are not reported for brevity.

[18] As presented in Table 7, the baseline control consists of the following NACE industries: 10.41-42, 10.51, 10.32, 01.26

[19] To save space, these results are not reported.

[20] Results for NACE 11.02, 21.10, and 30.30 are omitted due to a limited number of observations.

Table 15: Impact of tariffs on export performance

	Extended control group				**Baseline control group**			
	Log exports		**Export sales/total sales**		**Log exports**		**Export sales/total sales**	
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
*Treated*Post*	0.038	0.034	-0.001	-0.001	0.101***	0.098***	-0.001	-0.001
	(0.027)	(0.026)	(0.001)	(0.001)	(0.036)	(0.036)	(0.001)	(0.001)
size		-0.001		0.001		-0.003		0.002
		(0.012)		(0.001)		(0.013)		(0.001)
age		-0.003***		0.001		-0.003***		0.001
		(0.001)		(0.001)		(0.001)		(0.001)
cash		-0.063		-0.002		-0.200		0.002
		(0.109)		(0.002)		(0.131)		(0.001)
lev		0.113		-0.002		0.072		-0.001
		(0.078)		(0.002)		(0.106)		(0.001)
ROA		0.431**		-0.003		0.209		0.002
		(0.167)		(0.002)		(0.239)		(0.001)
Sales_growth		6.885***		0.016		8.225***		-0.001
		(1.234)		(0.012)		(2.282)		(0.003)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,112	6,399	7,112	6,399	3,936	3,497	3,936	3,497
R-squared	0.969	0.973	1.000	1.000	0.973	0.975	1.000	1.000

Notes: Robust standard errors clustered at the firm level in parentheses.[a] All regressions include firm, industry (NACE 2), and year fixed effects. *** p<0.01, ** p<0.05, * p<0.1.

[a]When we apply the two-way clustering (firm and industry*year), the corresponding coefficients (standard errors) on *Treated*Post* reported in columns 1, 2, 5 and 6 are 0.033 (0.031), 0.030 (0.028), 0.07** (0.034) and 0.061** (0.032), respectively.

impact of tariffs on export performance.[21] Specifically, the effect of tariffs is positive and statistically significant for "Aluminum production" (NACE 24.42) and "Manufacture of furniture" (NACE 31.01-09) under both the extended and baseline control group specifications. Additionally, the impact is also positive and significant for " Other processing and preserving of fruit and vegetables" (NACE 10.39) and "Manufacture of sugar, cocoa, chocolate and sugar confectionery" (NACE 10.81-89) when using the baseline control group.

Specifically, the value of aluminum exports (NACE 24.42/HS76) increased between 23% and 29% relative to the extended control group and baseline control group, respectively. This effect is likely driven by tariff exclusion requests for flat-rolled (HS 7606) and foil (HS 7607) aluminum products, which were granted to offset limited domestic production capacity in the U.S (Georgitzikis et.al., 2021).[22] However, for export shares we find no statistically significant difference between treated and control group firms. A plausible explanation is that firms in affected industries may have been able to increase prices due to market power with no negative impact on export volumes. These firms could be more resilient, with a greater ability to absorb or pass on tariff costs, allowing them to grow in both export and domestic markets.[23] To examine whether domestic sales experienced a change, we re-estimate specification 3 using the log of domestic sales as the outcome variable. Our results (not reported for brevity) indicate that firms producing "aluminum products" and "other food products", increased domestic sales by 19% and 12%, respectively.

Table 16: Impact of tariffs on export performance by industry

	Extended control group				**Baseline control group**			
	Log exports		**Export sales/total sales**		**Log exports**		**Export sales/total sales**	
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
HS76/NACE2442								
*Treated*Post*	0.228**	0.237**	-0.0004	-0.001	0.285**	0.290***	-0.0005	-0.0002
	(0.113)	(0.108)	(0.001)	(0.001)	(0.115)	(0.107)	(0.0004)	(0.0002)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,389	3,978	4,389	3,978	1,506	1,335	1,506	1,335
R-squared	0.965	0.970	0.999	0.999	0.9685	0.9715	0.9998	1.0000
HS20087010/NACE 1039								

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[21] Table A2 in the Appendix reports results for the remaining industries, which are statistically insignificant.

[22] According to the European Commission (2021), Greece recorded a 77% increase in aluminum exports to the U.S. between 2018 and 2019, with export values rising by USD 54 million. Consistent with this, our firm-level data show a steady increase in export revenues following 2018.

[23] Due to data limitations, we are unable to assess the direct effects on exports to the U.S., exports to non-U.S. countries, the number of country-product pairs a firm exports to, or changes in product prices.

Table 16 – continued from previous page

	Extended control group				Baseline control group			
	Log exports		Export sales/total sales		Log exports		Export sales/total sales	
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
*Treated*Post*	0.0252	0.0286	-0.00033	-0.00064	0.0821**	0.0835**	-0.00044	-0.00012
	(0.0347)	(0.0359)	(0.00057)	(0.00061)	(0.0408)	(0.0415)	(0.00035)	(0.00007)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	5,433	4,890	5,433	4,890	2,549	2,246	2,549	2,246
R-squared	0.9676	0.9721	0.9993	0.9995	0.9637	0.9674	0.9999	1.0000
HS235/NACE10.81-10.89								
*Treated*Post*	0.0492	0.0458	-0.0003	-0.0004	0.1074*	0.1223**	-0.0004	-0.00006
	(0.0488)	(0.0385)	(0.0006)	(0.0004)	(0.0535)	(0.0440)	(0.0004)	(0.00008)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,897	4,434	4,897	4,434	2,013	1,790	2,013	1,790
R-squared	0.9656	0.9709	0.9990	0.9993				
HS94/NACE 31.01-31.09								
*Treated*Post*	0.1173**	0.1301***	-0.00027	-0.00064	0.1746***	0.1884***	-0.0003	-0.00008
	(0.0456)	(0.0437)	(0.00057)	(0.00053)	(0.0508)	(0.0526)	(0.00034)	(0.00013)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,542	4,083	4,542	4,083	1,659	1,440	1,659	1,440
R-squared	0.9651	0.9697	0.9990	0.9993	0.9698	0.9712	0.9998	1.0000

Notes: Robust standard errors clustered at the firm level in parentheses. Also see notes in Table 10. All regressions include firm, industry (NACE 2), and year fixed effects. *** p<0.01, ** p<0.05, * p<0.1.

Gross sales Table 17 presents estimation results for the econometric specification (3) using *firm total sales* as the dependent variable.[24] Results are shown for the whole panel of 18 industries (see Table 11) as well as for specific industries most directly affected by the implementation of tariffs.[25] The first and second columns report the difference-in-differences (DiD) estimates based on the baseline control group and extended control group respectively.

To strengthen the validity of our estimation strategy, we also constructed a matched sample, retaining only those firms from the extended control group that closely resemble the treated firms.[26] The DiD estimates for this matched sample are

[24] All estimation results are robust to alternative inference procedures, including clustering of standard errors at the industry level and two-way clustering at the firm and industry-year levels.

[25] We also tested the parallel trends assumption separately for each industry. In all cases, the interaction term between the treatment indicator and the time trend was statistically insignificant, indicating no evidence of differential pre-treatment trends at the industry level.

[26] Matching was conducted based on six firm-level characteristics: firm size, export intensity, leverage (measured by the debt-to-assets ratio), profitability (measured by return on assets), liquidity (cash-to-assets ratio), and the capital-to-labor ratio. For a more detailed description of the matching methodology see the Appendix.

Table 17: Impact of tariffs on total sales

Industry	Baseline Control Group (1,423 firms)	Extended Control Group (4,339 firms)	Extended Control Group (matched sample) (3,799 firms)
NACE 24.42 (Aluminum)	0.318***	0.307***	0.277***
	(0.047)	(0.046)	(0.042)
NACE 24.10, 24.31-34 (Iron and Steel)	0.261	0.270	0.252
	(0.163)	(0.173)	(0.174)
NACE 24.20, 24.51-54 (Articles of Iron and Steel)	-0.287**	-0.324**	-0.330***
	(0.145)	(0.136)	(0.132)
NACE 11.02 (Wine)	0.013	-0.004	0.058
	(0.055)	(0.035)	(0.042)
NACE 19.10-19.20 (Mineral Fuels)	0.089	0.028	0.067
	(0.057)	(0.039)	(0.093)
NACE 10.39 (Fruits and Vegetables)	0.025	-0.008	-0.004
	(0.043)	(0.035)	(0.037)
NACE 10.81-10.82 (Other Food Products)	0.074	0.031	0.029
	(0.059)	(0.049)	(0.042)
NACE 0.11-0.12 (Crops)	0.372	0.313	0.323
	(0.252)	(0.221)	(0.217)
NACE 23.61-69 (Concrete, Cement and Plaster Articles)	0.081	0.053	0.036
	(0.070)	(0.067)	(0.064)
NACE 31.01-09 (Furnitures)	0.161**	0.125**	0.132***
	(0.070)	(0.056)	(0.044)
All Affected Industries	0.053	0.032	0.035
	(0.046)	(0.026)	(0.026)

Notes: This table presents the estimation results for the econometric specification (3) with firm sales as the dependent variable. The model contains firm, industry and year fixed effects and a set of firm-level control variables. The first column of the table shows the difference-in-differences (DiD) estimates, $\hat{\beta}_1$, based on the baseline control group, described in Section 5.3. The second column uses the extended control group, and the third column applies DiD estimation on a matched sample based on six firm characteristics. Robust standard errors clustered at the firm level are reported in parentheses. Significance levels: *** for $p < 0.01$, ** for $p < 0.05$, * for $p < 0.1$.

reported in the third column of Table 17.

The most pronounced negative effect is observed in the "Articles of Iron and Steel" industry. Exposure to the U.S. tariffs in this industry is associated with a statistically significant decline in firm sales, ranging from approximately 28.7% to 33.0%, depending on the control group used. These estimates are significant at the 1% or 5% level across all specifications, suggesting a robust and sizeable adverse effect. While the estimates for export value are negative, they are not statistically significant. The observed decline in total sales may therefore reflect reduced domestic demand or other factors beyond direct exports to the U.S. Given the sector's international exposure, trade frictions could still play a role, but the evidence does not allow us to isolate this channel with certainty.

In contrast, two sectors - "Aluminum" and "Furnitures" - exhibit positive and

statistically significant treatment effects. For "Aluminum", the estimated increase in sales ranges from 3.7% to 7.7%, while for "Furnitures", the effect lies between 8.6% and 9.7%, all significant at conventional levels. These positive effects may reflect trade diversion mechanisms, whereby Greek exporters benefited from reduced competition as other countries' exports to the U.S. faced more adverse effects of US tariffs. Alternatively, these gains could stem from favorable product positioning, supply chain adjustments, or indirect substitution effects in global markets. While these sectoral dynamics warrant further investigation, the results underscore the heterogeneity of the tariff impact across industries.

As with exports, the firm-level sales results - reported in Table 17 - are robust to including one-year leads and lags of $\text{Treated}_i \times \text{Post}_t$ in regression (3); we find no evidence of anticipatory or delayed effects at the firm level.[27]

6 Recommendations for export trade and export credit finance policies

The empirical results suggest that the 2018-2019 U.S. tariffs had an overall insignificant impact on total Greek goods exports to the U.S. However, this average effect masks considerable heterogeneity across industries. Some sectors experienced pronounced declines in exports, while others demonstrated resilience. Given the importance of exports to GDP growth and the current account balance, it is critical to identify and support industries that are more vulnerable to adverse trade shocks.

The fact that several industries were negatively affected underscores the need to facilitate export market diversification. For many firms, existing inventories or idle capacity may offer positive net present value (NPV) in alternative markets. However, redirecting exports is not costless. Firms face fixed entry costs in new markets, including the establishment of commercial relationships, promotional expenditures, compliance with local regulatory requirements, and adjustments such as repackaging or relabeling products.

A key policy response should be the design and implementation of cash-flow-based export finance schemes to assist firms that lack the internal liquidity or operational flexibility to respond swiftly to trade shocks. These schemes would support exporters facing immediate financing needs as they pivot toward new international markets. The banking sector has a critical role to play in this transition, by delivering appropriate financial instruments that help firms maintain liquidity and stability during the adjustment phase. In parallel, export grants and public export credit guarantees can further ease the burden. Such tools can lower the barriers to market entry, enhance access to trade finance, and mitigate risks related to working capital constraints, insurance needs, and procedural complexity.

[27] Supplementary estimates are available upon request.

In addition to financing support, temporary relief measures-such as reductions in payroll or energy taxes-can provide immediate cost alleviation for affected exporters, helping preserve employment and operational continuity. Moreover, training initiatives aimed at enhancing workforce skills in production, logistics, and trade compliance could bolster firms' adaptability and long-term competitiveness in a changing trade environment. Targeted incentives, including subsidies or tax credits, may also help offset increased tariff-related costs and maintain price competitiveness without burdening consumers.

Consequently, policy efforts should prioritize the reinforcement of Export Credit Greece (ECG)-formerly known as ECIO-as a central pillar in the export support architecture. ECG's mandate includes offering financial assistance, credit insurance, and guarantees to facilitate the internationalization of the Greek economy and strengthen exporters resilience to external shocks.[28]

[28]ECG is the state-owned export credit corporation supervised by the General Secretariat for International Economic Relations and Openness of the Ministry of Foreign Affairs.

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Appendix

Results with Competitiveness Control

Table A1: AET estimates for model (2) with a competitiveness control

HS code	Short reference, estimation period	ATET[a]
03	Fish, 2008–2021	-0.62 (-5.36)
07	Vegetables, 2008–2021	0.31 (3.68)
08	Fruit, 2013–2021	0.32 (12.47)
09	Coffee - Tea[b]	-
12	Oil seeds, 2000–2021	-0.52 (-4.12)
20 excl 200570	Prep of vegetables excl olives, 2008–2021	-0.27 (-2.06)
2204	Wine, 2012–2021	-0.35 (-4.89)
2523	Cement, 2015–2021	-0.29 (-7.92)
27	Mineral fuels, 2000–2021	-0.98 (-8.63)
30	Pharmaceuticals, 2012–2021	0.15 (2.76)
68	Materials, 2008–2021	0.14 (1.36)
72	Steel[b]	-
73	Steel articles, 2010–2021	-0.75 (-12.47)
76	Aluminum, 2004–2021	0.32 (5.12)
84	Mechanical appliances, 2010–2021	0.28 (3.82)
85	Electrical machinery, 2000–2021	-0.45 (-3.64)
88	Aircraft parts[b]	-
	17 Industries, 2000-2021	-0.28 (-1.42)

[a] t-statistics in parentheses.

[b] For this HS code, the hypothesis of parallel trends was rejected for any reasonable estimation period, hence we do not report the estimated ATET.

Results for Export Performance by Industry

Table A2: Impact of tariffs on export performance by industry

	Extended control group				**Baseline control group**			
	Log exports		**Export sales/total sales**		**Log exports**		**Export sales/total sales**	
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
HS72/NACE 2410, 2431, 2432, 2433, 2434								
*Treated*Post*	0.145	0.129	-0.00038	-0.00117	0.204	0.194	-0.00047	-0.00026
	(0.084)	(0.066)	(0.00058)	(0.00099)	(0.086)	(0.066)	(0.00037)	(0.00026)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes

Continued on next page

Table A2 – continued from previous page

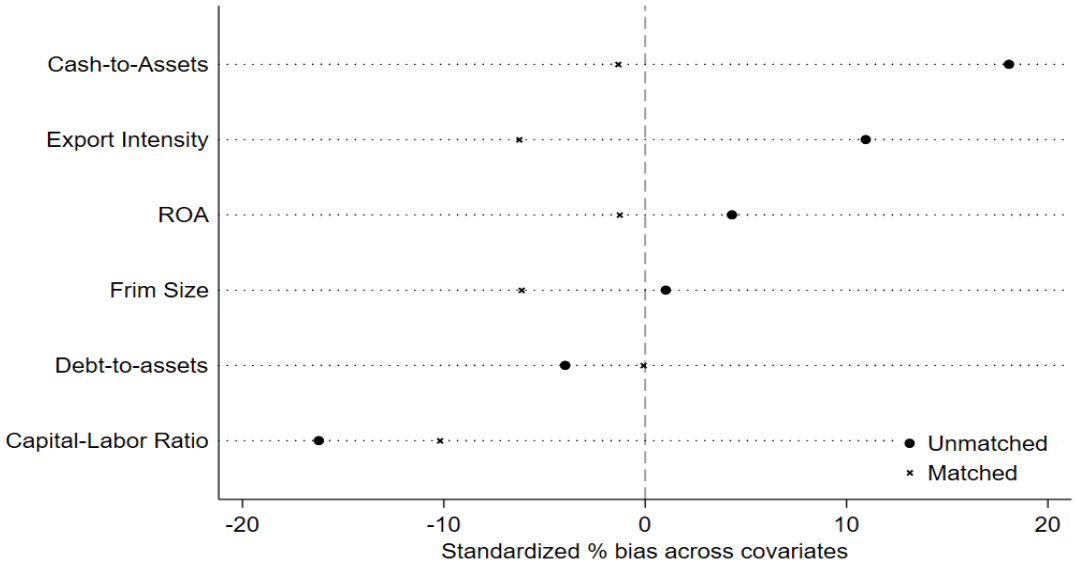
	Extended control group				Baseline control group			
	Log exports		Export sales/total sales		Log exports		Export sales/total sales	
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Observations	4,333	3,924	4,333	3,924	1,450	1,281	1,450	1,281
R-squared	0.965	0.970	0.999	0.999	0.970	0.973	1.000	1.000
HS73/NACE 2420, 2451, 2452, 2453, 2454								
*Treated*Post*	-0.409	-0.470	0.00078	-0.00003	-0.354	-0.446	0.00062	0.00120
	(0.357)	(0.428)	(0.00127)	(0.00171)	(0.357)	(0.431)	(0.00114)	(0.00133)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,347	3,931	4,347	3,931	1,464	1,288	1,464	1,288
R-squared	0.965	0.970	0.999	0.999	0.965	0.968	1.000	1.000
HS2204/NACE 1102								
*Treated*Post*	0.0304	-0.0352	0.00013	-0.00074	0.011	0.013	0.000	0.000
	(0.0523)	(0.0564)	(0.00016)	(0.00069)	(0.053)	(0.059)	(0.000)	(0.000)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,595	4,152	4,595	4,152	1,548	1,360	1,548	1,360
R-squared	0.964	0.969	0.999	0.999	0.985	0.999	0.989	0.999
HS27/NACE 1910, 1920, 2391, 2399								
*Treated*Post*	0.0623	0.0312	-0.00029	-0.00045	0.120	0.109	-0.00044	-0.00011
	(0.0759)	(0.0719)	(0.0006)	(0.0005)	(0.079)	(0.077)	(0.00038)	(0.00011)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,439	4,024	4,439	4,024	1,556	1,381	1,556	1,381
R-squared	0.9653	0.9706	0.9990	0.9993	0.9700	0.9735	0.9998	1.0000
HS08/NACE 1102								
*Treated*Post*	0.237	0.058	-0.00013	-0.00098	0.295	0.107	-0.00024	-0.00009
	(0.178)	(0.149)	(0.00057)	(0.00083)	(0.179)	(0.140)	(0.00042)	(0.00011)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,360	3,939	4,360	3,939	1,477	1,296	1,477	1,296
R-squared	0.9643	0.9698	0.9990	0.9993	0.9676	0.9714	0.9998	1.0000
HS68/NACE 236								
*Treated*Post*	0.0521	0.0395	-0.00035	-0.00096	0.1086	0.0969	-0.00048	-0.00020
	(0.0747)	(0.0765)	(0.00057)	(0.00084)	(0.0777)	(0.0759)	(0.00035)	(0.00016)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,365	3,953	4,365	3,953	1,481	1,310	1,481	1,310
R-squared	0.9651	0.9703	0.9990	0.9993	0.9700	0.9730	0.9998	1.0000

Notes: Robust standard errors clustered at the firm level in parentheses. Also see notes in Table 10. All regressions include firm, industry (NACE2), and year fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Matching

A key step in implementing a successful difference-in-differences approach is the construction of an appropriate control group - that is, firms that were not directly affected by the tariff introduction but are otherwise similar to those operating in tariff-exposed industries prior to the policy change.

Figure A1: Covariate Balance Before and After Propensity Score Matching



Note: This figure illustrates the standardized percentage bias in observed covariates between treated and control firms before (•) and after (×) propensity score matching (PSM). A lower absolute bias after matching indicates improved balance across covariates. The vertical dashed line at zero represents perfect balance.

To ensure comparability between treated and control firms, we employ a propensity score matching (PSM) procedure prior to the main analysis. Specifically, we estimate the probability of treatment - defined as being exposed to the 2018 U.S. tariffs - using a logit model based on pre-treatment firm characteristics, including firm size, leverage, return on assets (ROA), cash holdings, capital-labor ratio, and export status. Each treated firm is matched to its six nearest neighbors in the control group using a caliper of 0.3 to exclude poor-quality matches, and we impose the common support condition. We then assess covariate balance by comparing standardized percentage bias before and after matching. As shown in Figure A1, the matching process substantially reduces imbalances across all covariates, bringing post-matching bias close to zero and thereby improving the internal validity of our empirical strategy.

Parallel Trends Assumption

We estimate the following specification.

$$y_{it} = \alpha_s + \alpha_i + \gamma_1 \cdot Trend_t + \gamma_2 \cdot Treated_i + \gamma_3 \cdot (Treated_i \times Trend_t) + \varepsilon_{it} \quad (1)$$

Here, y_{it} denotes the outcome variable for firm i in year t, as previously defined. $Treated_i$ is a dummy equal to 1 for firms in industries exposed to U.S. tariffs, and $Trend_t$ is a linear time trend. The coefficient γ_3 captures whether treated firms exhibited differential trends relative to the control group before the implementation of tariffs. Industry and firm fixed effects (α_s and α_i) are included to absorb unobserved ex-ante firm heterogeneity, and standard errors are clustered at the firm level.

Table A3: Parallel Trends Test: Pre-treatment Period (2015–2017)

	Log Sales	Log Exports	Export sales/total sales
$\text{Treated}_i \times \text{Trend}_t$	0.025	0.026	0.006
	(0.016)	(0.016)	(0.005)

Notes: Each column reports the estimated coefficient γ_3 on the interaction term $\text{Treated}_i \times \text{Trend}_t$ from econometric specification (1). The dependent variables are log Sales, log exports, and export share, respectively. All regressions include firm and industry fixed effects. Standard errors clustered at the firm level are reported in parentheses.

A statistically insignificant γ_3 provides evidence in support of the parallel trends assumption. Table A3 presents the estimated coefficients γ_3 for each outcome. Across all specifications, the estimated coefficients are small in magnitude and statistically insignificant at conventional levels: 0.025 for Sales (standard error = 0.016), 0.026 for exports (0.016), and 0.006 for export share (0.005). These findings provide no evidence of diverging trends between treated and control firms in the years preceding the tariff implementation, thereby lending strong support to the credibility of our difference-in-differences identification strategy.

Results for Export Performance in the Matched Sample

To robusify our findings, we estimate our baseline model using a matched sample. This approach relies on the identification assumption that treated and control firms exhibited similar export growth trends prior to the implementation of tariffs. Consequently, any post-2018 differences can be attributed to the effects of the tariffs. As shown in Table A4, our results remain consistent, reinforcing the validity of our main findings.

Table A4: Matched sample: Impact of tariffs on export performance

	Extended control group				**Baseline control group**			
	Log exports		**Export sales/total sales**		**Log exports**		**Export sales/total sales**	
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
*Treated*Post*	0.034	0.031	-0.001	-0.001	0.099***	0.094***	-0.001	-0.001
	(0.029)	(0.027)	(0.001)	(0.001)	(0.037)	(0.037)	(0.001)	(0.001)
size		-0.000		0.000		-0.004		0.000
		(0.012)		(0.000)		(0.013)		(0.000)
age		-0.003***		0.000		-0.003***		0.000
		(0.001)		(0.000)		(0.001)		(0.000)
cash		-0.062		-0.002		-0.206		-0.002
		(0.110)		(0.002)		(0.137)		(0.002)
lev		0.115		-0.002		0.076		-0.002
		(0.079)		(0.002)		(0.108)		(0.002)
ROA		0.457**		-0.003		0.244		-0.003
		(0.168)		(0.002)		(0.242)		(0.002)
Sales_ growth		7.265***		0.016		8.679***		0.016
		(1.252)		(0.013)		(2.314)		(0.013)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,297	6,171	6,297	6,171	3,449	3,362	3,449	3,362
R-squared	0.970	0.973	1.000	1.000	0.972	0.975	1.000	1.000

Notes: Robust standard errors clustered at the firm level in parentheses. All regressions include firm, industry (NACE 2), and year fixed effects. *** p<0.01, ** p<0.05

Results for Export Performance using Entropy Balancing

To further test the validity of our findings, we estimate our baseline model using an entropy balancing method. The entropy-balanced DiD uses a stricter estimation sample than our PSM-DiD. Entropy balancing requires complete pre-treatment covariates (in some variants, pre-outcome moments) for each firm to construct balancing weights. Firms with missing 2017 characteristics or insufficient pre years cannot be weighted and are excluded. In addition, we enforce a balanced panel window and discard units with zero-negative weights further reducing observations. Estimates are robust when we (i) relax the target set (e.g., omit pre-trend) and (ii) construct 2017 snapshots using adjacent years, yielding similar treatment effects.

Table A5 reports coefficients on the treatment interaction for the baseline and extended control groups using log exports as the outcome variable. Results closely mirror those from the PSM estimation.

Table A5: Entropy-balanced DiD: Impact of tariffs on export performance

	Extended control group		**Baseline control group**	
	(1)	**(2)**	**(5)**	**(6)**
Treated×*Post*	0.177	0.158	-0.096	-0.158**
	(0.12)	(0.14)	(0.060)	(0.065)
size		-0.008		-0.008
		(0.015)		(0.015)
age		-0.004***		-0.004***
		(0.001)		(0.001)
cash		-0.207		-0.207
		(0.133)		(0.133)
lev		0.075		0.075
		(0.111)		(0.111)
ROA		0.390*		0.390*
		(0.206)		(0.206)
Sales_growth		11.931***		11.931***
		(2.161)		(2.161)
Fixed effects	Yes	Yes	Yes	Yes
Observations	2,970	2,626	2,855	2,626
R-squared	0.976	0.979	0.976	0.979

Notes: The dependent variable is *log of exports*. Robust standard errors clustered at the firm level in parentheses. All regressions include firm, industry (NACE 2), and year fixed effects. *** p<0.01, ** p<0.05