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Drivers of Global Trade: A Product-Level Investigation

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Working Paper 2121

September 2021

11200 SW 8th Street, Miami, Florida 33199

https://economics.fiu.edu/

Drivers of Global Trade:
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September 11, 2021

Abstract

This paper investigates the drivers of global trade at the six-digit product level. The identification is achieved first by estimating the *log-linear* product-level bilateral trade implications of a model and second by aggregating the fitted estimation results across bilateral countries using Taylor series to obtain global measures in *levels* for each product. The empirical results suggest that supply-side effects (capturing production or exporting costs in source countries) contribute to changes in global trade more than six times the demand-side effects (capturing economic activity or preferences in destination countries) and more than ten times the effects of bilateral trade costs (capturing bilateral protectionism measures). Several product-level implications follow.

JEL Classification: F14, F60

Key Words: Global Trade; Product-Level Analysis; Decomposition

Conflict of Interest: The author has no relevant financial or non-financial interests to disclose.

*The author would like to thank the editor Sunghyun Henry Kim and an anonymous referee for their helpful comments and suggestions. The usual disclaimer applies.

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1 Introduction

Global merchandise trade has increased by more than 6 trillion U.S. dollars between 1995 and 2018. This increase is mostly accounted for by products such as machinery/electrical (with a contribution of about 26%), mineral products (with a contribution of about 18%), chemicals and allied industries (with a contribution of about 11%), and transportation (with a contribution of about 11%). Across broad economic categories, trade of intermediate inputs account for about 66% of this increase, whereas trade of capital goods and consumption goods account for about 18% and 16%, respectively.[1] Although these statistics provide useful information on products or categories that drive the global trade, policy making requires knowledge on the economic forces that are responsible for the contribution of these products or categories.

This paper investigates the *economic* drivers of global trade using six-digit product level data covering the years between 1995 and 2018. These economic drivers are identified using implications of a large class of trade models following Allen, Arkolakis, and Takahashi (2020) who have shown that several international trade models imply the very same *universal* gravity equation, where bilateral trade between any two countries depend on source prices, bilateral trade iceberg costs, and a measure of economic activity at the destination country. Based on this motivation, a simple product-level trade model *à la* Armington (1969) is introduced of which implications are used for decomposing the changes in global trade into those due to supply-side factors (capturing source prices and thus production or exporting costs in source countries), demand-side factors (capturing economic activity or preferences in destination countries), and bilateral trade costs (capturing bilateral protectionism measures).

The knowledge of the decomposition of changes in global trade is important especially countries focusing on export-led growth (e.g., see Adelman (1984), Henriques and Sadorsky

[1]The statistics given here are based on Table 1 of this paper.

(1996) or Giles and Williams (2000)), because if supply-side factors are effective in explaining changes in global trade, source countries may want to invest more into their production technologies, infrastructure, financial depth, operational costs of exporting, costs related to entering foreign markets, or modifying their products for individual foreign markets. In contrast, if demand-side factors are effective, source countries may want to invest in removing information barriers (e.g., through advertising their products) to affect preferences of destination countries. Finally, if bilateral trade costs are effective, source countries may want to get involved in negotiations to reduce trade barriers (e.g., through free trade agreements).

Regarding the methodology that follows Yilmazkuday (2021), the decomposition of changes in global trade is achieved first by estimating the *log-linear* product-level bilateral trade implications of a trade model and second by aggregating the fitted estimation results across bilateral countries using Taylor series to obtain global measures in *levels* for each product. This methodology results in identifying the contribution of supply-side factors, demand-side factors and bilateral trade costs to changes in product-level global trade between 1995 and 2018. The corresponding results suggest that supply-side effects have contributed to changes in global trade by about 85%, followed by demand-side effects with a contribution of about 13% and by bilateral trade costs with a contribution of about 8%. The corresponding contribution of residuals by only about -6% capturing unexplained part of the data by the model implications or approximation due to using Taylor series further supports the investigation.

Across products, supply-side effects explain cumulative changes in product-level global trade between 47% (for Textiles) and 97% (for Chemicals & Allied Industries). In comparison, demand-side effects explain cumulative changes in product-level global trade between 3% (for Stone/Glass) and 45% (for Animal & Animal Products). Finally, bilateral trade costs contribute to product-level global trade between 3% (for Chemicals & Allied Industries or Wood & Wood Products) and 24% (for Textiles). Across broad economic categories, supply-side factors contribute to global trade between 62% (for consumption goods) and 89% (for intermediate goods), demand-side factors contribute to global trade between 8% (for intermediate goods) and 29% (for consumption goods), and bilateral trade costs contribute to global trade between 7% (for intermediate goods) and 13% (for consumption goods).

As supply-side factors are shown to be the main drivers of global trade, it is implied that rather than purely focusing on reducing bilateral trade costs through trade negotiations, one additional way for source countries to increase their exports is to reduce their production costs, say, by investing more into technology, infrastructure, or financial depth, while another way is to reduce their export-related costs such as operational costs of exporting, costs related to entering foreign markets or modifying their products for individual foreign markets, all consistent with an export-led growth.

With respect to the existing literature, this paper is closest to the study by Yilmazkuday (2021) who has also used Taylor series to convert estimated *percentage* changes in trade (represented as log differences over time) into changes in the *level* of trade. Yilmazkuday (2021) has focused on trade deficits at the country level by using aggregate-level trade data. However, as suggested in studies such as by Anderson and Van Wincoop (2004), Anderson (2009), Anderson and Yotov (2010), Raimondi and Olper (2011) and Anderson and Yotov (2016), using aggregate-level data can result in an aggregation bias in the estimation of trade costs. Accordingly, studies such as by Bektasoglu, Engelbert, and Brockmeier (2017) suggest to disaggregate the data to be used in gravity estimations as much as possible to reduce the aggregation bias. Following these studies, this paper deviates from Yilmazkuday (2021) by achieving such a disaggregated-level investigation through using six-digit product level trade data. Once the estimation is achieved at the six-digit product level, the fitted estimation results are aggregated across bilateral countries using Taylor series to obtain *global* measures in *levels* for each product, which is the key innovation in this paper. Moreover, as

Yilmazkuday (2021) focuses on trade deficits at the country level, the corresponding results have policy suggestions to reduce country-specific trade deficits. As this paper aggregates the six-digit product-level results across countries to obtain implications for global trade at the product level, we also deviate from Yilmazkuday (2021) due to having product-level policy suggestions for source countries focusing on an export-led growth.

The rest of the paper is organized as follows. The next section provides a theoretical motivation for the empirical investigation. Section 3 introduces the estimation methodology and the data used. Section 4 discusses the drivers of global trade at the product level. Section 5 concludes.

2 Model

In the literature, studies such as by Allen, Arkolakis, and Takahashi (2020) have shown that several international trade models such as by Armington (1969), Anderson (1979), Anderson and Van Wincoop (2003), Eaton and Kortum (2002), Dekle, Eaton, and Kortum (2008), Caliendo and Parro (2015), Krugman (1980), Melitz (2003), Arkolakis, Demidova, Klenow, and Rodriguez-Clare (2008), di Giovanni and Levchenko (2009), and Bernard, Eaton, Jensen, and Kortum (2003) imply the very same *universal* gravity equation, where bilateral trade between any two countries depend on source prices, bilateral trade iceberg costs, and a measure of economic activity at the destination country. Accordingly, for motivational purposes, we follow this literature by utilizing a product-level trade model *à la* Armington (1969), although the implications provided below would be the same if alternative models mentioned above would be employed.

Although only the details of the consumer side are considered below through functions satisfying constant elasticity of substitution (CES), the very same implications for trade can easily be shown to hold for intermediate inputs or capital goods when the corresponding demand functions satisfy CES on the production side (that is skipped to save space).

2.1 Economic Environment

The utility of a representative individual in country n at time t is given by the following function:

$$C_{nt} = \left(\sum_{s} (\alpha_{snt})^{\frac{1}{\eta}} (C_{snt})^{\frac{\eta-1}{\eta}} \right)^{\frac{\eta}{\eta-1}} \tag{1}$$

where C_{snt} represents consumption of product s, η is the elasticity of substitution across products, and α_{snt} represents preferences toward such products. In this expression, C_{snt} is further given by:

$$C_{snt} = \left(\sum_{i} (\beta_{snt})^{\frac{1}{\theta}} (C_{snit})^{\frac{\theta-1}{\theta}} \right)^{\frac{\theta}{\theta-1}} \tag{2}$$

where C_{snit} represents product$-s$ imports of country n from country i at time t, θ is the elasticity of substitution across source countries, and β_{snt} represents preferences. The optimization of Equation 1 results in the following value of imports from country i:

$$P_{snt} C_{snt} = \alpha_{snt} \left(\frac{P_{snt}}{P_{nt}} \right)^{1-\eta} P_{nt} C_{nt} \tag{3}$$

where P_{snt} is the price of C_{snt}, and P_{nt} is the price of C_{nt} given by:

$$P_{nt} = \left(\sum_{s} \alpha_{snt} (P_{snt})^{1-\eta} \right)^{\frac{1}{1-\eta}} \tag{4}$$

Similarly, the optimization of Equation 2 results in the following value of imports from country i:

$$P_{snit} C_{snit} = \beta_{snt} \left(\frac{P_{snit}}{P_{snt}} \right)^{1-\theta} P_{snt} C_{snt} \tag{5}$$

where P_{snit} is the price of C_{snit} that satisfies:

$$P_{snt} = \left(\sum_i \beta_{snt} \left(P_{snit} \right)^{1-\theta} \right)^{\frac{1}{1-\theta}} \tag{6}$$

Since imports of country n from country i are subject to trade costs $\tau_{snit} > 1$ at time t, P_{snit} also satisfies:

$$P_{snit} = P_{siit} \tau_{snit} \tag{7}$$

where P_{siit} is the price of C_{snit} measured at the source country i at time t, and trade costs τ_{snit} is further given by:

$$\tau_{snit} = \tau_{nit} \tau_{sni} \tag{8}$$

where τ_{nit} represents trade costs that are source-country, destination-country and time specific (that are common across products), and τ_{sni} represents trade costs that are source-country, destination-country and product specific (that are constant over time).

Combining Equations 3, 5, 7 and 8, together with taking log of both sides, results in the following expression for the value of product$-s$ imports of country n from country i at time t:

$$\begin{aligned}
\underbrace{\log \left(P_{snit} C_{snit} \right)}_{\text{Value of Imports}} &= \underbrace{\log \left(\alpha_{snt} \beta_{snt} \right) + (\theta - \eta) \log \left(P_{snt} \right) + \log \left(\left(P_{nt} \right)^{\eta} C_{nt} \right)}_{\text{Destination-Product-Time Specific Factors}} \\
&+ \underbrace{(1-\theta) \log \left(P_{siit} \right)}_{\text{Source-Product-Time Specific Factors}} + \underbrace{(1-\theta) \log \left(\tau_{sni} \right)}_{\text{Destination-Source-Product Specific Factors}} \\
&+ \underbrace{(1-\theta) \log \left(\tau_{nit} \right)}_{\text{Destination-Source-Time Specific Factors}}
\end{aligned} \tag{9}$$

which is an expression that can be estimated to identify destination-product-time specific factors, source-product-time specific factors, destination-source-product specific factors and destination-source-time specific factors.

2.2 Implications for Product-Level Global Trade over Time

Percentage changes in the value of product$-s$ imports of country n from country i at time t can be measured by taking the difference of Equation 9 over time as follows:

$$\underbrace{\Delta \log \left(P_{snit} C_{snit}\right)}_{\text{Value of Imports}} = \underbrace{\Delta \log \left(\alpha_{snt} \beta_{snt}\right) + (\theta - \eta) \Delta \log \left(P_{snt}\right) + \Delta \log \left(\left(P_{nt}\right)^{\eta} C_{nt}\right)}_{\text{Destination-Product-Time Specific Factors}} \tag{10}$$
$$+ \underbrace{(1 - \theta) \Delta \log \left(P_{siit}\right)}_{\text{Source-Product-Time Specific Factors}} + \underbrace{(1 - \theta) \Delta \log \left(\tau_{nit}\right)}_{\text{Destination-Source-Time Specific Factors}}$$

where Δ represents time difference, and destination-source-product specific factors have been eliminated as they are constant over time. By using Taylor series of $\Delta \log (x_t) = \frac{\Delta x_t}{(x_t + x_{t-1})/2} + o(\|f^2\|)$ for the left hand side of Equation 10 as in studies such as by Yilmazkuday (2021), where $o(\|f^2\|)$ represents terms that are equal to or higher than 2^{nd} order, Equation 10 can be rewritten as follows:

$$\underbrace{\frac{\Delta \left(P_{snit} C_{snit}\right)}{\widetilde{P_{snit} C_{snit}}}}_{\text{\% Change in Imports}} = \Delta \log \left(\alpha_{snt} \beta_{snt}\right) + (\theta - \eta) \Delta \log \left(P_{snt}\right) + \Delta \log \left(\left(P_{nt}\right)^{\eta} C_{nt}\right) \tag{11}$$
$$+ (1 - \theta) \Delta \log \left(P_{siit}\right) + (1 - \theta) \Delta \log \left(\tau_{nit}\right) + o\left(\left\| f_{snit}^2 \right\|\right)$$

where $\widetilde{P_{snit}C_{snit}} = (P_{snit}C_{snit} + P_{snit-1}C_{snit-1})/2$. Multiplying both sides of Equation 11 results in an expression, this time representing the change in the *level* of imports:

$$\underbrace{\Delta\left(P_{snit}C_{snit}\right)}_{\text{Change in Imports}} = \Delta\log\left(\alpha_{snt}\beta_{snt}\right)\widetilde{P_{snit}C_{snit}} + (\theta-\eta)\Delta\log\left(P_{snt}\right)\widetilde{P_{snit}C_{snit}} \tag{12}$$
$$+\Delta\log\left(\left(P_{nt}\right)^{\eta}C_{nt}\right)\widetilde{P_{snit}C_{snit}} + (1-\theta)\Delta\log\left(P_{siit}\right)\widetilde{P_{snit}C_{snit}}$$
$$+(1-\theta)\Delta\log\left(\tau_{nit}\right)\widetilde{P_{snit}C_{snit}} + o\left(\left\|f_{snit}^{2}\right\|\right)\widetilde{P_{snit}C_{snit}}$$

Finally, taking the sum of both sides across destination countries and source countries results in the following expression representing the changes in product-level global trade over time:

$$\underbrace{\sum_{n,i}\Delta\left(P_{snit}C_{snit}\right)}_{\text{Changes in Product-Level Global Trade}} = \underbrace{\sum_{n,i}\begin{pmatrix}\Delta\log\left(\alpha_{snt}\beta_{snt}\right)\\ +(\theta-\eta)\Delta\log\left(P_{snt}\right)\\ +\Delta\log\left(\left(P_{nt}\right)^{\eta}C_{nt}\right)\end{pmatrix}\widetilde{P_{snit}C_{snit}}}_{\text{Changes due to Demand-Side Developments}} \tag{13}$$
$$+\underbrace{\sum_{n,i}\left(\left(1-\theta\right)\Delta\log\left(P_{siit}\right)\right)\widetilde{P_{snit}C_{snit}}}_{\text{Changes due to Supply-Side Developments}}$$
$$+\underbrace{\sum_{n,i}\left(\left(1-\theta\right)\Delta\log\left(\tau_{nit}\right)\right)\widetilde{P_{snit}C_{snit}}}_{\text{Changes due to Developments in Bilateral Trade Costs}}$$
$$+\underbrace{\sum_{n,i}\left(o\left(\left\|f_{snit}^{2}\right\|\right)\right)\widetilde{P_{snit}C_{snit}}}_{\text{Changes due to using Taylor series}}$$

In this expression, when all right hand side variables are identified, changes in product-level global trade can be decomposed into those due to demand-side developments, those due to supply-side developments, and those due to developments in bilateral trade costs. Accordingly, given data for product-level bilateral imports $P_{snit}C_{snit}$, this decomposition can be achieved by identifying destination-product-time specific factors, source-product-time specific factors, destination-source-product specific factors and destination-source-time specific factors are identified according to Equation 9. We achieve the identification of these factors by estimating Equation 9 as we detail in the next section.

Once right hand side variables are identified in Equation 13 and thus product-level global trade is decomposed into those due to alternative factors, aggregations across products can also be achieved to have summary results, as we will achieve during the empirical results section, below.

3 Estimation Methodology and Data

Given data for product-level bilateral imports of country n from country i, $P_{snit}C_{snit}$, the identification of right hand side variables in Equation 13 is achieved by estimating the stochastic version of Equation 9 as follows:

$$\begin{aligned}\underbrace{\log\left(P_{snit}C_{snit}\right)}_{\text{Value of Imports}} &= \underbrace{\log\left(\alpha_{snt}\beta_{snt}\right)+\left(\theta-\eta\right)\log\left(P_{snt}\right)+\log\left(\left(P_{nt}\right)^{\eta}C_{nt}\right)}_{\text{Destination-Product-Time Fixed Effects}} \\ &+ \underbrace{\left(1-\theta\right)\log\left(P_{siit}\right)}_{\text{Source-Product-Time Fixed Effects}} + \underbrace{\left(1-\theta\right)\log\left(\tau_{sni}\right)}_{\text{Destination-Source-Product Fixed Effects}} \\ &+ \underbrace{\left(1-\theta\right)\log\left(\tau_{nit}\right)}_{\text{Destination-Source-Time Fixed Effects}} + \underbrace{\log\left(\varepsilon_{snit}\right)}_{\text{Residuals}}\end{aligned} \tag{14}$$

where destination-product-time fixed effects, source-product-time fixed effects, destination-source-product fixed effects and destination-source-time fixed effects are employed. The changes (over time) in fitted values of these fixed effects, together with data on $\widetilde{P_{snit}C_{snit}}$, are used to identify right hand side variables in Equation 13, whereas estimated residuals are combined with the last term on the right hand side of Equation 13 to measure the unexplained part of the data by the implications of the trade model or due to using Taylor series (called as "Residuals" during the empirical-results section, below).

The estimation is achieved by using the Poisson Pseudo-Maximum Likelihood (PPML) regression to have an unbiased and consistent estimator as suggested in studies such as by Silva and Tenreyro (2006) and Fally (2015). Data on the annual value of product-level bilateral imports of country n from country i, $P_{snit}C_{snit}$, are obtained from BACI trade data set of CEPII (Centre d'Etudes Prospectives et d'informations Internationales). We employ the six-digit product level version of this data set for the years between 1995 and 2018 that is based on the 1992 harmonized system (HS) for the categorization of products. In total, the data set used in the estimation of Equation 14 covers $5,018$ six-digit HS products and up to 225 countries over the sample period.

4 Empirical Results

Although the estimation of Equation 14 is achieved by using data for $5,018$ six-digit HS products for the years between 1995 and 2018, in this section, we represent the implications of this estimation on Equation 13 based on a certain aggregation of these products for presentational purposes and to save space. In particular, we consider empirical results based on one-digit HS products and broad economic categories in this section, although empirical results based on two-digit HS products are available upon request for interested readers. Since the left hand side of Equation 13 represents the *changes* in product-level global trade, the decomposition of *cumulative* changes of product-level global trade over time can be achieved starting from the year of 1995.

4.1 Results Based on One-Digit HS Products

When the aggregation across products is achieved to have the decomposition of global trade at the one-digit HS product level, the cumulative changes over time are given in Figures 1-5. These figures decompose *cumulative* changes in one-digit HS product-level global trade into changes due to demand-side effects, changes due to supply-side effects, changes due to developments in bilateral trade costs, and residuals according to Equation 13.

As is evident, supply-side effects are dominant in explaining cumulative changes in product-level global trade for all one-digit HS products, followed by demand-side effects and effects of bilateral trade costs. The corresponding cumulative changes as of 2018 are represented in Table 1, where it is shown that supply-side effects explain cumulative changes in one-digit HS product global trade between 47% (for Textiles) and 97% (for Chemicals & Allied Industries). In comparison, demand-side effects explain cumulative changes in one-digit HS product global trade between 3% (for Stone/Glass) and 45% (for Animal & Animal Products). Finally, bilateral trade costs contribute to one-digit HS product global trade between 3% (for Chemicals & Allied Industries or Wood & Wood Products) and 24% (for Textiles).

It is important to emphasize that supply-side effects in this decomposition may be representing source-specific trade costs (e.g., having higher export costs in developing countries as documented by Waugh (2010)) as demand-side effects may be representing destination-specific trade costs (e.g., having higher local costs of distribution in destination countries as documented by Giri (2012)). Accordingly, having a higher contribution of supply-side effects on product-level global trade may be either due to lower costs of production or due to lower costs of exporting in the source country.

Nevertheless, independent of what these supply-side effects represent, they are those determined by the source country as demand-side effects are determined by the destination country. In contrast, bilateral trade costs mostly depend on trade negotiations, and their contribution is relatively minor, especially compared to supply-side effects. It is implied that supply-side effects capturing production costs or export costs in the source country are the main drivers of global trade, independent of the one-digit HS product considered.

4.2 Results Based on Broad Economic Categories

As discussed above, although the estimated Equation 14 to identify the factors in Equation 13 is implied by a consumer-side model based on CES functions, the very same implications for trade can easily be shown to hold for intermediate inputs or capital goods when the corresponding demand functions satisfy CES on the production side. Based on this justification and the categorization of six-digit HS products depending on broad economic categories, the corresponding decomposition of global trade over time is achieved in Figure 6.

As is evident, although supply-side effects still dominate other factors, demand-side factors also contribute to the global trade of consumption (final) goods, followed by only minor contributions of bilateral trade costs. In contrast, global trade of intermediate inputs or capital goods are almost completely explained by supply-side factors. Regarding the corresponding magnitudes given in Table 1, supply-side factors contribute to global trade between 62% (for consumption goods) and 89% (for intermediate goods), demand-side factors contribute to global trade between 8% (for intermediate goods) and 29% (for consumption goods), and bilateral trade costs contribute to global trade between 7% (for intermediate goods) and 13% (for consumption goods).

It is one more time implied that supply-side effects capturing production costs or export costs in the source country are the main drivers of global trade, independent of the one-digit HS product considered. Nevertheless, demand-side effects, including preferences of individuals, also partly contribute to the global trade of consumption goods.

4.3 Implications for Global Trade

When all six-digit HS products are aggregated, the corresponding decomposition of global trade over time is achieved in Figure 7. Consistent with earlier figures, supply-side effects contribute the most to global trade, followed by demand-side effects and bilateral trade costs. Regarding the corresponding magnitudes given in Table 1, supply-side factors contribute to changes in global trade by about 85%, followed by demand-side factors with a contribution of about 13% and by bilateral trade costs with a contribution of about 8%. Finally, contribution of residuals either through estimated residuals in Equation 14 or through $o\left(\|f^2\|\right)$ due to using Taylor series of $\Delta \log(x_t) = \frac{\Delta x_t}{(x_t + x_{t-1})/2} + o\left(\|f^2\|\right)$ is about -6%, supporting the overall decomposition achieved in this paper.

As supply-side effects contribute the most to global trade, it is implied that source countries may want to invest more into their production technologies, infrastructure, financial depth, operational costs of exporting, costs related to entering foreign markets, or modifying their products for individual foreign markets. This is consistent with an export-led growth as discussed in studies such as by Adelman (1984), Henriques and Sadorsky (1996) or Giles and Williams (2000).

5 Conclusion

This paper has explored the product-level drivers of global trade that are consistent with the implications of a large class of trade models. The empirical investigation has been based on estimating a bilateral trade regression using data on six-digit HS products covering up to 225 countries between 1995 and 2018. Using Taylor series, the estimated fitted values of this regression have been further used to decompose product-level global trade into factors representing demand-side effects, supply-side effects and effects through bilateral trade costs.

The empirical results suggest that supply-side effects have contributed to changes in global trade the most, followed by demand-side effects and bilateral trade costs. It is important to emphasize that supply-side effects in the decomposition achieved this paper may be representing source-specific trade costs (as in Waugh (2010)), whereas demand-side effects may be representing destination-specific trade costs (as in Giri (2012)). Accordingly, having a higher contribution of supply-side effects on product-level global trade may be either due to lower costs of production or due to lower costs of exporting in the source country.

It is implied that supply-side effects capturing production costs or export costs in the source country are the main drivers of global trade, supporting the concept of an export-led growth. Therefore, rather than purely focusing on reducing bilateral trade costs through trade negotiations, one alternative way for countries to increase their exports is to reduce their production costs, say, by investing more into technology, while another alternative way is to reduce their export-related costs such as operational costs of exporting, costs related to entering foreign markets or modifying their products for individual foreign markets.

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Table 1 - Decomposition of Changes in Global Product-Level Trade

		Percentage Contribution of:			
	Global Trade (Millions)	Supply-Side	Demand-Side	Bilateral Trade Costs	Residuals
All Products	6,183,854	85%	13%	8%	-6%
Broad Economic Categories:					
Consumption Goods	831,386	62%	29%	13%	-4%
Intermediate Goods	3,440,710	89%	8%	7%	-5%
Capital Goods	953,819	82%	16%	9%	-7%
Harmonized System 1-Digit Products:					
Animal & Animal Products	92,404	50%	45%	8%	-2%
Vegetable Products	165,688	86%	13%	6%	-6%
Foodstuffs	176,878	73%	24%	7%	-4%
Mineral Products	1,118,754	91%	5%	8%	-5%
Chemicals & Allied Industries	649,584	97%	6%	3%	-6%
Plastics / Rubbers	283,571	83%	14%	4%	-2%
Raw Hides, Skins, Leather, & Furs	29,851	65%	30%	12%	-7%
Wood & Wood Products	95,452	65%	36%	3%	-4%
Textiles	206,093	47%	35%	24%	-6%
Footwear / Headgear	47,066	49%	33%	20%	-3%
Stone / Glass	218,627	94%	3%	12%	-9%
Metals	443,038	83%	14%	6%	-3%
Machinery / Electrical	1,608,460	89%	11%	9%	-9%
Transportation	661,099	78%	21%	7%	-6%
Miscellaneous	387,288	84%	14%	7%	-6%

Notes: The values represent the cumulative changes between 1995 and 2018. The values for all years can be found in figures.

Figure 1 - Global Product-Level Trade #1

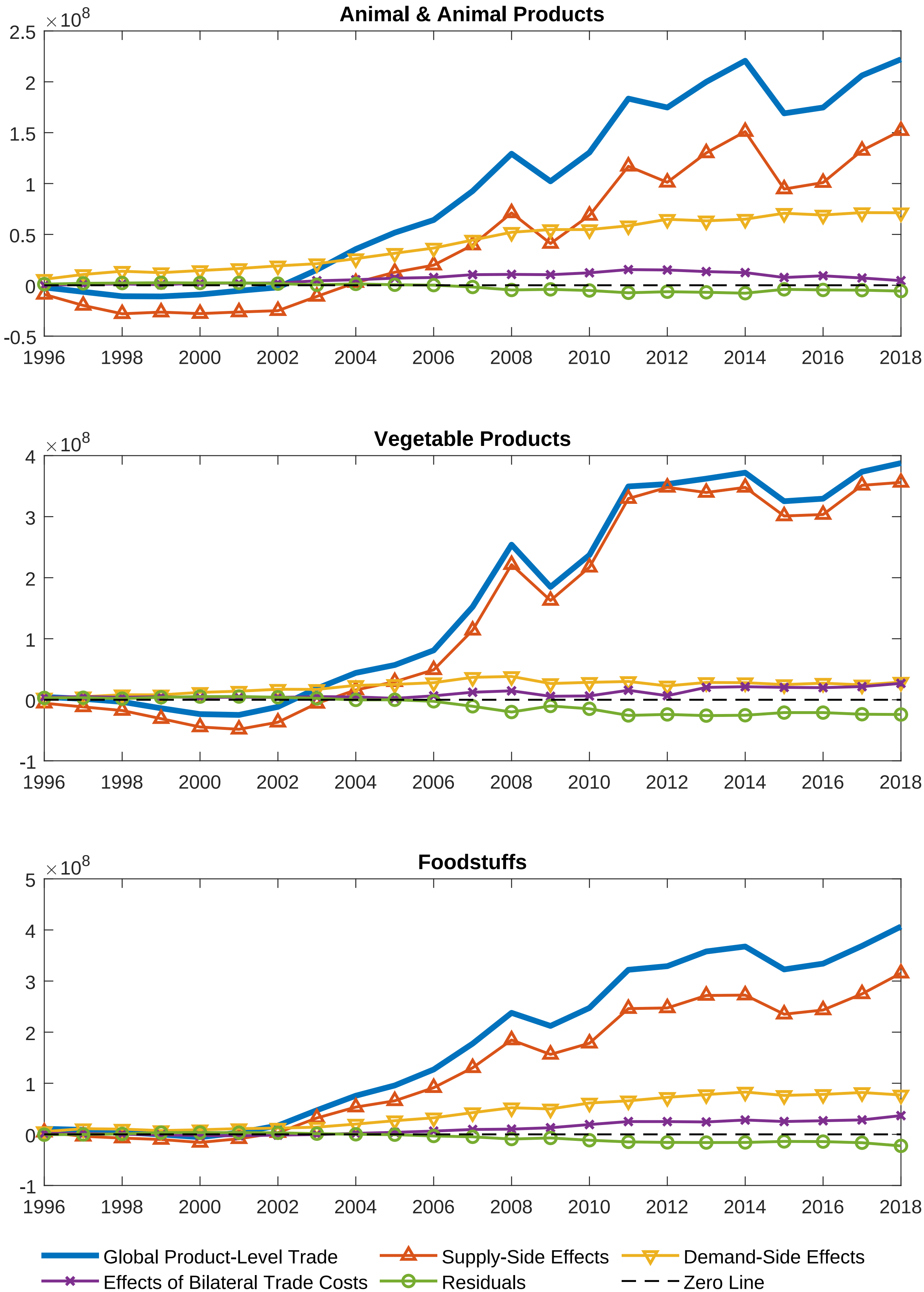


Figure 2 - Global Product-Level Trade #2

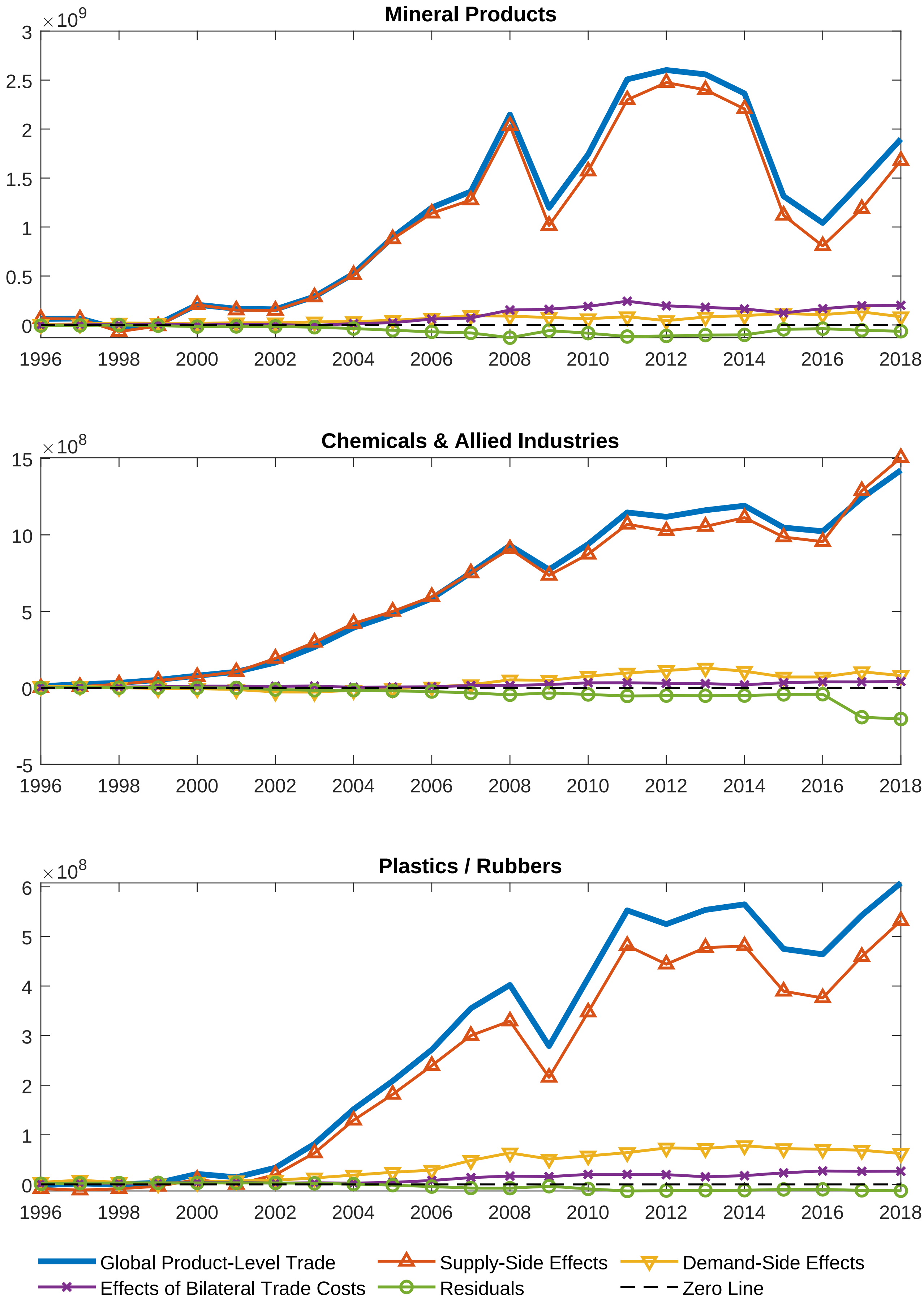


Figure 3 - Global Product-Level Trade #3

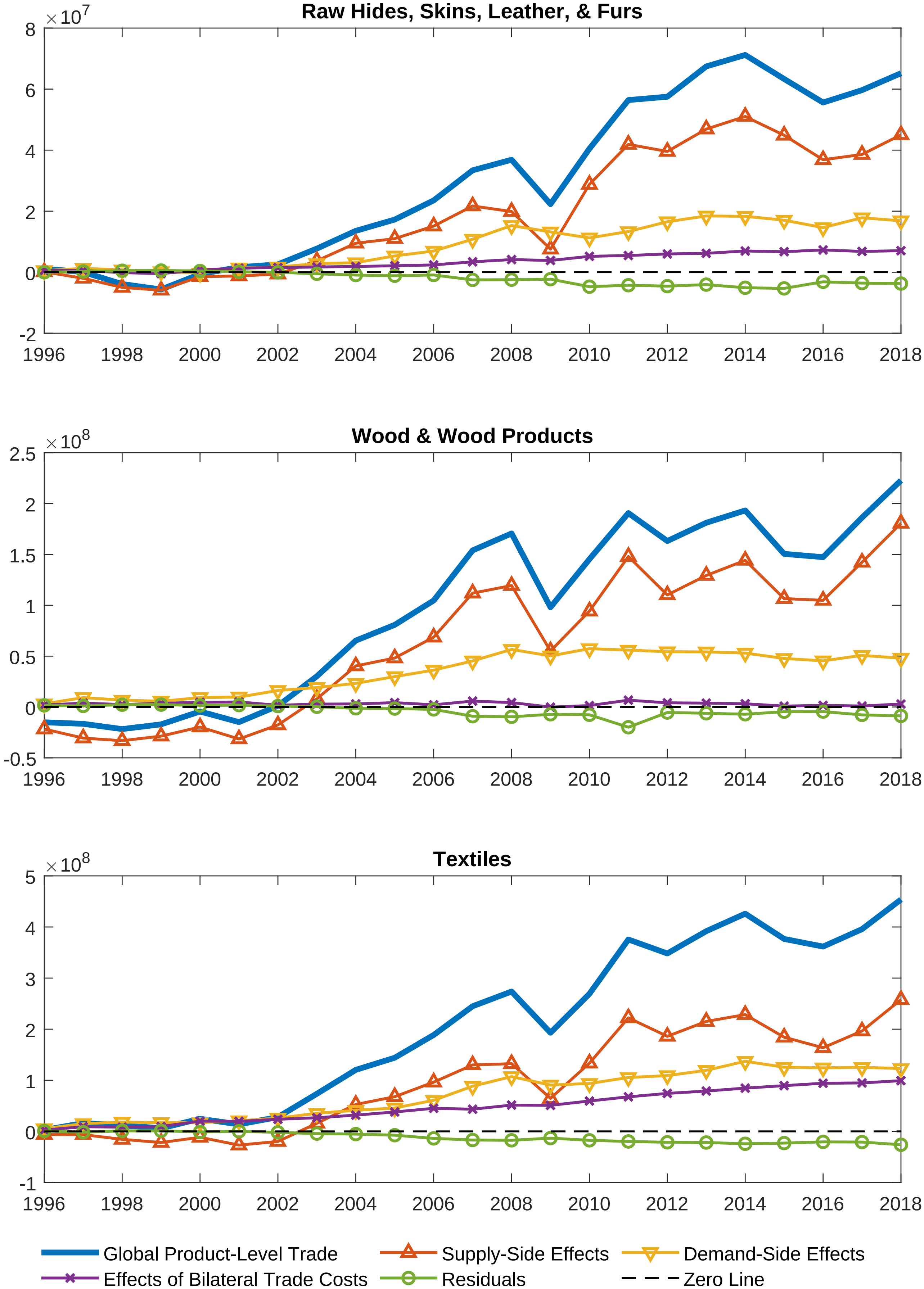


Figure 4 - Global Product-Level Trade #4

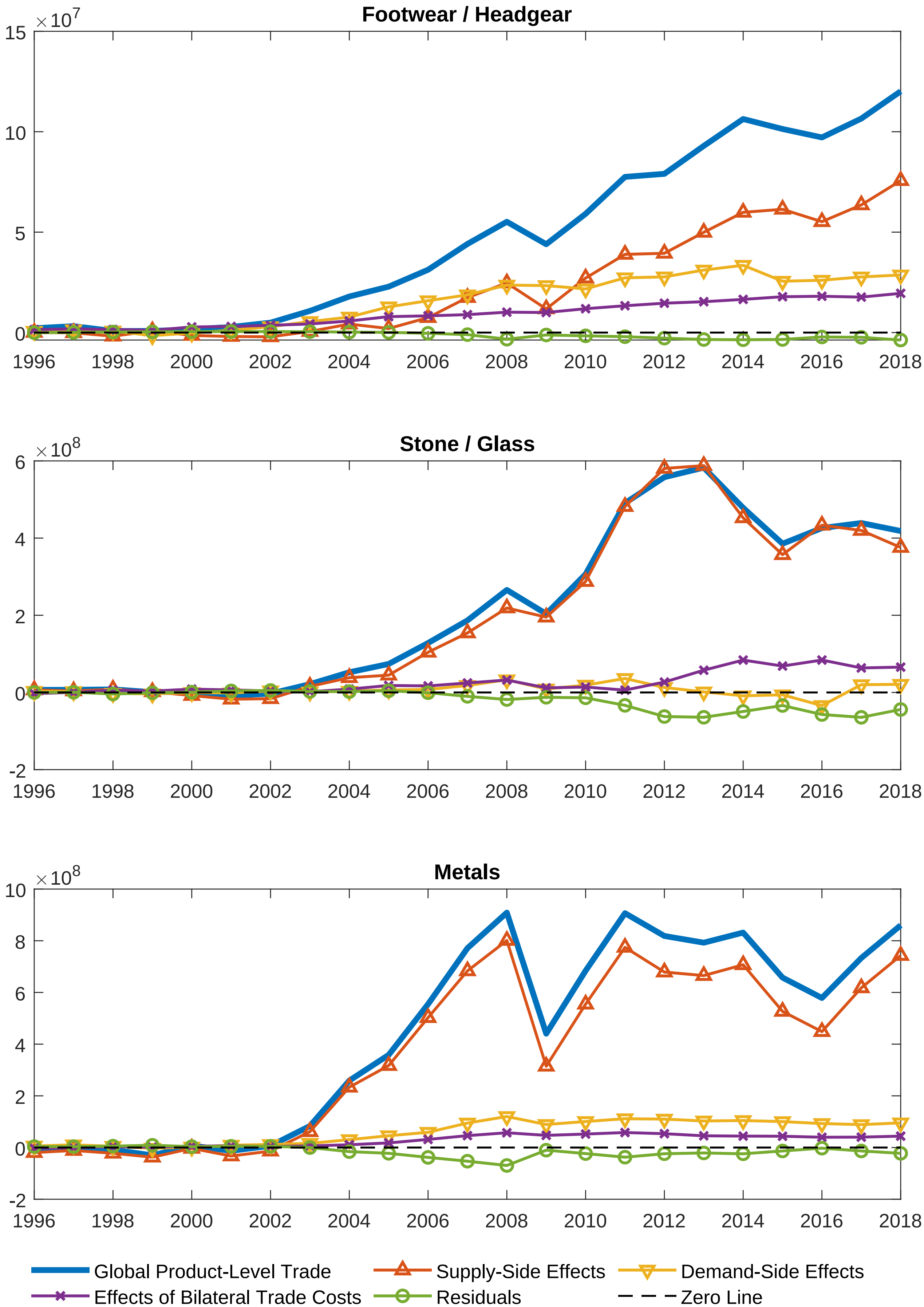


Figure 5 - Global Product-Level Trade #5

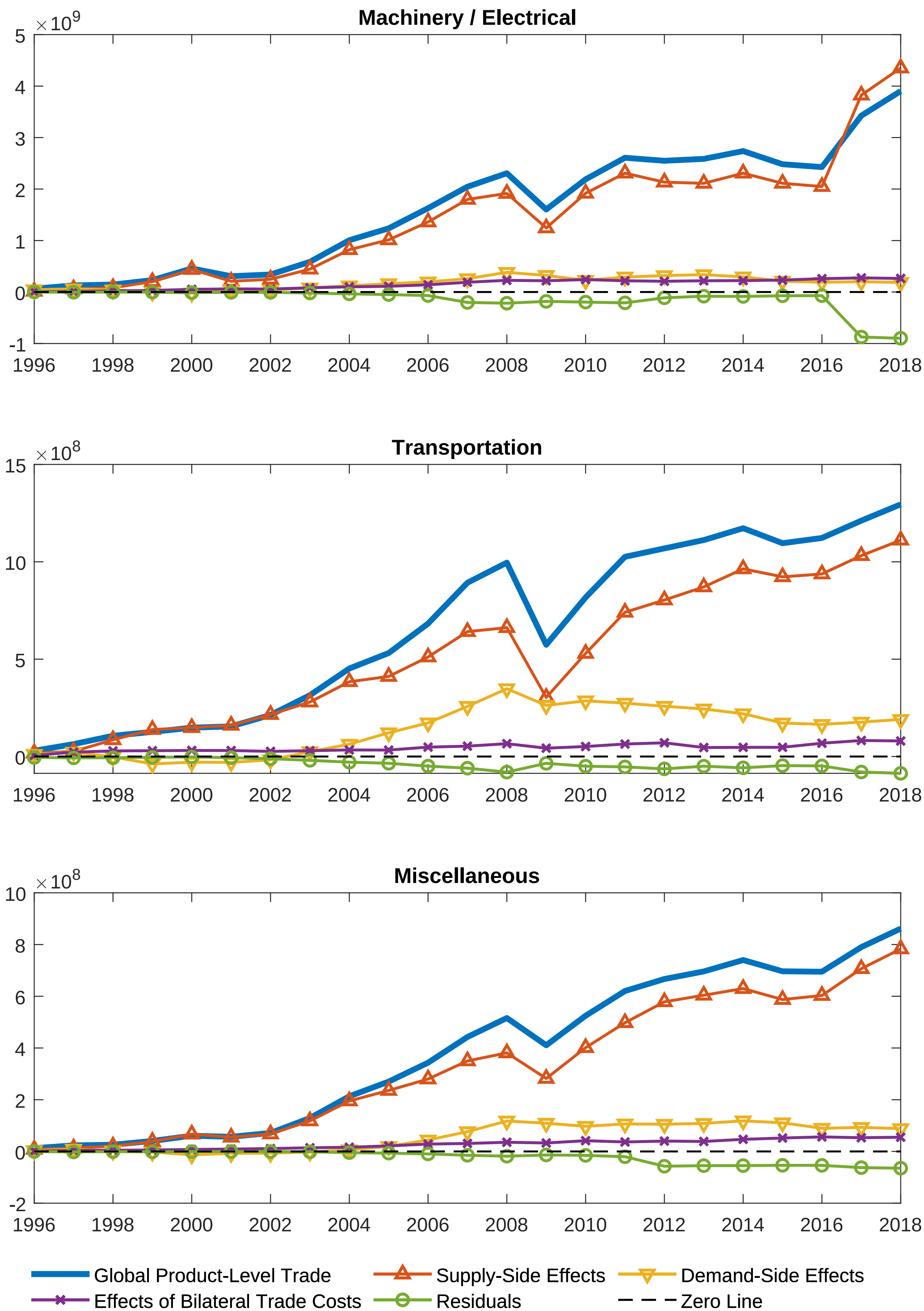
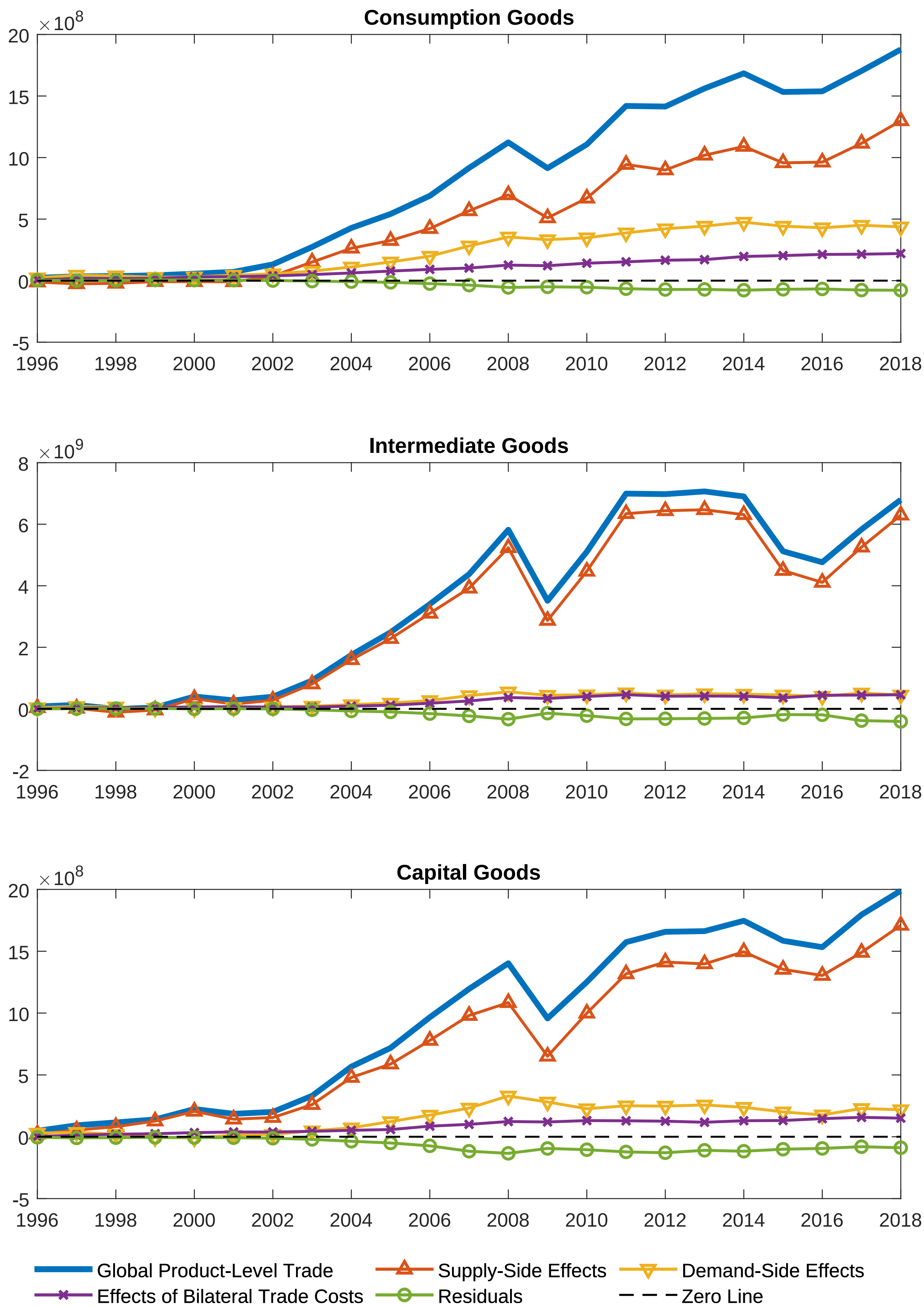


Figure 6 - Global Product-Level Trade #6



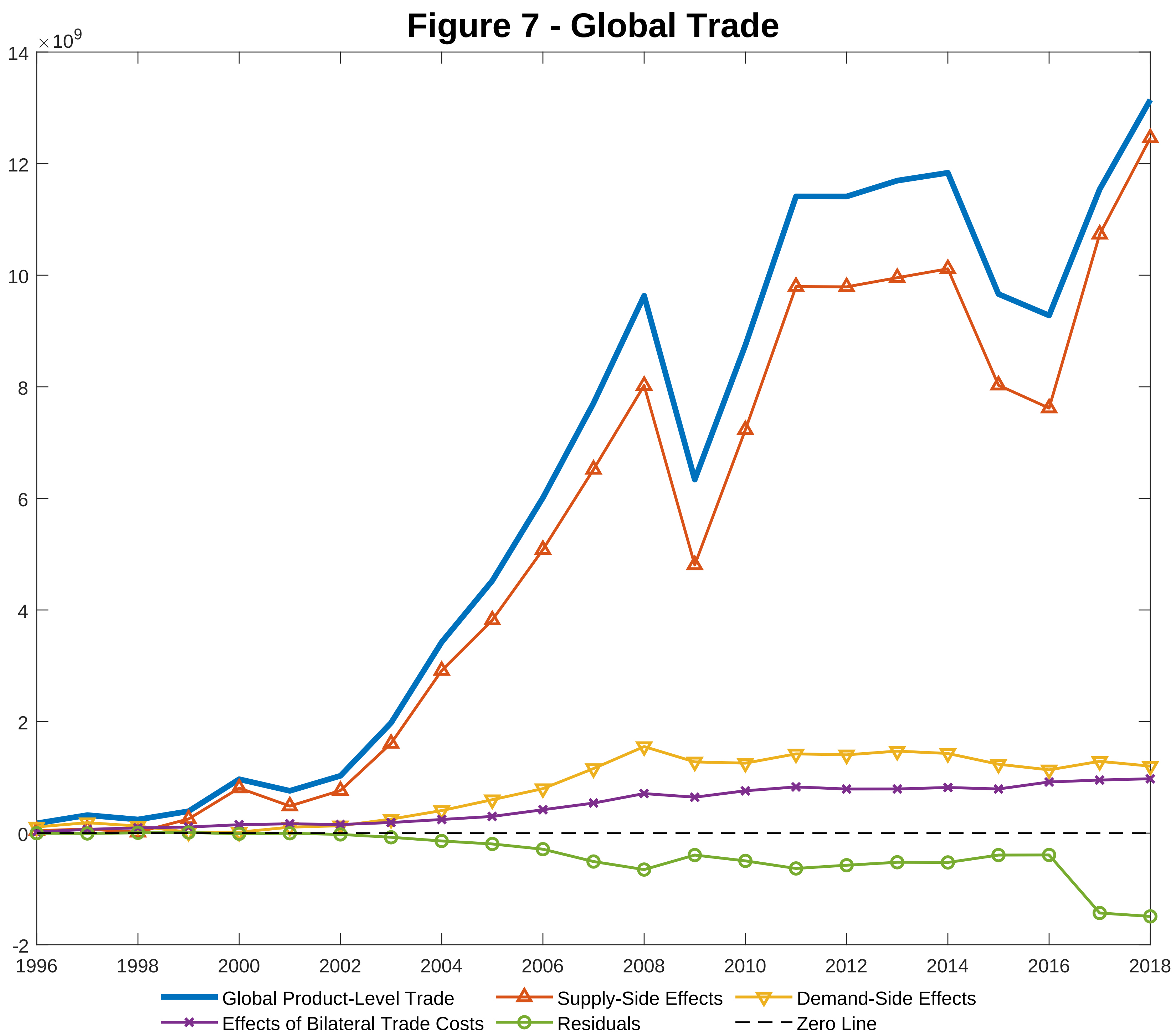


Figure 7 - Global Trade
×10^9
14
12
10
8
6
4
2
0
-2
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Global Product-Level Trade
Supply-Side Effects
Demand-Side Effects
Effects of Bilateral Trade Costs
Residuals
Zero Line