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Abstract

This paper attempts to quantify the impact of economic policy uncertainty on overall trade and trade linked to global value chains. Using new data on policy uncertainty for 18 countries and 24 years, it finds a statistically significant negative impact of policy uncertainty on overall trade growth. A 1 percent increase in uncertainty is associated with a 0.02 percentage point reduction in the growth of goods and services trade, implying that the increase in policy uncertainty since mid-2018 may have caused a 1 percentage point decline in world trade growth. The paper also finds that the impact of policy uncertainty on trade linked to global value chains is similar to overall trade. This is likely to be the result of two opposing forces: global value chains are more dependent on relation-specific investments that are sensitive to policy uncertainty, but these investments also make trade patterns sticky. More research and better data are needed to disentangle these different effects empirically.

Keywords

Economic Policy Uncertainty; Trade Growth; Global Value Chains.

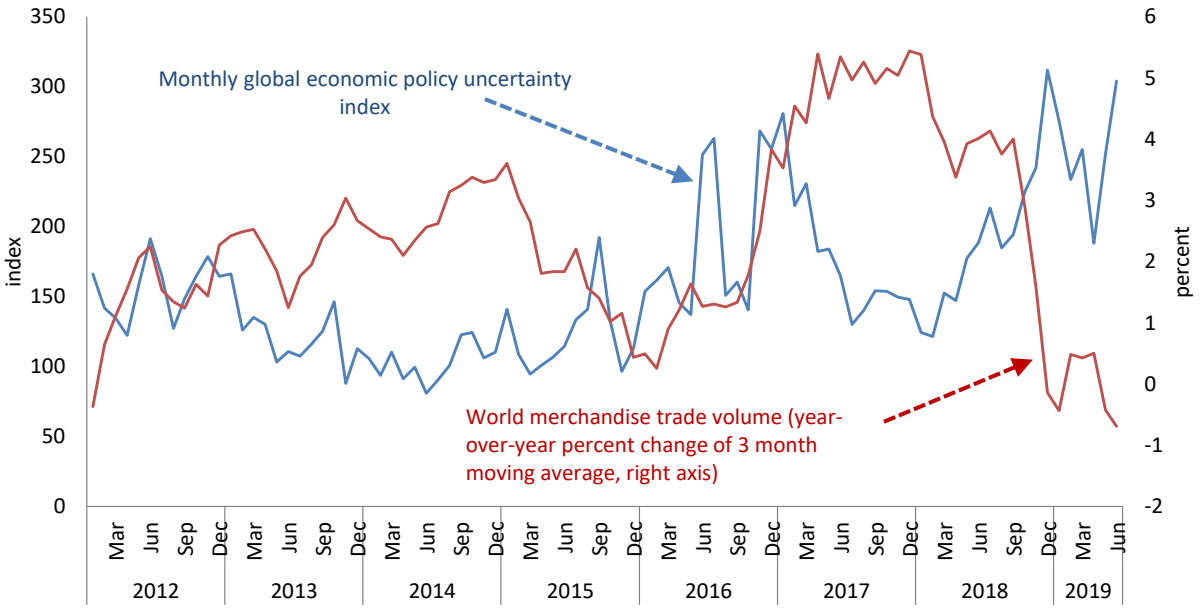
JEL codes: F13; F14.

1. Introduction*

Global trade has grown slowly after the Great Recession, and 2019 is projected to continue the trend as one of the years with the weakest trade performance since the 2008-2009 global financial crisis. A growing body of work analyzes the determinants of the current slowdown in global trade (Constantinescu et al. 2018; Hoekman 2015; Haugh et al. 2016; IMF 2016). Recent analyses attribute the trade slowdown, in varying degrees, to such factors as changes in the composition of economic activity away from import-intensive investment, a slowing pace of global value chain growth and trade liberalization, and an increase in trade protectionism.

This paper draws upon recent pioneering work on the measurement and impact of economic policy uncertainty (Baker et al. 2016) to examine whether policy uncertainty can help explain the slowdown in world trade growth. To motivate the analysis, Figure 1 juxtaposes the growth in volume of world merchandise imports against an index of global economic policy uncertainty. The figure does suggest that there is a negative association between the two, and the particularly weak trade performance in 2019 has coincided with unusually high levels of economic policy uncertainty in that year.

Figure 1. World import growth and policy uncertainty, January 2012 to June 2019



Source: CPB Netherlands Bureau of Economic Policy Analysis, www.PolicyUncertainty.com, Baker et al. (2016), and authors' calculations.

Economic policy uncertainty may lower trade growth in two ways. First, a rise in policy uncertainty reduces trade indirectly by reducing GDP growth. In a less-certain environment, firms may choose to postpone investment decisions, consumers may cut back spending, and banks may increase the cost of finance. Second, policy uncertainty, may affect trade directly, by affecting firms' decisions to invest to serve foreign markets or to source inputs internationally.

* We would like to thank Bernard Hoekman for detailed comments on an earlier draft of this paper. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

An important question is whether economic policy uncertainty affects global value chain (GVC) related trade more than other trade. There are contrasting effects which play out over time because GVC trade requires larger upfront relation-specific sunk investments and is concentrated in capital intensive sectors. These investments make GVC trade flows stickier and less responsive to any change in the environment, including economic policy uncertainty. However, since economic policy uncertainty affects investment choices, it should eventually have larger effects on GVC trade compared to other trade. These effects are confounded by the fact that consumer and producer investment goods are typically produced through longer GVCs. Trade in these investment goods is likely to be more sensitive to demand for investment which is affected by policy uncertainty. The combination of these forces determines whether economic policy uncertainty affects GVC trade differently from other trade.

We conduct a panel estimation covering 18 countries over 24 years. Our results, which are robust across a wide range of specifications, suggest a statistically significant negative impact of policy uncertainty on trade growth. A 1 percent increase in uncertainty is associated with a 0.02–percentage point reduction in goods and services trade volume growth. For example, based on these estimates, the increase in economic policy uncertainty since mid-2018 may have caused a 1 percentage point decrease in world trade growth. The finding is robust to focusing on subcategories of trade and employing different specifications. GVC trade appears to be as sensitive to uncertainty as non GVC trade.

Looking at the impact on components of trade may help illuminate the economic channels through which policy uncertainty affects trade. We find that economic policy uncertainty negatively affects imports of capital goods, imports of non-durable consumer goods as well as imports used to produce exports. These findings are consistent with the view that economic policy uncertainty reduces trade growth by reducing foreign firms' incentives to invest in serving the market, by inducing consumers' precautionary saving and by affecting firms that are part of global value chains.

The implication of this result is that economic policy uncertainty has contributed to the sluggishness in world trade growth in recent years. However, its consequences for global value chains are less clear. We find that trade linked to GVCs responds to economic policy uncertainty in a way that it is broadly similar to overall trade. As discussed above, this could be the result of opposing forces linking uncertainty to GVC trade. In the long term, we would expect the negative forces to dominate as economic policy uncertainty would induce firms to withhold investments today that would promote GVC trade tomorrow.

We also look at trade policy uncertainty, which has been an important component of economic policy uncertainty in recent times. We rely on the work of Ahir et al. (2019) that builds on the EPU index methodology to include trade-related keywords and construct a world trade uncertainty (WTU) index. The index documents the large increase in trade policy uncertainty since 2017. But when we use the WTU index in our econometric analysis, we do not find a consistent negative effect of trade policy uncertainty on overall and GVC trade. Rather, this effect varies by country and is at times negative and at times positive.

This puzzling result depends on two main factors. First, the measure of trade policy uncertainty is based on the presence of the words "uncertainty" and "trade" in proximity within press articles. This approach does not allow us to distinguish between different types of uncertainty which could have different effects on trade. Specifically, whether the trade policy uncertainty is "negative", about the implementation of tariff increases, or "positive," as about the conclusion of a new trade liberalization agreement. Second, the measure fails to distinguish between whether the trade policy uncertainty measure for a specific country relates to its policies vis-à-vis all other countries or specific countries. Threats of escalating tariffs solely on trade between the US and China increase policy uncertainty worldwide. But its impact on US-China trade could be very different from the effect on trade between the US (or China) and third parties, which may benefit from uncertainty-induced trade diversion.

The rest of the paper is organized as follows. Section 2 reviews the existing literature on policy uncertainty. Section 3 presents the empirical strategy. Section 4 discusses the key results using the

economic policy uncertainty index, while the trade policy uncertainty index is used in Section 5. Concluding remarks follow.

2. Literature on policy uncertainty and trade

There is a large body of theoretical and empirical work that studies the impact of uncertainty, and of policy uncertainty, on growth and other macroeconomic variables. For example, Bernanke (1983) noted that high uncertainty can induce firms to delay investment and hiring when it is costly to undo investment projects or to hire and fire workers. Precautionary spending cuts by households and an increase in the cost of finance are also reasons why uncertainty has a dampening effect (Pastor and Veronesi, 2013).

Baker et al. (2016) provide a new measure of policy uncertainty based on newspaper coverage frequency and study the impact of this index on output, investment and employment. In a panel VAR setting for 12 large economies, they find that increases in policy uncertainty negatively affect these variables. In line with this finding, recent work at the World Bank documents the link between policy uncertainty and investment for emerging markets and developing economies (World Bank, 2017).

Hlatshwayo (2018) unpacks policy uncertainty by type of policy to distinguish generic, fiscal, monetary and trade policy uncertainty. Utilizing the latter index, Ebeke and Siminitz (2018) find an average decline of 0.8 percentage points in the investment-to-GDP ratio for five quarters following a one-standard-deviation increase in the level of trade uncertainty.

Ahir et al. (2018) develop a world uncertainty (WU) index that captures uncertainty related to economic and political developments in the short and long run. The WU index is compiled for a large set of developed and developing countries starting from 1996, by counting the occurrences of the word "uncertainty" in the quarterly Economist Intelligence Unit (EIU) country reports. Ahir et al. (2018) use this index to demonstrate that increases in uncertainty foreshadow significant output declines with uncertainty innovations explaining about 3 percent of variation in GDP growth after 8 quarters based on a VAR model.

Most recently, adapting the WU index methodology to include trade-related keywords, Ahir et al. (2019) construct a world trade uncertainty (WTU) index based on which they show that trade uncertainty explains more than 70 percent of the increase in uncertainty in the first quarter of 2019 and also that the increase in trade uncertainty observed in the first quarter of 2019 could be enough to reduce global growth by up to 0.75 percentage points in 2019.

A number of recent studies focus specifically on the relationship between trade policy uncertainty and trade (Handley, 2014; Handley and Limao, 2015 and 2017; and Crowley et al., 2018). They find that trade policy uncertainty has a negative impact on international trade flows through different channels. Handley (2014) and Handley and Limao (2015) find that trade policy uncertainty delays firms' entry into foreign markets. In particular, Handley and Limao (2015) structurally estimate the effect of policy uncertainty on firm entry following Portugal's accession to the European Community in 1986 and find that (i) the trade policy reform accounted for a large fraction of Portuguese exporting firms' entry and sales, (ii) the accession removed uncertainty about future EC trade policies, and (iii) this uncertainty channel accounted for a large fraction of the observed growth.

Handley and Limao (2017) have looked at China's accession to the WTO. This event was characterized by little or no change in the level of US import tariffs on goods from China, but involved a substantial reduction in uncertainty about what the US tariff rate on Chinese goods would be in the future. The study uses the elimination of pre-existing cross-sectional variation in tariff uncertainty that came with China's accession to identify the impact on trade flows. They find that this reduction in trade policy uncertainty can explain 22-30 percent of China's subsequent export growth to the US.

Crowley et al. (2018) provide the first empirical evidence that "tariff scares" – threats to raise tariffs in the future – have negative impacts on trade even when the threatened import tariff hikes never actually materialize. The analysis uses the universe of transaction-level Chinese customs data and focuses on the foreign market entry decisions of Chinese firms in response to antidumping duties imposed against China by 17 economies over 2000-2009. They study not how Chinese exports to a country fall when a country imposes a tariff, but rather how entry into new foreign markets by Chinese firms declines when other countries impose these special tariffs. They find that the average number of Chinese missing entrants because of tariff uncertainty per year is 1,718. The total number of missing entrants grew from 670 in 2001 to a peak of 2,920 in 2008.

Our paper complements this strand in the literature, because it examines the impact of economic policy uncertainty and trade policy uncertainty for a broad cross-section of major traders over a significant period of time, rather than for specific countries or specific episodes. Furthermore, previous work has not extended the analysis of economic policy uncertainty to encompass the recent trade slowdown.

3. Empirical strategy and data

To examine the effect of policy uncertainty on import growth, we start from a standard equation that links real import growth to growth in absorption and the change in relative prices, and which can be derived from any international real business cycle model (IMF 2016):

$$\Delta \ln M_{c,t} = \alpha + \beta * \Delta \ln D_{c,t} + \gamma * \Delta \ln P_{c,t} + \varepsilon_{c,t} \quad (1)$$

with Mct, Dct and Pct denoting, respectively, import volumes, real domestic income, and relative import prices of country c in year t.

We estimate the above using a panel model with country fixed effects (FE_c), while adding a measure of policy uncertainty to the list of explanatory variables. In addition, we introduce a set of year dummy variables (FE_t) - to absorb potential year-specific shocks affecting all countries- and we use real gross domestic product ($GDP_{c,t}$) and real effective exchange rate ($REER_{c,t}$) as proxies, respectively, for the real domestic income ($D_{c,t}$) and relative prices ($P_{c,t}$).

An important question is whether it is the level or the change in policy uncertainty that matters for trade growth. Purely on economic grounds, there is reason to consider each. The level of uncertainty, for instance, could be expected to affect the level of consumption, and hence the level of imports, so that import growth depends on the change in uncertainty. But investment by firms is sensitive to the level of uncertainty. And since investment affects the change in production capacity, it is export growth that is sensitive to the level of uncertainty.

On measurement grounds, there is a presumption in favor of the level of uncertainty – because uncertainty itself pertains to the expected change in policy. Indeed, the literature on trade policy uncertainty often measures the level of policy uncertainty as the gap between the applied tariff rates and the WTO tariff bindings, since countries are legally allowed to change their tariffs within this band. Finally, the unconditional correlations presented in Figure 2 also create a stronger presumption in favor of the relationship between the level of uncertainty and the change in trade.

Our main specification, therefore, includes the level of uncertainty – i.e. the log of the Economic Policy Uncertainty ($EPU_{c,t}$) index – but we will examine the relationship with the change in uncertainty as a robustness test. The baseline estimation equation becomes:

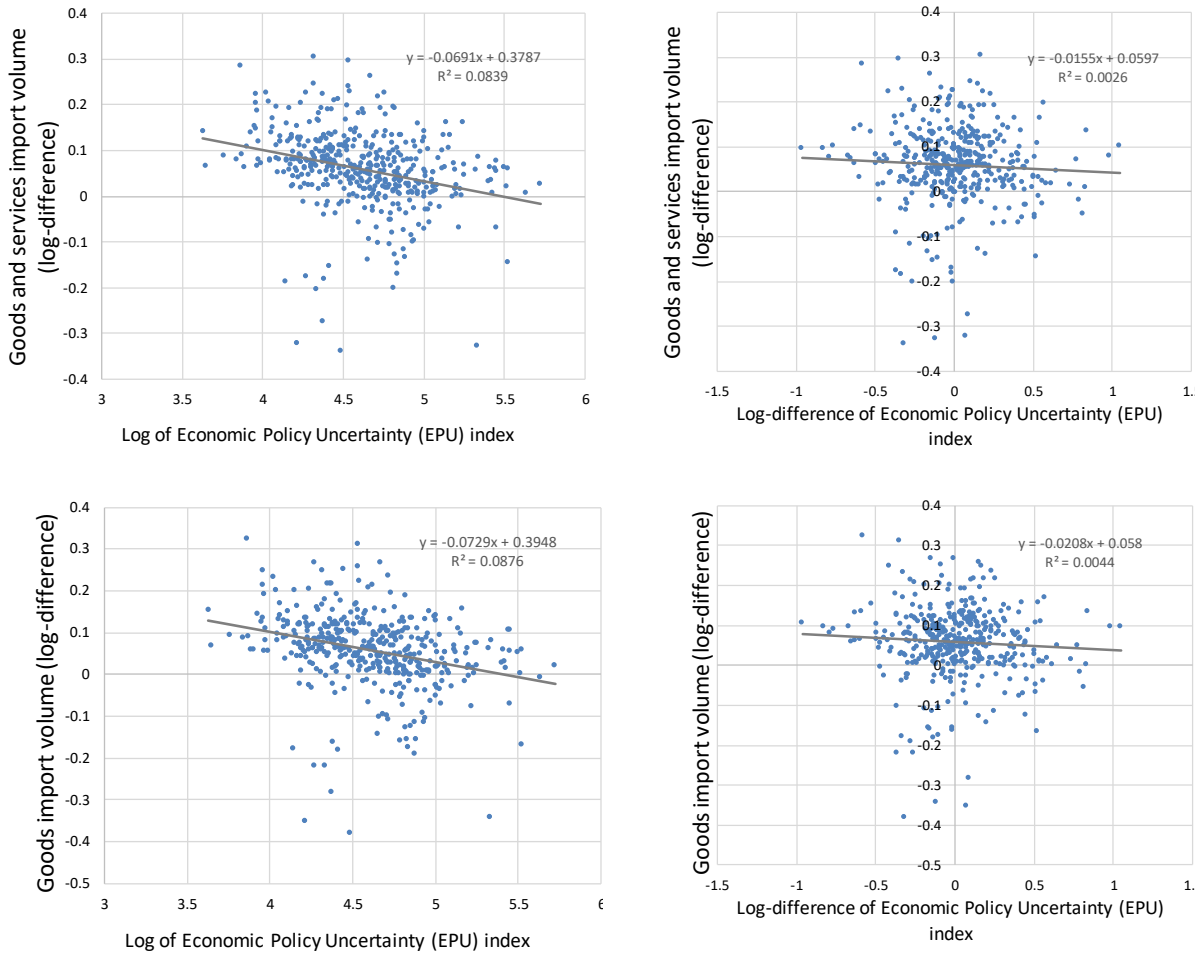
$$\Delta \ln M_{c,t} = \alpha + \beta * \Delta \ln GDP_{c,t} + \gamma * \Delta \ln REER_{c,t} + \delta * \ln EPU_{c,t} + FE_c + FE_t + \varepsilon_{c,t} \quad (2)$$

In addition to examining the contemporaneous association between policy uncertainty and trade growth, we look at coefficients of lagged policy uncertainty as the effects of policy uncertainty shocks may take time to unfold.

We check the robustness of results in multiple ways. These include: using the ratio of the import price deflator to GDP deflator as an alternative to REER; including changes in economic policy uncertainty rather than levels; including lags of the dependent variables and controls; and varying the scope of goods and services used in the dependent variable (so that, in addition to overall goods and services imports, we look at: total goods imports, imports of goods classified by main end use, imports of goods and services that are related to participation in global value chains (GVCs) etc.).

Our measure of policy uncertainty is the Economic Policy Uncertainty (EPU) index compiled by Baker, Bloom and Davis (2016) and available with monthly frequency from www.PolicyUncertainty.com. Baker, Bloom and Davis (2016) have developed the EPU index for 22 countries using frequency counts of newspaper articles that contain terms pertaining to the trio of economy, policy, and uncertainty. The 22 countries are: Australia, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, India, Ireland, Italy, Japan, Mexico, Netherlands, Russian Federation, Republic of Korea, Singapore, Spain, Sweden, United Kingdom, and United States. The EPU index is strongly related to other measures of economic uncertainty, such as stock market volatility, and economic variables such as industrial production and unemployment rates.

Figure 2. Import volume growth and policy uncertainty, by country and year: for goods and services imports and for goods imports and using level or change of policy uncertainty



Source: International Monetary Fund World Economic Outlook, www.PolicyUncertainty.com (Baker et al. 2016), and authors' calculations.

The sources used for the other variables depend on the specification and are listed in Table 1. All estimation samples cover the period from 1995 through 2018. Years prior to 1995 are excluded because of the uneven coverage of policy uncertainty and other indicators across countries. Our panel sample includes 18 of the 22 countries for which the policy uncertainty index is available.[1]

[1] The Russian Federation and Mexico behave as outliers; therefore, we exclude them from all specifications. We also exclude India and the Republic of Korea, for which we do not have data on the REER.

Table 1. Data sources

Indicator	Sources and computation
Real GDP	IMF WEO
Real effective exchange rates (REER)	IMF IFS
Import price deflator	WTO Merch. Indices
GDP deflator	IMF WEO
Goods and services import volume	IMF WEO
Goods import volume	IMF WEO
Goods import volume, by main end use (BEC classification)	ratio of UN Comtrade (WITS) values to "import price deflator"
Backward GVC participation: intermediate imports embodied in exports	ratio of WIOD - derived values to "import price deflator"

Notes: IMF WEO: International Monetary Fund World Economic Outlook, Oct. 2016; WB GEM: World Bank Global Economic Monitor database, Feb 2017 download; IMF IFS: International Monetary Fund International Financial Statistics; WTO Merch. Indices: World Trade Organization merchandise values annual dataset; WTO Services values: World Trade Organization services annual dataset; UN Comtrade (WITS): United Nations Commodity Trade Statistics Database – data downloaded via World Integrated Trade Solutions (WITS).

In Section 5, we extend the analysis using the World Trade Uncertainty (WTU) index (Ahir et al. 2019) as an alternative to the EPU index. The WTU index captures uncertainty related to trade policy for a set of 143 developed and developing countries from 1996 onwards and is constructed based on the Economic Intelligence Unit (EIU) country reports, by counting the number of times "uncertainty" is mentioned in proximity to a word related to trade. In principle, the fact that the WTU index is specifically designed to capture trade related uncertainty could give it an advantage over the EPU index for studies focusing on the trade policy uncertainty / trade link. Nevertheless, the WTU index is characterized by reduced variability over time compared to the EPU index, which is extreme for some countries. Germany's WTU, for example, is zero throughout the whole period we are studying. Positive values of the index are concentrated in 2018 and 2019, likely reflecting lack of attention given to trade policy uncertainty in media reports in the preceding period.

4. Economic policy uncertainty, trade, and GVCs

Table 2 presents the results of regressions using yearly data. Two alternative dependent variables are used: growth in volumes of goods and services imports and growth in volumes of goods imports. Specifications 1a and 2a include the contemporaneous policy uncertainty measure (computed for each year as an average of the EPU index from January through December), while 1b and 2b include policy uncertainty that is lagged by 2 months (computed for each year as an average of the EPU index from November of the previous year through October of the current year).

Economic policy uncertainty may influence trade by affecting GDP. But policy uncertainty can also have a direct impact on trade. This is the case, for example, when policy uncertainty affects the behavior of foreign firms, leading them to reduce the investment in serving the domestic market. Insofar as the specification above controls for the impact on trade of GDP changes, the coefficient of the policy uncertainty variable can be seen as reflecting the direct effect on trade.

The regression results indicate a statistically significant relationship between economic policy uncertainty and trade growth: a 1 percent increase in uncertainty is associated with a 0.02-percentage point reduction in import volume growth. The relationship with goods alone is as strong as for goods and services together, even though border policies affecting goods trade (e.g. tariffs) are easier for

governments to change and therefore should be more sensitive to uncertainty than behind-the-border policies affecting services trade (e.g. domestic regulations).[2] Growth in Real GDP and REER have the expected signs and are significant. The results are robust to specifications that allow dynamic effects in both the dependent variable and covariates such as growth in real GDP and growth in REER (table A1).

Table 2. Association between import volume growth and economic policy uncertainty: estimations using yearly data

Dependent variables:	Growth in goods and services import volume		Growth in goods import volume	
	(1a)	(1b)	(2a)	(2b)
Log of Economic Policy Uncertainty (EPU) index	-0.0223**	-0.0242***	-0.0228**	-0.0248**
	(0.00800)	(0.00831)	(0.00904)	(0.00899)
Growth in Real GDP	1.429***	1.429***	1.409***	1.409***
	(0.201)	(0.202)	(0.273)	(0.274)
Growth in Real effective exchange rate	0.155	0.153	0.164*	0.162*
	(0.1000)	(0.0996)	(0.0876)	(0.0872)
Constant	0.171***	0.178***	0.178***	0.186***
	(0.0432)	(0.0440)	(0.0501)	(0.0505)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R-squared	0.701	0.702	0.684	0.686
Number of observations	407	407	407	407

Source: International Monetary Fund World Economic Outlook, International Monetary Fund International Financial Statistics, World Trade Organization, World Bank World Development Indicators, www.PolicyUncertainty.com, Baker et al. (2016), and authors' calculations. See Table 1 for details on sources and definitions. Notes: Heteroscedasticity-robust standard errors corrected for clustering at country level are reported in parentheses. * p<0.10; ** p<0.05; *** p<0.01. Panel covers 18 countries and period 1995-2018. Growth indicators are computed as log-differences. A lag effect is allowed in specifications 1b and 2b. Specifically, the EPU aggregate for year *t* is based on monthly indexes from January through December of year *t*, in specifications 1a and 2a, and from November of year *t-1* through October of year *t*, in specifications 1b and 2b. Results for goods import volume specifications are robust to using data on goods import volume from World Trade Organization.

Looking at the components of trade may help illuminate the economic channels through which policy uncertainty affects trade. In principle, there are at least four channels. First, EPU could lead to precautionary cuts in all consumer spending, which would be reflected immediately in lower consumer goods imports. Second, EPU can reduce the incentives for foreign firms to invest in enhancing capacity to serve the market. We would expect a negative impact on imports across all sectors with a lag.[3] Third, EPU could erode the incentives for domestic firms to invest in general. Apart from the effect of these choices on future prices and trade (see Handley and Limao, 2016), the reduced investment could lead immediately to lower imports of capital goods. Fourth, EPU could hurt GVC participation by dampening domestic firms' incentives to invest in relationships with foreign input suppliers, and eventually source less inputs from abroad.

The available evidence supports relatively strongly the first and the second channels, though it is not easy to isolate their separate effects (Table 3). The instantaneous effect on consumer spending is revealed in row 1, column 1. That these effects on consumer spending encompass non-durable goods only, and persist over time, is shown in row 5. The lagged effect on imports may reflect the shrunken capacity of foreign firms to serve the domestic market, but it could also reflect persistent dampening of

[2] Data on services import volumes are not reported separately by any international organization. Therefore, we do not run a separate regression for services import volumes.

[3] The intensity of impact may, of course, differ across sectors depending on the importance of up-front investments, but we have little data on these differences.

domestic consumer spending. There is some support for the third and fourth channels. While investment in transport equipment does not seem to be affected at all (row 3), investment in other capital goods appears to be affected gradually but significantly (row 2). Finally, there are also signs of a gradual negative impact on GVC trade, measured by imports used to produce exports, suggesting that GVCs are sensitive to EPU (row 6).

Table 3. Coefficients of economic policy uncertainty in various specifications using yearly data

Dependent variable: growth in the import volume of		A. Relative prices: REER			B. Relative prices: ratio of import deflator to GDP deflator		
		log of EPU index	log of EPU index - lagged 2 months	log of EPU index - lagged 6 months	log of EPU index	log of EPU index - lagged 2 months	log of EPU index - lagged 6 months
(1)	Goods	-0.0228**	-0.0248**	-0.0179**	-0.0270**	-0.0279**	-0.0187**
(2)	Capital goods (excl. transport equipment)	-0.0430*	-0.0497**	-0.0389*	-0.0465*	-0.0516**	-0.0385*
(3)	Capital goods (transp.equipment)	-0.0318	-0.0278	-0.0394	-0.0402	-0.0296	-0.0369
(4)	Durable consumer goods	-0.00777	-0.0150	-0.0136	-0.0170	-0.0217	-0.0156
(5)	Non-durable consumer goods	-0.0258*	-0.0309**	-0.0225**	-0.0359**	-0.0397***	-0.0277**
(6)	Backward GVC participation (intermediate goods and services embodied in exports)	-0.0244	-0.0386**	-0.0398*	-0.0228	-0.0370*	-0.0381

Sources: International Monetary Fund World Economic Outlook, World Bank Global Economic Monitor, International Monetary Fund International Financial Statistics, World Trade Organization, World Input Output Database (WIOD), www.PolicyUncertainty.com, Baker et al. (2016), and authors' calculations. See Table 1 for details. Notes: Heteroscedasticity-robust standard errors corrected for clustering at country level. * p<0.10; ** p<0.05; *** p<0.01. Panel covers 18 countries. Period covered is 1995-2018 in specification (1) 1995-2017 in specifications (2)-(4) and 1995-2014 in specification (5). Growth indicators are computed as log-differences. The number reported in each cell comes from a specific regression and represents the coefficient of log of EPU index, either contemporaneous or lagged, depending on the specification. All regressions include country and time fixed effects as well as controls for growth in absorption and in relative prices.

A simple calculation based on our main specification in Table 2 indicates that EPU may explain a significant proportion of the recent decline in trade growth. Since the EPU index increased by approximately 50 percent from mid-2018 to mid-2019 relative to the same period in the previous year, increased policy uncertainty may have reduced growth in goods and services import volumes by one percentage point (i.e., 50*0.02). Preliminary estimates from the CPB World Trade Monitor suggest a difference in the growth rates of global merchandise import volumes of –3 percentage points between the same two periods, which implies that economic policy uncertainty could explain about a third of the decline in trade growth.

We undertake a number of tests to assess the robustness of the relationship between economic policy uncertainty and trade growth. Varying the scope of import volume growth to cover goods and services, goods alone (using data from different sources), using dynamic specifications, and/or replacing REER by the ratio of import price deflator to GDP deflator, consistently yield negative and significant coefficients of policy uncertainty (Tables 3 and A1). The use of changes in economic policy uncertainty instead of levels also leads to consistently significant coefficients of interest (Table 4). Trade policy creates a wedge between domestic and international prices which is accounted for by our measures of relative prices. Nevertheless, to rule out a potential omitted variable bias, we run regressions that explicitly control for trade policy in the form of tariffs and find that the coefficient of policy uncertainty is not affected (see Appendix Table A2).

Table 4. Association between import volume growth and economic policy uncertainty growth: estimations using yearly data

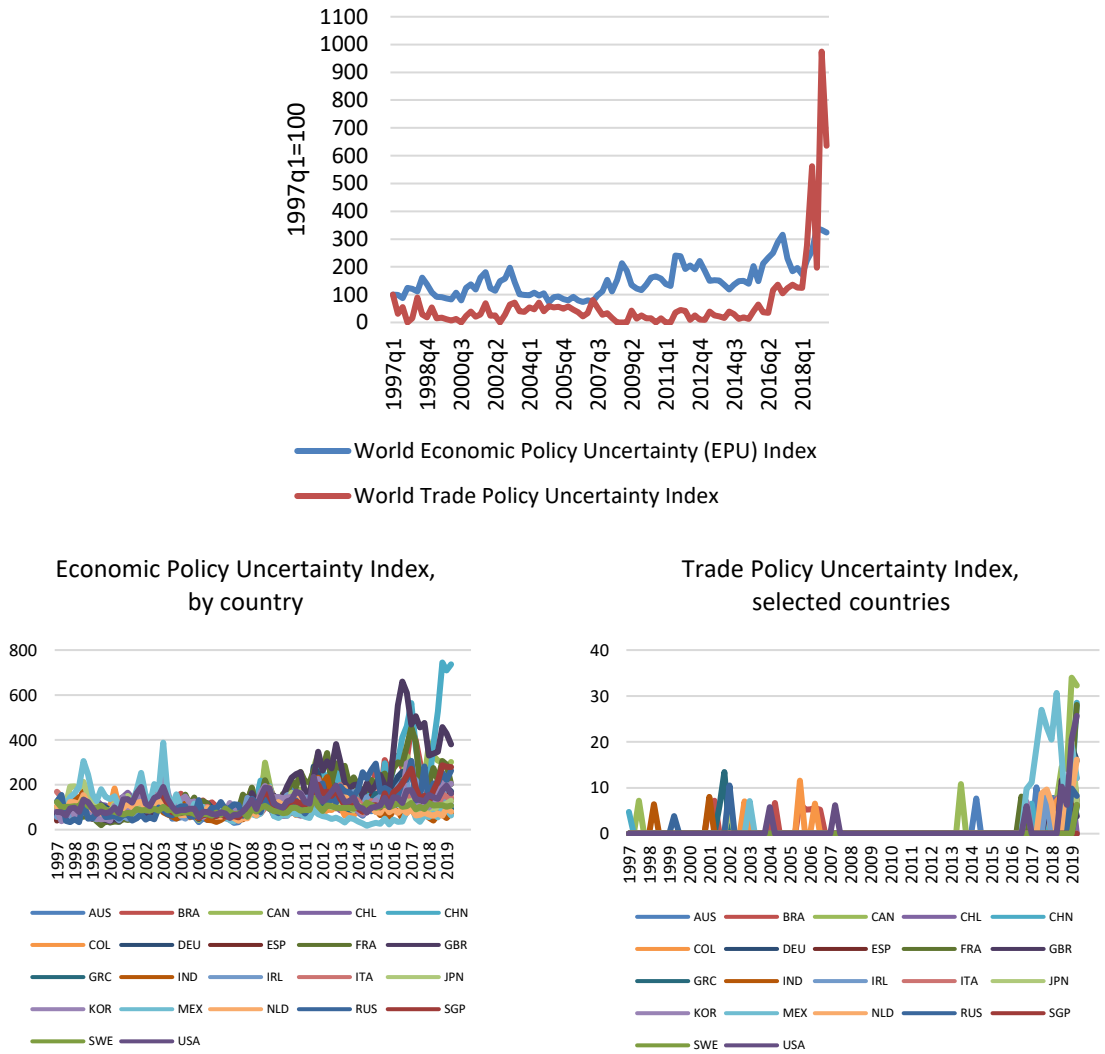
Dependent variables:	Growth in goods and services import volume		Growth in goods import volume	
	(1a)	(1b)	(2a)	(2b)
Growth in the Economic Policy Uncertainty (EPU) index	-0.0290**	-0.0377**	-0.0378**	-0.0462***
	(0.0135)	(0.0135)	(0.0164)	(0.0158)
Growth in Real GDP	1.464***	1.457***	1.441***	1.435***
	(0.212)	(0.212)	(0.285)	(0.284)
Growth in Real effective exchange rate	0.160	0.154	0.169*	0.163*
	(0.0989)	(0.0976)	(0.0829)	(0.0812)
Constant	0.0719***	0.0703***	0.0755***	0.0737***
	(0.0162)	(0.0152)	(0.0183)	(0.0168)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R-squared	0.702	0.707	0.690	0.695
Number of observations	399	399	399	399

Source: International Monetary Fund World Economic Outlook, International Monetary Fund International Financial Statistics, www.PolicyUncertainty.com, Baker et al. (2016), and authors' calculations. See Table 1 for details. Notes: Heteroscedasticity-robust standard errors corrected for clustering at country level are reported in parentheses. * p<0.10; ** p<0.05; *** p<0.01. Panel covers 18 countries and period 1995-2018. Growth indicators are computed as log-differences. A lag effect is allowed in specifications (1b) and (2b). Specifically, the EPU aggregate for year *t* is based on monthly indexes from January through December of year *t*, in specifications (1a) and (2a), and from November of year *t-1* through October of year *t*, in specifications (1b) and (2b).

5. Trade policy uncertainty, trade, and GVCs

We next use the World Trade Uncertainty (WTU) Index instead of the Economic Policy Uncertainty Index as a measure of policy uncertainty. The behavior of the WTU Index differs from the broader indicator of economic policy uncertainty, as shown in Figure 3. The different pattern captures the large increase in trade policy uncertainty in the post-2017 period, although the limited (in some cases no) variability of the WTU Index in previous years may also reflect the lack of attention to trade policy uncertainty in media reports in the pre-2017 period as discussed in Section 3.

Figure 3. The Economic Policy Uncertainty (EPU) Index versus the Trade Policy Uncertainty Index.



Sources: www.PolicyUncertainty.com, Baker et al. 2016), Ahir et al (2019)

The regression results in Tables 5 and 6 show no statistically significant impact of trade policy uncertainty on overall trade growth (Table 5) or on GVC trade growth (Table 6). In addition to the low variability over time of the indicator, two other factors might help explain this result. First, the inability of the index to distinguish between uncertainty created by threats of new protection and uncertainty generated by promises to liberalize. Second, the measure fails to distinguish between own-trade policy uncertainty or third country policy uncertainty. The latter caveat might also affect the EPU index, but to a lesser degree given that the EPU index captures several types of policy uncertainty in addition to the one related to trade.

To dig deeper, we interact the indicator of trade policy uncertainty with country dummies to investigate how this type of uncertainty varies by country. Table 5 indicates a statistically significant relationship between trade policy uncertainty and import volume growth for eight out of twenty countries. We also find more countries with coefficients that are both positive and significant. These findings may in part be attributed to the that fact that the WTU Index could under-report the level of trade policy uncertainty before 2017 and does not disentangle negative uncertainty, related for example

to expectations of a rise in protection, and positive uncertainty, related to expected declines in protection or implementation of trade agreements. Indeed, positive and significant coefficients are found for countries like Brazil and Canada, possibly in anticipation of trade diverting effects of the escalation of US-China trade tensions.

The results for GVC trade are presented in Table 6. Similarly to overall trade, we fail to find a statistically significant effect between trade policy uncertainty as measured by the WTU index and GVC trade. More research is needed to better understand whether this result depends on the nature of the indicator of trade policy uncertainty or the potentially complex interaction between trade growth and trade policy uncertainty. When we analyze the results at the country level, we find that increases in the trade policy uncertainty index are associated with both negative and positive trade growth. One interesting finding is that, for countries with known engagement in GVCs such as China and Ireland, we still get an impact of uncertainty on trade that is negative, statistically significant and driven by a stronger association with GVC-trade than non GVC trade. Of course, for both these countries direct trade policy uncertainty is likely have been the dominant force because of US-China tensions and the uncertainty over Brexit.

Table 5. Association between import volume growth and the World Trade Uncertainty (WTU) index

Coefficient of Log(Trade Uncertainty index+1)	Growth in goods and services import volume				Growth in goods import volume			
	contemporaneous		lagged 2 months		contemporaneous		lagged 2 months	
	(1a)	(1b)	(2a)	(2b)	(1a)	(1b)	(2a)	(2b)
Average	-0.00338		-0.000337		0.000142		0.00425	
	(0.00714)		(0.00762)		(0.00652)		(0.00662)	
Australia (AUS)		-0.00769*		-0.00171		-0.00496		-0.000276
		(0.00434)		(0.00591)		(0.00479)		(0.00536)
Brazil (BRA)		0.0208***		0.0248***		0.0312***		0.0379***
		(0.00490)		(0.00417)		(0.00628)		(0.00540)
Canada (CAN)		0.00694**		0.00826*		0.0121**		0.0145**
		(0.00317)		(0.00465)		(0.00437)		(0.00552)
Chile (CHL)		0.00474		0.00595		0.00759		0.0106
		(0.00696)		(0.00485)		(0.00849)		(0.00709)
China (CHN)		-0.0138**		-0.00425		-0.00949		-0.00263
		(0.00597)		(0.00896)		(0.00765)		(0.00717)
Colombia (COL)		-0.00116		0.0201***		0.00446		0.0260***
		(0.00831)		(0.00449)		(0.00936)		(0.00540)
France (FRA)		0.0138		0.0123		0.0237**		0.0221**
		(0.00889)		(0.00944)		(0.0104)		(0.0106)
United Kingdom (GBR)		-0.0160***		-0.0138***		-0.0183**		-0.0191**
		(0.00501)		(0.00475)		(0.00716)		(0.00696)
Greece (GRC)		-0.0418***		-0.0834***		-0.0410***		-0.0578***
		(0.0105)		(0.0130)		(0.0120)		(0.0140)
Ireland (IRL)		-0.148***		-0.0443***		-0.0880***		-0.0183*
		(0.00739)		(0.00585)		(0.00948)		(0.00890)
Japan (JPN)		0.0328*		0.0244		0.0129		0.00658
		(0.0181)		(0.0170)		(0.0163)		(0.0162)
Mexico (MEX)		0.00261		0.00432		0.00239		0.00332
		(0.00249)		(0.00336)		(0.00301)		(0.00324)
Netherlands (NLD)		-0.0197***		-0.0165*		-0.0144**		-0.0119
		(0.00533)		(0.00815)		(0.00646)		(0.00864)
Russian Federation (RUS)		-0.0518**		-0.0570***		-0.0579***		-0.0617***
		(0.0197)		(0.0191)		(0.0199)		(0.0191)
United States (USA)		0.00380		0.0109		0.00224		0.00799
		(0.00397)		(0.00777)		(0.00533)		(0.00809)
Growth in Real GDP	1.630***	1.675***	1.629***	1.674***	1.560***	1.600***	1.558***	1.593***
	(0.155)	(0.159)	(0.155)	(0.160)	(0.216)	(0.224)	(0.216)	(0.229)
Growth in Real effective exchange rate	0.301**	0.294*	0.302**	0.297**	0.315**	0.305**	0.316**	0.308**
	(0.141)	(0.142)	(0.142)	(0.141)	(0.144)	(0.145)	(0.145)	(0.144)
Lagged growth in tariff rate	-0.0129	-0.0161	-0.0131	-0.0182	-0.0233	-0.0262	-0.0240	-0.0288
	(0.0174)	(0.0203)	(0.0174)	(0.0212)	(0.0218)	(0.0232)	(0.0216)	(0.0232)
Constant	0.0161	0.0152	0.0160	0.0149	0.0203	0.0200	0.0201	0.0202
	(0.0117)	(0.0121)	(0.0117)	(0.0118)	(0.0137)	(0.0139)	(0.0137)	(0.0137)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.695	0.713	0.694	0.707	0.671	0.682	0.671	0.681
Number of observations	458	458	458	458	458	458	458	458

Source: International Monetary Fund World Economic Outlook, International Monetary Fund International Financial Statistics, World Trade Organization, World Bank World Development Indicators, www.PolicyUncertainty.com, Baker et al. (2016), and authors' calculations. See Table 1 for details on sources and definitions. Notes: Heteroscedasticity-robust standard errors corrected for clustering at country level are reported in parentheses. * p<0.10; ** p<0.05; *** p<0.01. Panel covers period 1995-2018. Growth indicators are computed as log-differences. A lag effect is allowed in specifications 2a, 2b and 2c. Specifically, the EPU aggregate for year *t* is based on monthly indexes from January through December of year *t*, in specifications 1a, 1b and 1c, and from November of year *t-1* through October of year *t*, in specifications 2a, 2b and 2c. Results for goods import volume specifications are robust to using data on goods import volume from World Trade Organization.

Table 6. GVCs and the World Trade Uncertainty (WTU) index

Coefficient of Log (Trade Uncertainty index+1)	contemporaneous				lagged (2 months)			
	(1a)		(1b)		(2a)		(2b)	
	GVC-related	non GVC-related	GVC-related	non GVC-related	GVC-related	non GVC-related	GVC-related	non GVC-related
Average	-0.00122	0.0178*			0.00755	0.0253**		
	(0.0118)	(0.00926)			(0.0118)	(0.00966)		
Australia (AUS)			0.0145**	-0.00539			0.0197***	-0.000166
			(0.00676)	(0.00676)			(0.00657)	(0.00657)
Brazil (BRA)			0.0132**	0.0754***			0.0191***	0.0818***
			(0.00581)	(0.00581)			(0.00500)	(0.00500)
Canada (CAN)			0.0192***	0.0159**			0.0277***	0.0241***
			(0.00626)	(0.00626)			(0.00553)	(0.00553)
Chile (CHL)			0.0179*	0.0170*			0.0393***	0.0191*
			(0.00886)	(0.00886)			(0.0105)	(0.0105)
China (CHN)			-0.234***	-0.0159**			-0.232***	-0.0144*
			(0.00775)	(0.00775)			(0.00783)	(0.00783)
Colombia (COL)			0.00139	0.0300***			0.0170	0.0412***
			(0.00917)	(0.00917)			(0.0123)	(0.0123)
Spain (ESP)			0.000280	-0.00499				
			(0.0243)	(0.0243)				
France (FRA)			0.0200**	0.00427			0.0174*	0.00164
			(0.00971)	(0.00971)			(0.00951)	(0.00951)
United Kingdom (GBR)			-0.0394***	-0.0207**			-0.0126	-0.00350
			(0.00958)	(0.00958)			(0.0106)	(0.0106)
Greece (GRC)			-0.0528***	-0.0311***			-0.0319***	-0.0267**
			(0.00884)	(0.00884)			(0.0105)	(0.0105)
Ireland (IRL)			-0.0650***	0.0373***			0.0243*	0.0987***
			(0.00973)	(0.00973)			(0.0128)	(0.0128)
Japan (JPN)			0.0678***	0.0348***			0.0630***	0.0300**
			(0.0114)	(0.0114)			(0.0117)	(0.0117)
Mexico (MEX)			0.0187***	0.0150***			0.0253***	0.0202***
			(0.00424)	(0.00424)			(0.00417)	(0.00417)
Netherlands (NLD)			-0.000512	0.00524			0.00361	0.0120
			(0.00627)	(0.00627)			(0.00824)	(0.00824)
Russian Federation (RUS)			-0.0403***	0.0463***			-0.0439***	0.0426***
			(0.00925)	(0.00925)			(0.00968)	(0.00968)
United States (USA)			0.00956*	-0.0143**			0.0120	-0.00219
			(0.00563)	(0.00563)			(0.00730)	(0.00730)
Growth in Real GDP	1.800***		1.795***		1.794***		1.780***	
	(0.221)		(0.230)		(0.220)		(0.232)	
Growth in Real effective exchange rate	0.242***		0.237***		0.244***		0.240***	
	(0.0683)		(0.0724)		(0.0682)		(0.0712)	
Growth in tariff rate	0.0200		0.0125		0.0185		0.0114	
	(0.0298)		(0.0315)		(0.0293)		(0.0313)	
Constant	-0.0190		-0.0212		-0.0194		-0.0206	
	(0.0135)		(0.0143)		(0.0135)		(0.0143)	
Country fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R-squared	0.562		0.581		0.563		0.582	
Number of observations	906		906		906		906	

Sources: International Monetary Fund World Economic Outlook, World Bank Global Economic Monitor, International Monetary Fund International Financial Statistics, World Trade Organization, World Input Output Database (WIOD), www.PolicyUncertainty.com, Ahir et al. (2019), and authors' calculations. See Table 1 for details. Notes: Heteroscedasticity-robust standard errors corrected for clustering at country level. * p<0.10; ** p<0.05; *** p<0.01. Results in grey indicate that difference between coefficients of GVC-related and non-GVC related indicators is not statistically different from zero. Panel covers period 1995-2018. Growth indicators are computed as log-differences.

6. Conclusion

Trade growth has been subdued since the global financial crisis; the evidence presented in this paper suggests that the increase in policy uncertainty in recent years may have been an important overlooked factor contributing to the slow growth of world trade. Specifically, we use new data on economic policy uncertainty for a sample of 18 countries and 24 years from Baker et al. (2016) and find a statistically significant relationship between this measure of policy uncertainty and growth in trade, including trade linked to GVCs.

The analysis presented in this paper is meant to draw attention to a potentially important relationship, rather than to establish a definitive connection. First, it is hard to infer a causal relationship between policy uncertainty and trade because policy itself responds to economic circumstances and is likely to be forward looking. Second, when studying GVCs, it is hard at this stage to disentangle the contrasting forces that link global value chains and uncertainty. This does not allow us to properly test whether the consequences of uncertainty are more serious for GVC trade. Finally, we would want to separate

different types of economic policy uncertainty and their effect on trade and global value chains. However, the available data do not allow for a precise test. Addressing these data and conceptual issues should be the focus of future research in this area.

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Table A1. Coefficients of economic policy uncertainty in dynamic specifications using yearly data

	Dependent variable: growth in the import volume of	A. Relative prices: REER			B. Relative prices: ratio of import deflator to GDP deflator		
		log of EPU index	log of EPU index - lagged 2 months	log of EPU index - lagged 6 months	log of EPU index	log of EPU index - lagged 2 months	log of EPU index - lagged 6 months
(1)	Goods and services: lagged dep. var.	-0.0204**	-0.0222**	-0.0152**	-0.0248**	-0.0257**	-0.0169**
(2)	Goods and services: lagged covariates (real GDP and REER)	-0.0328***	-0.0335***	-0.0237**	-0.0331***	-0.0318***	-0.0205**
(3)	Goods and services: lagged dep. var. and covariates	-0.0304***	-0.0310***	-0.0200**	-0.0303***	-0.0289***	-0.0162**
(4)	Goods (IMF data): lagged dep. var.	-0.0225**	-0.0245**	-0.0172**	-0.0266**	-0.0277**	-0.0177*
(5)	Goods (IMF data): lagged covariates (real GDP and REER)	-0.0348***	-0.0358***	-0.0251**	-0.0333**	-0.0319**	-0.0186*
(6)	Goods (IMF data): lagged dep. var. and covariates	-0.0337**	-0.0347**	-0.0234**	-0.0311**	-0.0297**	-0.0153
(7)	Goods (WTO data): lagged dep. var.	-0.0245**	-0.0272**	-0.0190*	-0.0241*	-0.0263**	-0.0178
(8)	Goods (WTO data): lagged covariates (real GDP and REER)	-0.0372**	-0.0390***	-0.0272**	-0.0318**	-0.0320**	-0.0185
(9)	Goods (WTO data): lagged dep. var. and covariates	-0.0340**	-0.0356***	-0.0231**	-0.0271**	-0.0271**	-0.0128

Sources: International Monetary Fund World Economic Outlook, World Bank Global Economic Monitor, International Monetary Fund International Financial Statistics, World Trade Organization, World Input Output Database (WIOD), www.PolicyUncertainty.com, Baker et al. (2016), and authors' calculations. See Table 1 for details. Notes: Heteroscedasticity-robust standard errors corrected for clustering at country level. * p<0.10; ** p<0.05; *** p<0.01. Panel covers 18 countries and period 1995-2018. Growth indicators are computed as log-differences. The number reported in each cell comes from a regression and represents the coefficient of log of EPU index, either contemporaneous or lagged, depending on the specification. All regressions include country and time fixed effects as well as controls for growth in absorption and in relative prices.

Table A2. Coefficients of economic policy uncertainty in specifications that control for tariffs

	Dependent variable: growth in the import volume of	A. Relative prices: REER			B. Relative prices: ratio of import deflator to GDP deflator		
		log of EPU index	log of EPU index - lagged 2 months	log of EPU index - lagged 6 months	log of EPU index	log of EPU index - lagged 2 months	log of EPU index - lagged 6 months
(1)	Goods and services	-0.0216**	-0.0235**	-0.0175**	-0.0256**	-0.0265**	-0.0188**
(2)	Goods	-0.0219**	-0.0238**	-0.0170**	-0.0259**	-0.0268**	-0.0176**

Sources: International Monetary Fund World Economic Outlook, International Monetary Fund International Financial Statistics, www.PolicyUncertainty.com, Baker et al. (2016), and authors' calculations. See Table 1 for details. The tariff measure is obtained from TRAINS (via WITS) and it represents, for each country and year, the simple average of MFN tariffs.
Notes: Heteroscedasticity-robust standard errors corrected for clustering at country level. * p<0.10; ** p<0.05; *** p<0.01. Panel covers 18 countries and period 1995-2018. Growth indicators are computed as log-differences. The number reported in each cell comes from a regression and represents the coefficient of log of EPU index, either contemporaneous or lagged, depending on the specification. All regressions include country and time fixed effects as well as controls for growth in absorption and in relative prices.

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