



WIDER Working Paper 2020/59

The effect of policy uncertainty on South Africa, SADC, and beyond

Mustapha Douch*

May 2020

Abstract: The principal contribution of this paper is to investigate the relationship between policy uncertainty, caused by recent developments in international markets, and firms' trade margins for the largest economy in Africa: South Africa. In particular, using a unique database on the population of traders, we investigate the exogenous result of the Brexit referendum and assess its impact on South African exporters' and importers' participation in the global market. Furthermore, we provide evidence of how this shock has had heterogeneous effects across different firm sizes, as well as across different product-specific tariffs, preferential trade agreements, and gravity model variables. We provide evidence of how the potential increase in trade barriers—through an increase in tariffs—has had a negative impact on the trade activity from uncertain markets, especially for small firms.

Key words: Brexit, policy uncertainty, preferential trade agreement, trade margins

JEL classification: E65, F01, F13, F14

* Department of Economics, Lloyds Banking Centre, ABS, Aston University, Birmingham, UK, m.douch@aston.ac.uk

This study has been prepared within the UNU-WIDER project [Southern Africa – Towards Inclusive Economic Development \(SA-TIED\)](#).

Copyright © UNU-WIDER 2020

Information and requests: publications@wider.unu.edu

ISSN 1798-7237 ISBN 978-92-9256-816-0

<https://doi.org/10.35188/UNU-WIDER/2020/816-0>

Typescript prepared by Gary Smith.

The United Nations University World Institute for Development Economics Research provides economic analysis and policy advice with the aim of promoting sustainable and equitable development. The Institute began operations in 1985 in Helsinki, Finland, as the first research and training centre of the United Nations University. Today it is a unique blend of think tank, research institute, and UN agency—providing a range of services from policy advice to governments as well as freely available original research.

The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland, Sweden, and the United Kingdom as well as earmarked contributions for specific projects from a variety of donors.

Katajanokanlaituri 6 B, 00160 Helsinki, Finland

The views expressed in this paper are those of the author(s), and do not necessarily reflect the views of the Institute or the United Nations University, nor the programme/project donors.

1 Introduction

A key feature of the last few years is increasing policy and trade uncertainties around the globe. On the one hand, the increasing tensions in Europe, in particular between the EU and the UK, have led to a rise of protectionist ideologies that have increased business fears about future trade relations. This has been further amplified by the rise of a trade war between the USA and China, which has led to a considerable increase in tariffs and potentially in non-tariff barriers between the two trading blocks. Indeed, these events have caused global shocks and threatened how businesses engage in the world trading system (i.e. due to the fragmentation of production and value chains; Handley and Limão 2017a). But they affect also how firms decide to undertake investments, in particular sunk cost ones, which in turns affect firms' productivity and growth. This is because policy commitment and credibility in international markets are key driving factors for business success (Handley 2014; Limão and Maggi 2015; Tang and Wei 2009). Thus, in the light of economic shocks, firms may decide to wait until they have a better idea about future conditions before investing. Furthermore, these uncertainties may affect also employment by shifting towards less labour-intensive production (Pierce and Schott 2016).

Trade wars and trade uncertainty also have important implications for consumer welfare, employment, and prices, because uncertainties are equivalent to a tariff increase (Osnago et al. 2015); thus, they affect domestic prices as imported goods become relatively more expensive, leading to a potential increase in inflation. This combined with a slowing down of economic growth—due to industrial output falls and weaker retail sales—has important implications for the aggregate economy (Born et al. 2019; Dhingra et al. 2017) as business confidence may be affected. This topic has received considerable attention both in the USA and China (Curren et al. 2019). In turn, these macroeconomic shocks may affect labour market dynamics and increase the prospects of higher future unemployment levels (Pierce and Schott 2016).

We contribute to this debate by examining the impact of policy uncertainty on trade margins for the largest economy in Africa: South Africa. This is particularly relevant as mainstream research in this debate has mainly focused on developed economies (e.g. Crowley et al. 2018; Douch et al. 2019; Limão and Maggi 2015) rather than emerging economies, mainly due to the lack of detailed firm-transaction-level data, which are needed to outline and analyse the impact of uncertainties on businesses' trade. Using a novel and unique database that covers the population of traders with detailed firm-level transactions, we test how macroeconomic shocks have affected their trade decisions. Thereby, we investigate how these policy shocks affect the international trade activity of South Africa's firms by analysing whether it has had a greater effect on export values or whether it manifests more through transaction margins (i.e. the number of products and destinations). This differentiation offers new insight on how policy uncertainty may affect economic activity as firms may incur substantial fixed costs before engaging in international markets (Roberts and Tybout 1997), and this may be amplified during periods of high macroeconomic shocks.

Using a unique and detailed database on the population of traders, which allows us to build granular measures of trade margins at the firm level, we find a significant negative effect of uncertainties both on values of exports (imports), and on transaction dimensions—that is, the number of products and number of destinations served. In particular, using the Brexit referendum shock as a natural field experiment (Born et al. 2019; Douch et al. 2018a) and a difference-in-differences identification strategy, we estimate the impact of a change in global uncertainty on South African traders. In particular, the results highlight significant heterogeneity across business size. In other words, small firms are most affected by increasing uncertainties, and this has led to a decline in the growth of their trade margins, leading to a fall in international penetration. Furthermore, the breakdown by trading partner and country aggregates highlights a significant decline in trade activity with the UK and EU countries. Nevertheless, these effects are heterogeneous not only across firm size, but also depending on the product tariff exposure. For

exporters, in particular, we find that there has been a negative uncertainty effect from rich countries, but a positive growth with respect to middle-income, countries highlighting that recent opening up towards emerging economies through trade agreements has led to a reduction of uncertainties in those economies and significant gains from trade.

In the next section, we provide a summary of the literature to which this paper is related. In Section 3, we provide a summary of the data used in this paper. Section 4 highlights our methodological approach and identification strategy, then we report the overall baseline specifications and robustness checks in Section 5. Section 6 concludes the paper.

2 Literature review

This paper relates to a number of research topics. Indeed, from the policy uncertainty perspective a number of studies have been developed to investigate its effect on economic activity. In this respect, Freund and McLaren (1999) highlight that policy uncertainty can have significant anticipatory effects. That is, upon joining a regional trade bloc, countries' trade activity tends to experience dynamic adjustment before the date of accession due to anticipatory sunk cost investments. In this respect also, Schmitt-Grohé and Uribe (2012) show that anticipatory shocks may lead to up to half of output volatility, consumption, investment, and employment. On the other hand, Baker et al. (2016) show that an increase in policy uncertainty has a significant effect on firms. In particular, it leads to higher stock price volatility as well as a reduction in investment and employment. Similarly, Born and Pfeifer (2014) show that policy uncertainty, due to policy risk, can have a significant negative effect on output. Indeed, they find that this is mainly driven by a decline in consumption and investments. Also, Fernández-Villaverde et al. (2015) find sizeable effects of policy uncertainty, driven by fiscal volatility shock, on economic activity.

Furthermore, the work by Mumtaz and Surico (2018), which distinguishes different types of policy uncertainty, highlights that one-quarter of output volatility is driven by these uncertainties; however, government debt uncertainty is the main driver in the long run, which also affects investment and business confidence. Barsky and Sims (2011) show how news shocks lead to falling output and investments. This effect is particularly relevant in the medium term. Indeed, Beaudry and Portier (2006) show that news about future technological opportunities, which is captured in part by stock prices, leads to an increase in total factor productivity in the long run, as well as a boom in consumption and investment. Stokey (2016) develops a theoretical model of investment decision that allows firms to temporarily stop investing, to adopt a wait-and-see approach following policy uncertainty about future tax rate changes. Bloom (2009, 2014) highlights that uncertainties have significant impacts on economic activity. In fact, from both microeconomic and macroeconomic perspectives, uncertainties lead to significant effects, especially during recessions compared to booms, also varying in their impact among developed and developing economies.

From a more trade policy uncertainty perspective, Handley and Limão (2015, 2017b) show how these macroeconomic shocks can dampen firms' investment decisions due to sunk export costs. Preferential trade agreements (PTAs) can have positive effects on trade activity in terms of both entry rates and trade volumes. Thus, removal of uncertainties can account for considerable future growth. This can have significant impacts on welfare through prices and consumer income. In fact, a fall in uncertainty may be equivalent to a 13 percentage-point permanent tariff decrease. Similarly, Osnago et al. (2015) highlight trade barriers as a significant factor limiting export activity. They show that on average trade policy uncertainty is equivalent to a level of tariffs between 1.7 and 8.7 percentage points. Moreover, Pierce and Schott (2016) show that industries that are more exposed to trade policies experience higher employment loss and higher competition. However, international policy commitments through trade agreements can mitigate uncertainty particularly during recessions (Carballo et al. 2018).

This paper relates also to a growing literature on the impact of Brexit uncertainty. Indeed, a recent review of papers analysing the impact of uncertainties surrounding Brexit highlight a poorer position for the UK than would otherwise have been. This is important as it may lead to new barriers to trade and migration between the two blocs (Sampson 2017). Using a general equilibrium approach, Dhingra et al. (2017) find that Brexit uncertainty will have a negative welfare effect in both soft-Brexit (remaining in the Single Market) and hard-Brexit (WTO rules) scenarios. Nevertheless, new trade deals are likely to offset potential losses. Estimates of welfare costs of Brexit uncertainty for UK households are in the range 0.4–1.2 per cent (Steinberg 2019). However, also output, measured as gross domestic product, has fallen with the growing uncertainty (Born et al. 2019).

Furthermore, focusing on trade activity, a study by Graziano et al. (2018) shows that at the mean MFN risk (average disagreement tariff of 4.5 per cent), a persistent increase in the probability of Brexit by two standard deviations lowers bilateral export values by 15 log points on average. Moreover, these uncertainties have led to lower entry into export participation of at least 5.2 per cent (Crowley et al. 2018). The Brexit shock has pushed UK exporters to divert their trade into more distant countries, such as Commonwealth and BRICS countries (Douch et al. 2016, 2018a,b).

This paper relates also to trade policies and the literature on trade diversion. For a review of the discussion of trade blocks and trade agreements, see Frankel et al. (1997). Indeed, trade liberalization through agreements has a significant effect on trade creation effects rather than trade diversion (Clausing 2001). Trade agreements can also have substantial impacts on countries' trade volumes, prices, and welfare (Romalis 2007). However, it might lead to a diversion of imports from non-members of the trading bloc towards new partners. This is because high levels of protectionism can lead to significant effects on import trade (Konings et al. 2001; Prusa 2001). Moreover, import-restricting trade policy may lead to distortionary measures for a foreign country's exports to third markets (Bown and Crowley 2007). However, the impact is generally variable across sectors (Vandenbussche and Zanardi 2010). Egger and Nelson (2011) show that, nevertheless, the volume and welfare effects have been negative, but negligible, while Cohen-Meidan (2013) shows that trade policy restrictions may have significant regional variation in their impact on prices, imports, and sales. The likelihood of exit from the export market also increases with increased protectionism (Besedeš and Prusa 2013). Recent evidence on the population of UK exporters shows that this diversion is heterogeneous among traders, affecting small and medium-sized companies rather than large firms (Douch et al. 2019). This suggests that small companies are more likely to suffer from policy uncertainties, which may lead to higher trade diversion.

Finally, this research relates to the literature on gravity models and trade agreements. For a recent review of the former, see Yotov et al. (2016). Key developments in this field concern the development of multilateral resistance (Anderson and Van Wincoop 2003; Head and Mayer 2014); for an analysis of the latter, see Mattoo et al. (2017) and Baier and Bergstrand (2004, 2007).

3 Data

For this analysis we use the complete sample of traders from the customs transaction for South Africa. The database covers the period 2012–17 and reports both import and export trade flows on a monthly basis. It has information on the destination (origin) of exports (imports). The transactions reported are at HS6 standard international classification. We observe about 40,340 exporters over this reference period. The database reports a number of variables, such as customs values of exports and transaction values. However, only transaction values appear to be the right measure of exports, and for the majority of the cases it is denominated in South African rand (ZAR), while the remaining share—about 10 per cent—is denominated in other currencies. Thus, to properly obtain the overall export value, we had to convert all flows to rand using the monthly exchange rate. Table 1 reports the summary statistics of the key variables

of interest: import values, number of transactions, number of products, number of destinations, total new transactions, total new combinations of products, and destinations served by traders on a quarterly basis (our main specification), monthly, and six-monthly. For import flows, the key variable of interest is customs values, which report the value of the transaction in rand. We have information for about 47,649 importers over the 2012–17 period.

Table 1: Summary statistics of South Africa importers pre–post-Brexit referendum

Variables	Brexit= 0			Brexit =1		
	(1) Mean	(2) Std dev.	(3) N	(4) Mean	(5) Std. dev	(6) N
Quarterly						
Import value (rand)	4,273,000	7.896e+07	329,755	5,121,000	6.948e+07	80,337
Import value (USD)	375,754	7.287e+06	329,755	376,073	5.125e+06	80,337
No. destinations	27.72	173.5	329,755	33.57	199.9	80,337
No. products	11.89	29.51	329,755	13.31	31.72	80,337
No. destinations	3.824	5.276	329,755	4.295	6.024	80,337
No. new transactions	4.655	19.39	329,755	4.338	15.13	80,337
No. new products	2.536	4.951	329,755	2.154	4.237	80,337
No. new destinations	0.369	0.784	329,755	0.294	0.688	80,337
Monthly						
No. transactions	11.08	62.13	329,755	13.26	67.13	80,337
No. products	7.599	20.72	329,755	8.607	22.09	80,337
No. destinations	2.784	4.005	329,755	3.153	4.641	80,337
No. new transactions	2.204	7.805	329,755	2.042	6.340	80,337
No. new products	1.310	2.944	329,755	1.120	2.689	80,337
No. new destinations	0.187	0.519	329,755	0.148	0.462	80,337
Semester						
Import value (rand)	8,482,000	1.500e+08	329,755	9,797,000	1.327e+08	80,337
Import value (USD)	745,840	1.387e+07	329,755	718,819	9.782e+06	80,337
No. transactions	54.92	340.0	329,755	63.64	393.7	80,337
No. products	17.17	37.62	329,755	18.24	39.54	80,337
No. destinations	4.875	6.271	329,755	5.284	7.020	80,337
No. new transactions	9.077	37.58	329,755	8.052	29.01	80,337
No. new products	4.880	8.507	329,755	3.922	7.103	80,337
No. new destinations	0.704	1.219	329,755	0.532	1.029	80,337
No. importers	47,649					

Note: statistics at the monthly, quarterly, and semester level are based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. Variables are reported in levels. Total imports are expressed in rand and US dollars. Pre-Brexit considers the period between 2012-Q1 and 2016-Q2; post-Brexit referendum between 2016-Q3 and 2017-Q4.

Source: author's compilation based on data from the South Africa Customs database.

Similarly, Table 2 reports summary statistics for our main variables for exporters. The trend for these traders is relatively similar to that of importers. Indeed, new transactions, products, and destinations on average decline after the Brexit referendum (and potential due to trade war uncertainties). Nevertheless, for both exporters and importers the overall trade margins have increased with some key trading partners.

What emerges from Table 2 is that although the overall export value has increased after the Brexit referendum results, alongside the overall number of transactions, products, and destinations, is that there has been less introduction of new products and destinations by traders. This might be driven by existing exporters not introducing new products or exploring new markets and/or by reduced entry of new exporters.

Table 2: Summary statistics of South Africa exporters pre–post-Brexit referendum

Variables	Brexit= 0			Brexit =1		
	(1) Mean	(2) Std. dev.	(3) N	(4) Mean	(5) Std. dev	(6) N
Quarterly						
Export value (rand)	10,840,000	3.20E+08	285,954	15,360,000	2.12E+08	69,118
Export value (USD)	950,257	3.33E+07	285,954	1,129,000	1.56E+07	69,118
No. transactions	32.26	227.3	285,954	36.91	264.6	69,118
No. products	15.28	44.31	285,954	16.36	47.30	69,118
No. destinations	3.279	4.424	285,954	3.559	4.950	69,118
No. new transactions	6.866	19.81	285,954	6.170	17.01	69,118
No. new products	4.081	9.358	285,954	3.265	7.546	69,118
No. new destinations	0.345	0.756	285,954	0.260	0.648	69,118
Monthly						
No. transactions	12.20	75.91	285,954	14.25	89.79	69,118
No. products	8.879	27.80	285,954	9.827	30.63	69,118
No. destinations	2.368	3.038	285,954	2.583	3.429	69,118
No. new transactions	3.007	8.012	285,954	2.796	7.402	69,118
No. new products	1.872	4.428	285,954	1.564	3.886	69,118
No. new destinations	0.180	0.485	285,954	0.141	0.407	69,118
Semester						
Export value (rand)	21,720,000	4.95E+08	285,954	29,450,000	3.97E+08	69,118
Export value (USD)	1,903,000	5.03E+07	285,954	2,162,000	2.92E+07	69,118
No. transactions	64.05	453.7	285,954	69.84	520.5	69,118
No. products	23.17	61.00	285,954	23.50	62.97	69,118
No. destinations	4.236	5.580	285,954	4.480	6.146	69,118
No. new transactions	13.49	37.67	285,954	11.52	32.06	69,118
No. new products	7.966	17.31	285,954	5.999	13.46	69,118
No. new destinations	0.658	1.206	285,954	0.471	0.992	69,118
No. exporters	40,340					

Note: statistics at the monthly, quarterly, and semester level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. Variables are reported in levels. Total exports are expressed in rand and US dollars. Pre-Brexit considers the period between 2012-Q1 and 2016-Q2, post-Brexit referendum between 2016-Q3 and 2017-Q4.

Source: author's compilation based on data from the South Africa Customs database.

Furthermore, looking at the top trading partners of South Africa, we can see that China dominates both import and export trade, whereas the USA and Germany are the next top destinations and origins of trade. The UK is in seventh position in both flows, as reported in Table 3. Given the recent increase of policy uncertainties among some of these top trading partners, it is likely that South Africa's traders might have been affected by the macroeconomic shocks surrounding trade wars and Brexit.

To visualize these trends, we report in Figure 1 the overall quarterly growth rate of imports and the respective trade margins—that is, the number of overall transactions, number of products exported, and the growth rate of the number of destinations (origins). What emerges from these figures is that the trend has been remarkably stable when looking at the import dynamics until 2016. Indeed, just a few months before the Brexit shock, as uncertainty started to grow, import values started to decline. However, the biggest fall coincided with the triggering of Article 50 by the UK government, which formally started the departure process of the UK from the EU. This period has also seen a growing uncertainty over USA–China trade relations, which further increased global uncertainties. We can see a similar pattern in the growth of transactions. In other words, following the Brexit referendum, and in particular in proximity to the triggering of Article 50, we see large declines in import trade, although on aggregate this sharp fall following the formal process of the UK leaving the EU is followed by a rapid reversal of the trend.

Table 3: Trade shares of top trading partners, 2015

Partner	Trade value	Share	Rank
Imports (USD)			
World	85,510,000,000	100	
China	15,670,000,000	18.327	1
USA	6,012,000,000	7.031	3
India	4,221,000,000	4.936	4
Japan	3,135,000,000	3.666	5
Nigeria	3,031,000,000	3.544	6
UK	2,748,000,000	3.214	7
Saudi Arabia	2,643,000,000	3.091	8
Italy	2,225,000,000	2.603	9
Thailand	2,068,000,000	2.418	10
Exports (USD)			
World	80,300,000,000	100	
China	7,420,000,000	9.245	1
USA	6,169,000,000	7.685	2
Germany	5,012,000,000	6.244	3
Namibia	4,152,000,000	5.173	4
Botswana	4,127,000,000	5.142	5
Japan	3,995,000,000	4.977	6
UK	3,284,000,000	4.091	7
India	3,189,000,000	3.973	8
Mozambique	2,321,000,000	2.892	9
Belgium	2,307,000,000	2.875	10

Note: statistics at the annual-level based on the UN Comtrade database for 2015. Variables reported in levels. Total imports are expressed in US dollars. This reports the top 10 trading partners for South Africa for 2015.

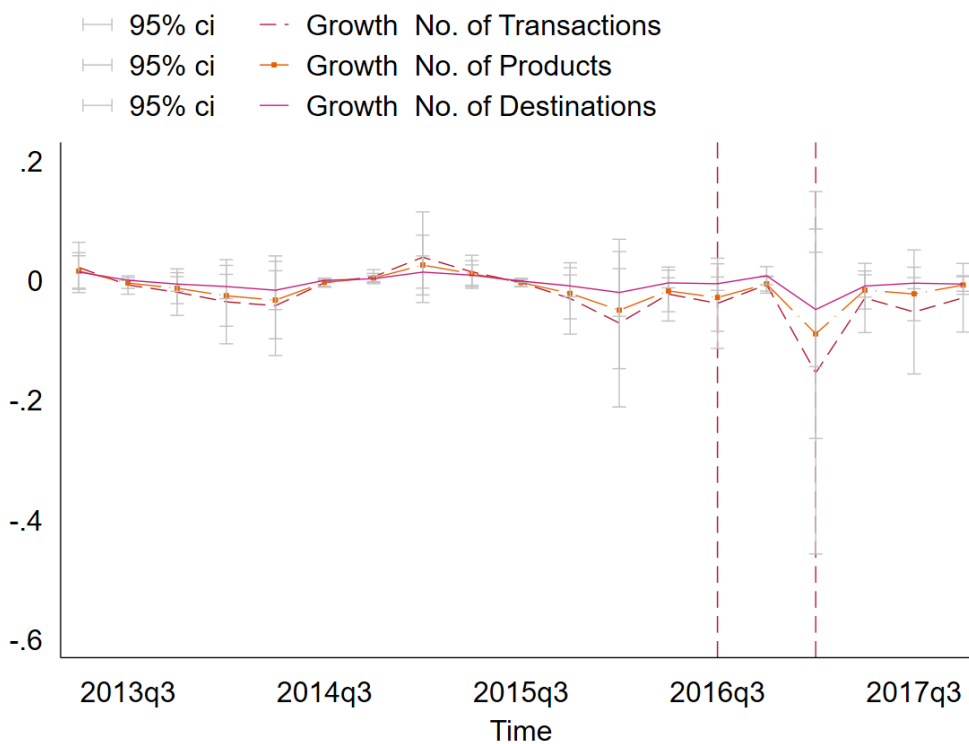
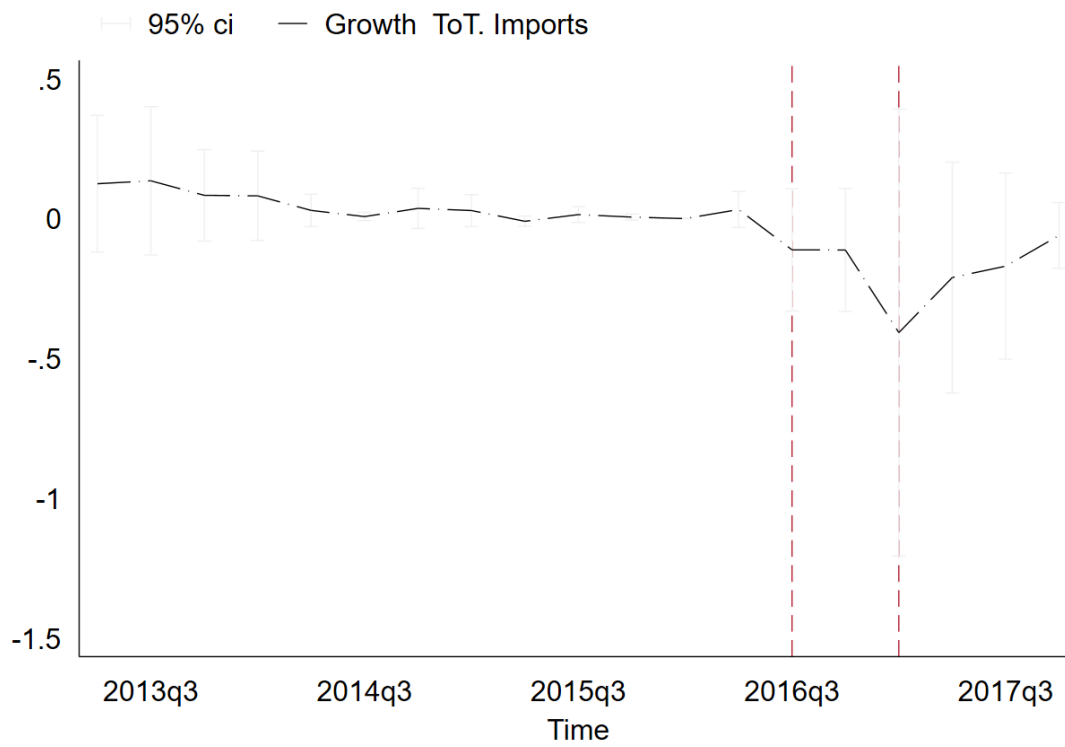
Source: author's compilation based on data from the UN Comtrade database.

Nevertheless, to identify whether this aggregate trend is driven by uncertainties within key global players (i.e. the trade war between the USA and China or the divorce between the UK and the EU) we analyse the growth of our main variables of interest with respect to those countries. Indeed, as Figure 2 shows, there has been a consistent fall in growth in import values and other trade margins following the Brexit referendum. In particular, although the trend with the USA and China has seen a similar pattern to the one with the UK, the former have since reversed, while the trend for the latter has remained consistently low. This suggests that the growing uncertainty between the EU and the UK has led to a reduction in imports from the UK, which has persisted throughout 2017.

Next, we investigate whether this pattern has been the same from the export perspective. As can be seen from Figure 3 for aggregate flows, both export values and trade transactions experienced a significant fall following the Brexit referendum. In a similar fashion to imports, the lowest dip coincided with the triggering of Article 50. A close look at the pattern with China, the USA, and the UK in Figure 4 reveals that this aggregate fluctuation is mainly driven by large deviations in trade with the UK in terms of both export values and overall transactions, whereas, contrary to the import patterns, the growth rate of exports towards China and the USA do not seem to be affected. This again highlights that the increasing uncertainties between the UK and the EU have led importers and exporters of the largest economy in Africa to drastically reduce their trade flows in an unclear trading environment due to uncertainty over future trade arrangements between the two blocs.

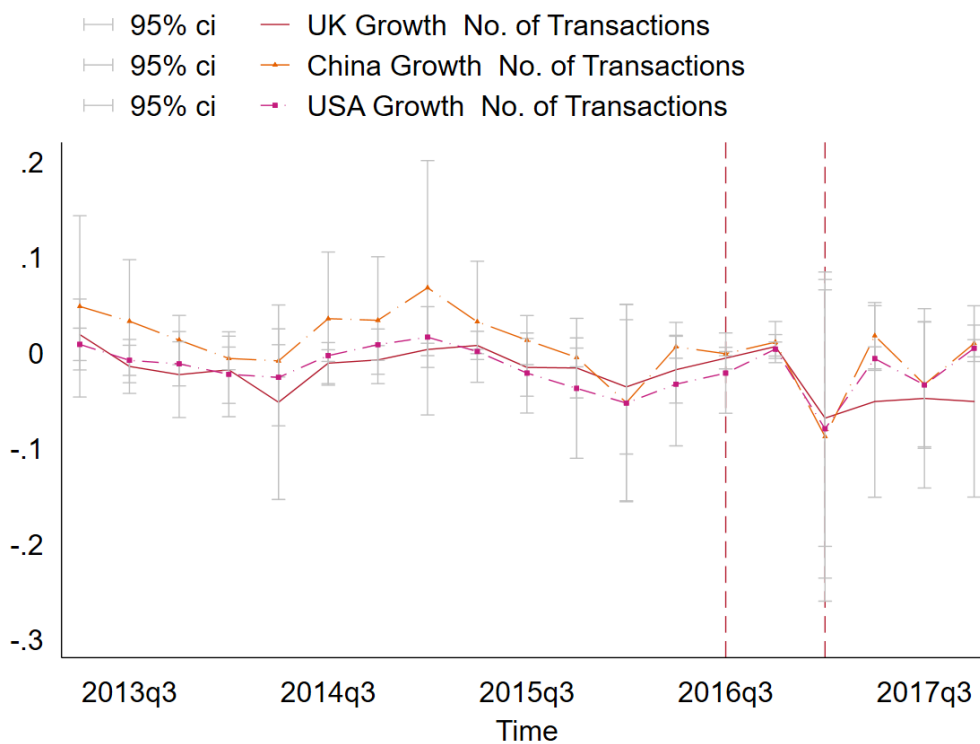
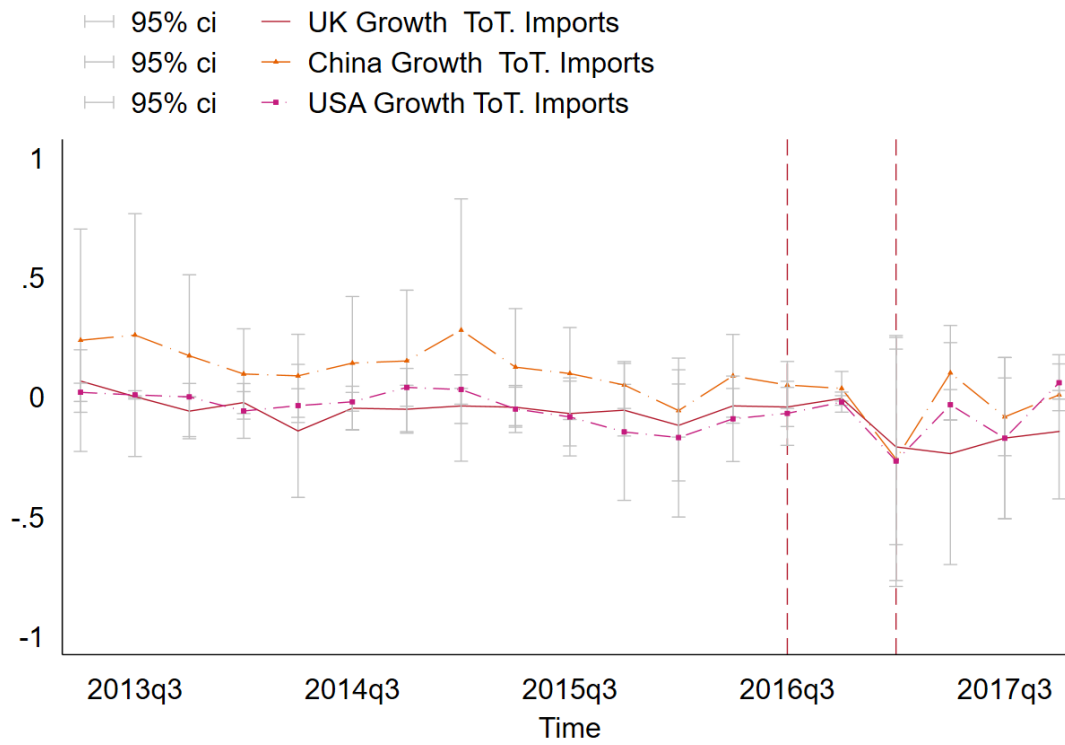
Furthermore, a closer look at the exposure of South Africa's traders to tariffs in Figure 5 reveals the potentially heterogeneous effect of uncertainties across firm sizes. In particular, among importers a large share of companies—about 60 per cent of product imported—follow in low tariff schedules across small, medium, and large companies. However, in terms of high-tariff products, it emerges that small companies import the highest share (about 30 per cent) compared to large firms (about 20 per cent). On the other hand, among exporters, large corporations tend to export products threatened by high tariffs at 11 per cent vs 7 per cent, respectively. While a large share of products face relatively low tariff threats, non-tariff barriers may still be significant.

Figure 1: Quarterly growth in import transactions



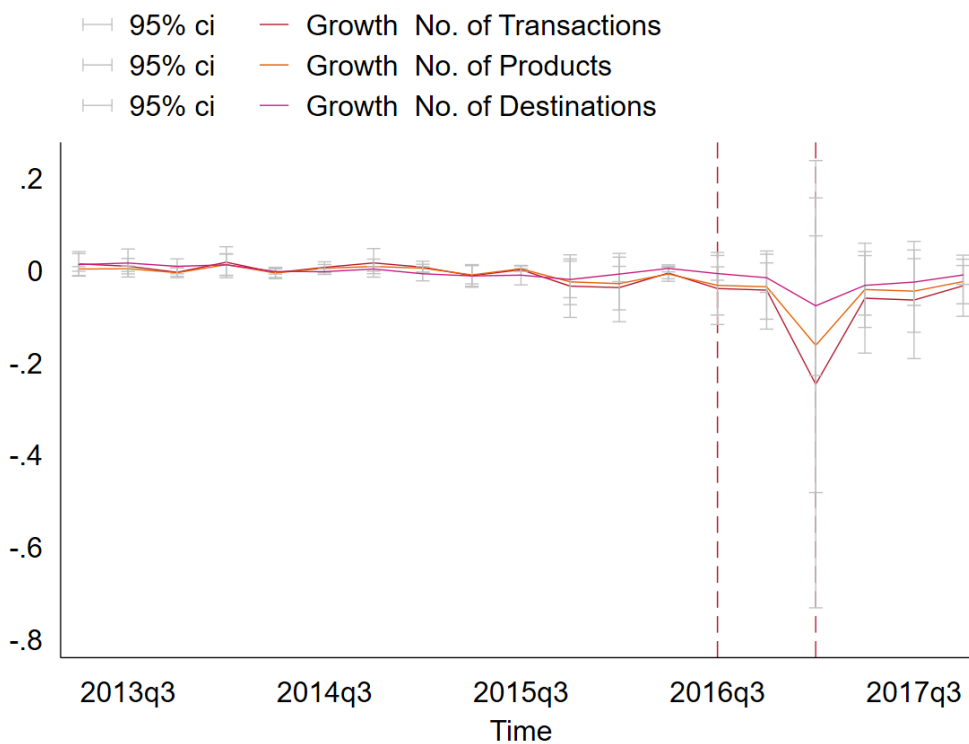
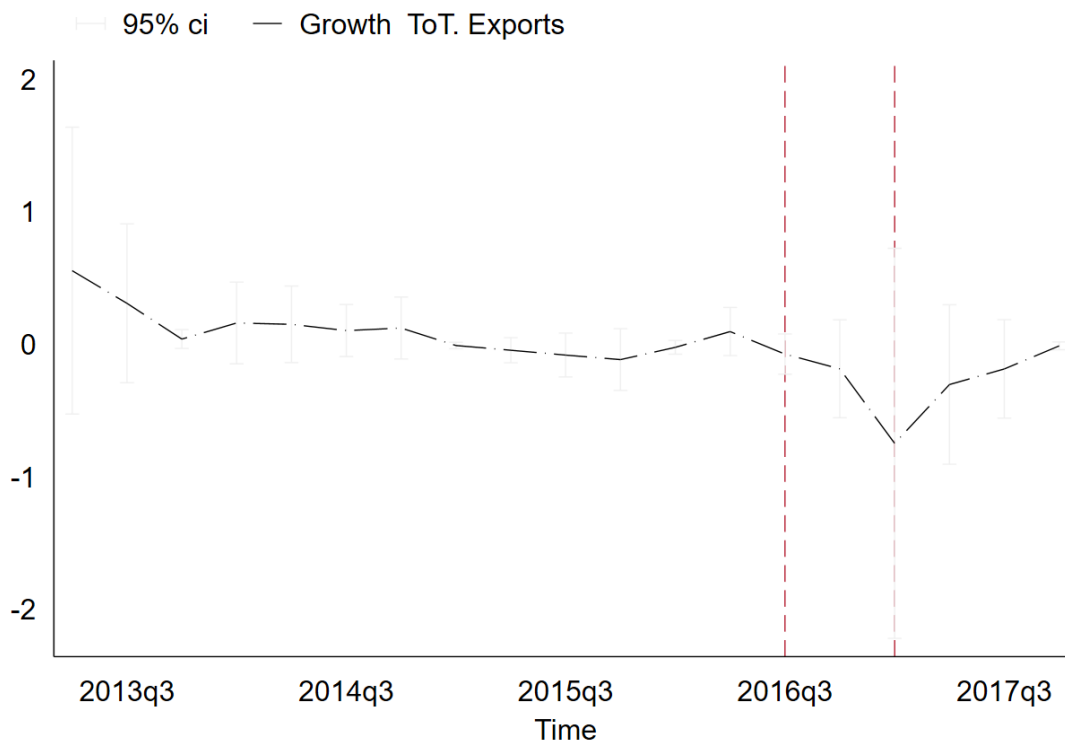
Source: author's compilation based on the South Africa Customs database, for the period 2012-Q1 to 2017-Q4.

Figure 2: Quarterly growth in import transactions with key trading partners (UK, China, USA)



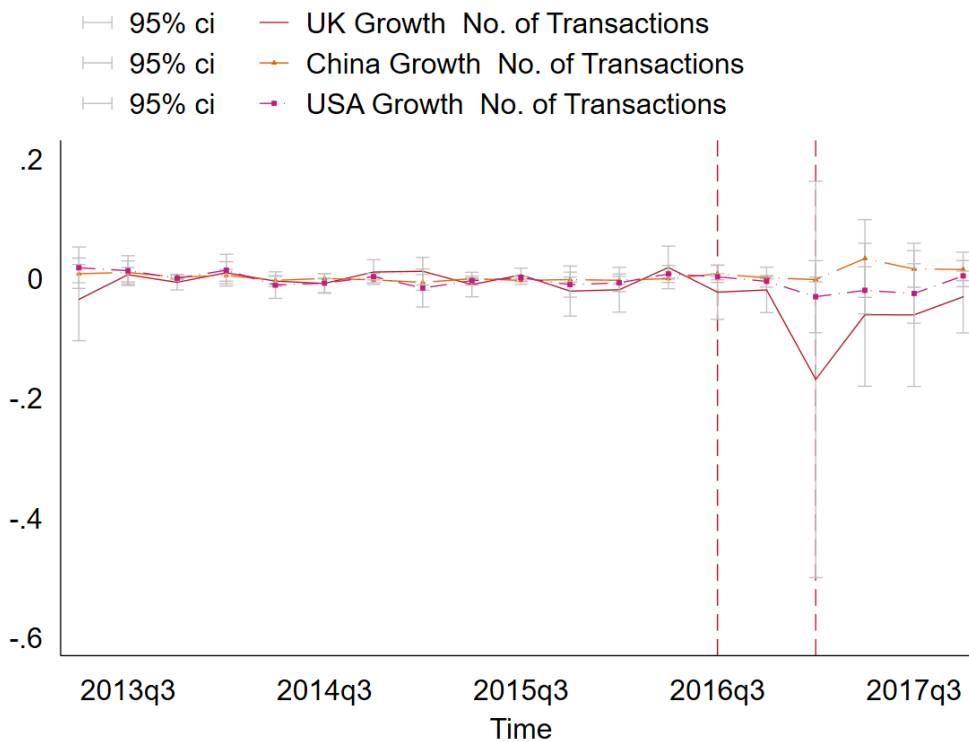
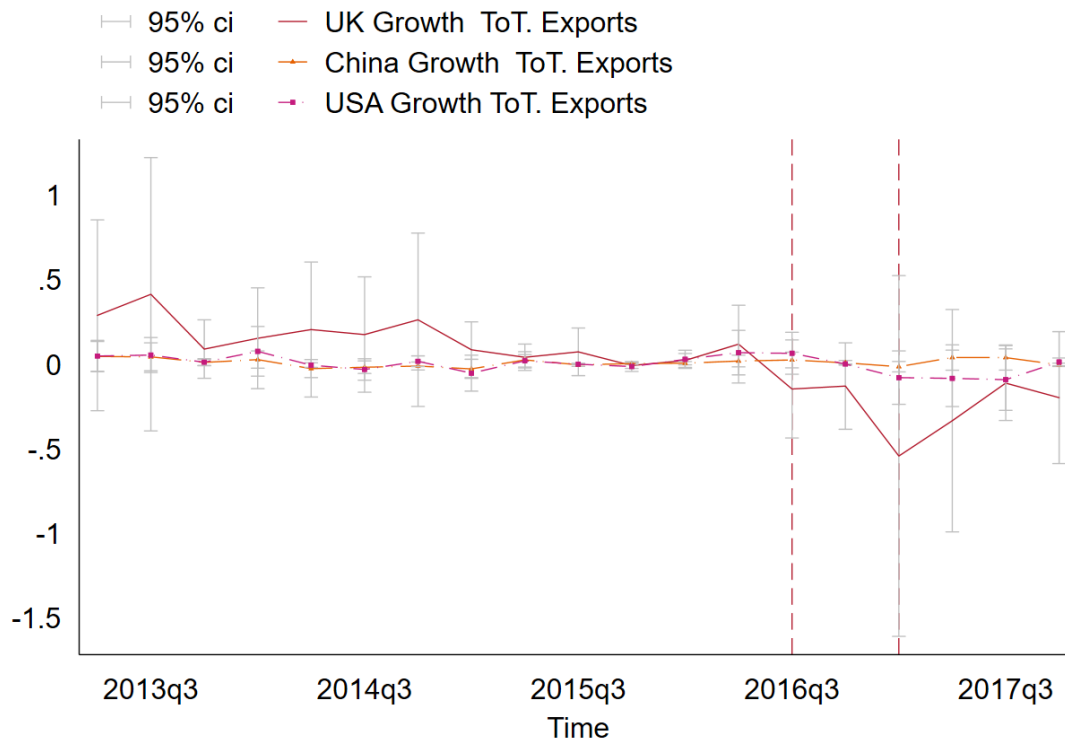
Source: author's compilation based on the South Africa Customs database, for the period 2012-Q1 to 2017-Q4.

Figure 3: Quarterly growth in export transactions



Source: author's compilation based on the South Africa Customs database, for the period 2012-Q1 to 2017-Q4.

Figure 4: Quarterly growth in export transactions with key trading partners (UK, China, USA)



Source: author's compilation based on the South Africa Customs database, for the period 2012-Q1 to 2017-Q4.

Figure 5: Tariff exposure across importers and exporters, 2015



Notes: the figure reports the breakdown of tariff exposure, based on exported (imported) products, by firm size using the South Africa Customs database, for the period 2015. The figure highlights that a large share of small importers face high tariff threats compared to exporters, where large companies dominate.

Source: author's compilation based on the South Africa Customs database.

What this analysis suggests is that increasing uncertainty among key trading partners has led South African traders to significantly reduce import and export flows. This is particularly significant in the case of the UK, highlighting that the increased tensions with the EU may have affected the export/import strategies of local businesses. Furthermore, given the heterogeneous exposure to tariffs across businesses, it is likely that the overall macroeconomic shock will have different implications according to firm size.

4 Methodology

The purpose of this paper is to identify a potential causal relationship between policy uncertainty surrounding the global economy—i.e. Brexit and the USA–China trade war—and uncertainties due to PTAs on the universe of exporting and importing populations for South Africa. In particular, we seek to determine whether trade margins have been affected and, if so, to what extent. For this we use a difference-in-differences (‘diff-in-diff’) approach that exploits the exogenous shock of the Brexit referendum as a natural field experiment and investigate its impact on developing economy perspectives.

Thus, we construct our main dependent variable, $\Delta \ln(y_{iq})$, as follows:

$$\Delta \ln(y_{iq}) = \ln(y_{iq}) - \ln(y_{iq-4}) \quad (1)$$

where, $\Delta \ln(y_{iq})$ represents the growth of either total exports (imports), number of transactions, number of products exported, number of destinations served, and the corresponding new flows by firm i in quarter q . This growth rate is referenced to $q - 4$; in other words, it relates to trade margins in the same period four quarters earlier. Furthermore, to account for potential exchange rate exposure we derive an average exchange rate, ex_{kq} , between the rand and currency k transaction, using the IMF’s monthly exchange rates. To account for an overall effective exposure of firm i to exchange rate, we then weight this by its share of trade that is denominated in currency k over the total exports (w_{ikq}) as a function of the number of overall currency transactions, N_{iq} , used in each quarter q :¹

$$\Delta(ER_{iq}) = \log\left(\frac{\sum_k w_{ikq} ex_{kq}}{N_{iq}}\right) - \log\left(\frac{\sum_k w_{icq-4} ex_{kq-4}}{N_{iq-4}}\right) \quad (2)$$

Thus, to test whether the Brexit referendum results or the South–South Agreement uncertainties have had an impact on South Africa’s trade, we specify the following equation:

$$\Delta \ln(y_{iq}) = \beta_0 + \beta_1 D + \beta_2 \ln(size_{iq-4}) + \beta_3 \ln(y_{iq-4}) + \beta_4 \Delta(ER_{iq}) + \varepsilon_i + \varepsilon_q + \varepsilon_{it} + \alpha_{iq} \quad (3)$$

where D is a Brexit dummy that is equal to 0 over the period 2012Q1–2016Q2 and 1 for the 2016Q3–2017Q4.² To account for potential size and productivity of exporter (importer), we include as the control firm i annual trading value in $q - 4$. We do this because large exporters tend to be very productive, export more products, and serve more destinations (Mayer and Ottaviano 2008). Furthermore, we account for exchange rate exposure as this might have important implications for trade margins. Indeed, fluctuations in exchange rate may impact both exporters and importers. On the one hand, appreciation may lead to cheap imports, but may result in domestic goods being more expensive to export. Thus, this may translate into affecting the living standard of the country. Thereby, we control for the change in the

¹ For importers, we derive a similar index, but it only considers the relative exposure to US dollars as we do not observe currency of invoice.

² Alternatively, it is equal to 1 for the Mercosur PTA, which entered into force in 2016Q4 between the Southern African Customs Union (SACU)—which is made up of South Africa, Namibia, Lesotho, Swaziland, and Botswana—and the Southern Common Market, which is a South American trade bloc comprising Argentina, Brazil, Paraguay, and Uruguay. The latter has the objective to eliminate or reduce tariffs on a certain number of products between the two trading blocs.

exposure of firm i to the exchange rate between q and $q - 4$. This allows us to disentangle any effect that might be due to exchange rate rather than to policy uncertainty. Moreover, to control for unobserved heterogeneous effects we include a battery of fixed effects. That is, we control for firm i , time, product, and product-trend fixed effects, namely ε_i , ε_q , ε_{ht} , respectively.³ This allows us to eliminate factors that are specific to product categories that are not observable by the researcher.

To capture whether policy uncertainty has had different implications along the distribution of exports, we modify Equation 3 to be a quartile regression as follows:

$$\Delta Q \ln(y_{iq}) = \beta_0 + \beta_1 D + \beta_2 \ln(\text{size}_{iq-4}) + \beta_3 \ln(y_{iq-4}) + \beta_4 \Delta(ER_{iq}) + \varepsilon_i + \varepsilon_q + \varepsilon_{ht} + \alpha_{iq} \quad (4)$$

where the quartile is expressed either in terms of key gravity model variables—that is, distance, GDP per capita, and population—or by tariff exposure.

5 Results

5.1 Baseline specification for importers: policy uncertainty surrounding Brexit

We analyse the effect of policy uncertainty on the complete sample of South African traders and exploit the exogenous outcome of the Brexit referendum to assess whether it has impacted Africa’s largest economy. In particular, we analyse how importers have reacted to increased uncertainties following the macroeconomic shock caused by the Brexit referendum and trade war between the USA and China. To this end we analyse the impact of post-Brexit uncertainties on import values, number of overall transactions, number of products imported, and the number of origins of imports (destinations). Moreover, we look at the total number of new transactions that each importer undertakes from one quarter to another—that is, new products imported and new import origins.

The results reported in Table 4 highlight a significant reduction of imports since the Brexit referendum. In particular, column (1) reports the overall effect on total import values. The results suggest a large decline in the growth of total imports of at least 70 per cent in aggregate, which suggests a shrinking of trading activity due to growing global uncertainties, whereas the effect of policy uncertainty on other trade margins (i.e. number of products exported and origins) suggests a consistent drop in the growth of these margins. This suggests that the number of products imported has driven the fall in overall transactions. Indeed, in aggregate policy, uncertainty had led to about a 60 per cent drop in the number of transactions. Nevertheless, in columns (5)–(7) we report the effect on new transactions undertaken by importers. The results highlight a significant decrease, especially in new countries or origins of imports, alongside a fall in new products imported in the country.

Table 4 shows a strong negative impact of the aftermath of the Brexit referendum on South Africa’s traders. The decline appears to be mainly driven by the reduction in overall products imported as well as by the fall in trading with new markets. An explanation for this may lay in the fact that tariff threats and unclear future trade relationships may discourage trade activity. Indeed, the slowdown may be driven by the fact that business expectations about future trade deals may play a significant role (Handley and Limão 2017b). Alternatively, businesses may reduce their trading activities in risky markets and seek other risk-free ones. These macroeconomic shocks have led to a considerable fall in the growth rate of trade values and other transaction margins. The drop in the number of destinations (origins) suggests that businesses may avoid undertaking search cost investments to establish new potential trading partners. In other words, these uncertainties may have led firms to withhold their investments, which in turn affects their productivity and potential innovation patterns, as well as their ability to engage in trade activity.

³ Where product fixed effect considers the product with highest share over firms’ total exports (imports).

These overall negative effects are consistent when including exchange rate movements and size, as well as controlling for unobserved factors.

Table 4: Effect of policy uncertainty on the trade margins of importers

Variables	(1) Total imports	(2) No. trans.	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Brexit referendum	-0.696*** (0.0923)	-1.174*** (0.0526)	-0.578*** (0.0335)	-0.370*** (0.0196)	-1.008*** (0.0175)	-1.478*** (0.0160)	-1.863*** (0.00423)
L. dep.var.	-0.960*** (0.00977)	-0.890*** (0.00582)	-0.922*** (0.00529)	-0.926*** (0.00363)	-0.999*** (0.00188)	-1.006*** (0.00162)	-1.030*** (0.000759)
L. exporter size	0.0759*** (0.00820)	0.0327*** (0.00513)	0.0310*** (0.00419)	0.0222*** (0.00197)	0.00470 (0.00428)	-0.00385 (0.00374)	-0.0112*** (0.00111)
Ex. rate exposure	-143.4*** (25.54)	-59.79* (29.02)	-158.6*** (31.26)	-1.616 (12.66)	47.26 (45.19)	50.28 (47.58)	-20.30 (23.57)
Constant	11.99*** (0.139)	2.665*** (0.0639)	1.871*** (0.0636)	1.301*** (0.0182)	1.864*** (0.0633)	2.213*** (0.0630)	2.145*** (0.0301)
Observations	410,092	410,092	410,092	410,092	410,092	410,092	410,092
R-squared	0.464	0.443	0.459	0.458	0.585	0.572	0.580
Number of id_trader	47,649	47,649	47,649	47,649	47,649	47,649	47,649
Time FE	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's importers. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment is the period 2016-Q3 to 2017-Q4. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

Heterogeneous effect by size

Table 4 suggests that in aggregate the effect of policy uncertainty on importers has been significant and consistent across both import values and other trade margins. Nevertheless, it may be that there exist heterogeneous responses across businesses of different size. Indeed, large firms tend to be financially solid and able to overcome long periods of weak demand, as well as have solid links with foreign markets. However, small and medium-size companies may be more vulnerable to external shocks. Thus, they may be more keen to postpone investments and have weak productivity, which may lead to fewer trading connections following increasing uncertainties (Bloom 2009, 2014).

To this end, we breakdown the overall impact of Brexit uncertainty (and that of a potential trade war) by firm size and distinguish between small, medium and large firms.⁴ Table 5 reports the results of this alternative specification. What this suggests is that among different importers, small firms have been the ones that mostly suffered from global uncertainties. Indeed, the overall effect on the imports value show a drop in the growth of import values of about 44 per cent, whereas, medium and large firms show increases of about 13 and 29 per cent, respectively. Similarly, the results for the overall number of products imported and countries of origin show a similar pattern. That is, small businesses imported fewer products and from fewer destinations. However, the pattern is positive and statistically significant for medium and large firms.

⁴ Here, we define small, medium, and large according to the annual distribution of exports. In particular, we define small firms as those below the median of annual imports distribution, medium as those below the 75th percentile, and large firms as those above this threshold.

Table 5: Heterogeneous effect of policy uncertainty on the trade margins of importers

Variables	(1) Total imports	(2) No. transactions	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Small size	-0.441*** (0.0491)	-0.0130 (0.0132)	-0.0222** (0.00930)	-0.0134** (0.00562)	0.00575 (0.0121)	0.0266** (0.0108)	0.0182*** (0.00228)
Medium size	0.133** (0.0487)	0.127*** (0.0156)	0.0947*** (0.0131)	0.0431*** (0.00736)	0.0704*** (0.0142)	0.0720*** (0.0117)	0.0248*** (0.00299)
Large size	0.286*** (0.0452)	0.222*** (0.0134)	0.161*** (0.0129)	0.0917*** (0.00738)	0.116*** (0.0137)	0.0831*** (0.0103)	0.00706** (0.00224)
Observations	410,092	410,092	410,092	410,092	410,092	410,092	410,092
R-squared	0.470	0.446	0.462	0.460	0.585	0.572	0.580
Number of importers	47,649	47,649	47,649	47,649	47,649	47,649	47,649
Control variables	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's importers, and we break down this effect by firm size. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment is the period 2016-Q3 to 2017-Q4. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

This suggests that policy uncertainty has major negative effects in particular for small firms. This supports evidence that highlights that also for developed countries policy uncertainty has strong negative effects on micro and small traders (Douch et al. 2019). This confirms similar findings for developing economies. One explanation for this may be the fact that small businesses tend to be more vulnerable to external macroeconomic shocks due to their financial constraints. Indeed, financial constraints tend to be more prominent for younger and smaller firms, but also new entrants tend to suffer from resource constraints (Carreira and Silva 2010). This, in turn, has an impact on firm ability to survive and undertake long-term investments, which affect firms' ability to grow and enhance long-term productivity.

Imports tariff exposure

What we have assumed so far is that the impact of policy uncertainty is the same across products of different tariff exposures. However, it is likely that low-tariff products may face different level of macroeconomic uncertainty compared to high-tariff threat products. To this end, we investigate whether this may be the case and whether there has been a heterogeneous response in this dimension. Figure 6 reports the result by breaking down the effect by import value, number of products, and destinations (origins) across three groups of product tariff exposures: low, medium, and high. What emerges from this alternative specification is that there has been a decline across all groups of the distribution. However, the effect is not homogeneous; rather, there are substantial differences across alternative specifications. In particular, import values have seen a large decline for products with medium-high tariff threat products, and the number of products imported with the highest decline are from low- and high-tariff exposure goods. Similarly, the decline in the number of origins is mainly from countries with products that face either low or high tariff threats.

This provides an interesting alternative viewpoint that highlights potential heterogeneous effects of macroeconomic shocks across the distribution of tariff threats. In other words, businesses may be reacting to tariff threats depending on the kind of products they export. What Figure 5 shows is that small importers trade the largest share of high-tariff products. This then results in a high negative impact of policy uncertainty in particular for small firms. This sensitivity highlights that tariff threats are a

substantial driver of a fall in the overall import activity of this group of firms. Nevertheless, it also provides potential evidence of policy relevance, suggesting that small businesses that are more exposed to potential tariff threats should be targeted with policies aimed at reducing the effects of potential macroeconomic shocks.

Figure 6: Effect by tariff exposure for imports



This figure provides a breakdown by three groups of tariff exposures for total imports, number of products, and number of destinations. A 95 per cent confidence interval is reported for each variable. Q1 represents below the mean value, Q2 is 50th to 75th percentile, and Q3 is the last 25th percentile

Source: author's compilation based on South Africa Customs data.

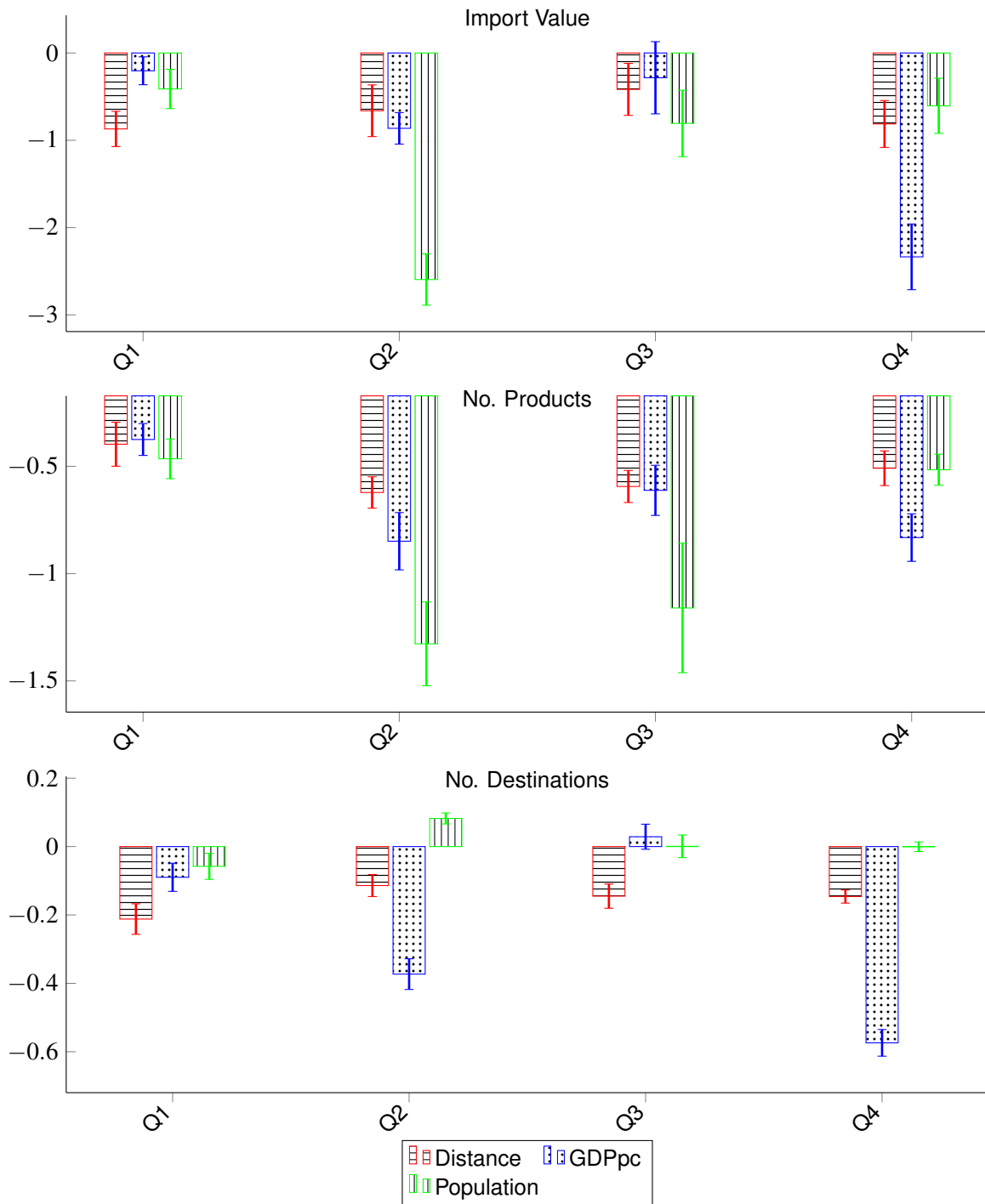
Importers and gravity

We now turn to the analysis of the effects of macroeconomic shocks from policy uncertainty across the distribution of trading partners in terms of gravity variables, namely by dividing countries by distance, GDP per capita, and population size. This allow us to investigate whether the fall has been homogeneous across different economies—that is, whether this effect is more severe for close-by or far-away countries, or heterogeneous across destinations. It also give us an idea on how these effects are distributed across countries of different characteristics.

Figure 7 shows how imports have declined across all specifications and across all trading partners. However, the magnitude is relatively heterogeneous. Indeed, what this suggests is that the large fall in import values is mainly driven by trading partners with relatively high GDP per capita—so relatively rich countries—but also with a medium-sized population. Nevertheless, when looking at the number of products imported we see that the decline is generally coming from the middle-to-high end of the distribution of trading partners both in terms of distance and GDP per capita, whereas in terms of destinations (origins) of imports there is a clear fall from far-away and rich countries.

This suggests that uncertainties in rich countries can have a knock-on effect on the trade patterns of third countries. This is possibly due to the fact that global value chain linkages may play a role in this phenomenon. In fact, despite uncertainties arising between the USA and China or between the UK and the EU, these may still have large impacts on far-away supply chains. The biggest impact on imports is mainly driven by rich and middle-sized partners (i.e. in terms of population), but also those far from South Africa. Moreover, a rise in uncertainties is likely to undermine current investments as well as durables consumption and aggregate output (Elder and Serletis 2010). This policy uncertainty may also have potential implications for firms' product churning as firms react to globalization shocks (Bernard et al. 2011; Eckel and Neary 2010; Iacovone and Javorcik 2010; Nocke and Yeaple 2014).

Figure 7: Importers: gravity effect



Notes: this figure provides a breakdown by gravity variable distribution of the effect of the Brexit shock on import value, number of products, and number of destinations (origins). A 95 per cent confidence interval is reported for all importer types.

Source: author's compilation based on South Africa Customs data.

5.2 Baseline specification for exporters

Policy uncertainty may affect exporters in similar ways to importers. However, the magnitude and direction of trade may well be such that there are heterogeneous responses to macroeconomic shocks. This is because, on average, the latter may import relatively more products from fewer countries than what exporters export to many destinations (Manova and Zhang 2009).

Thus, to investigate the overall effects on exporters, we report in Table 6 the corresponding results. What this table suggests is that on aggregate total export values have seen a relative increase compared to the pre-Brexit period, whereas on aggregate there is no effect on the number of products exported nor on the destinations served. The only effect that emerges is on new transactions undertaken by traders. That is, both new products and new destinations saw a negative fall in the aftermath of the macroeconomic shock that caused increasing global uncertainties. This suggests that although exporters may have been able to reduce the potential impact of uncertainties, there has been a net negative effect on new transactions. Indeed, the results highlight a fall of about 19 per cent in the growth of new products and new destinations served.

Table 6: Effect of policy uncertainty on the trade margins of exporters

Variables	(1) Tot. exports	(2) No. trans.	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Brexit referendum	0.400** (0.153)	-0.0406 (0.0414)	0.0240 (0.0423)	0.00156 (0.00615)	-0.256*** (0.0377)	-0.190** (0.0772)	-0.196*** (0.0281)
Observations	355,072	355,072	355,072	355,072	355,072	355,072	355,072
R-squared	0.535	0.445	0.465	0.448	0.592	0.580	0.574
Number of exporters	40,340	40,340	40,340	40,340	40,340	40,340	40,340
Control variables	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y
Product-Trend	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's exporters. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment period is 2016-Q3 to 2017-Q4. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

Contrary to importers, where uncertainties have led to a fall across all specifications, for exporters these results emphasize that only new transactions have suffered from these macroeconomic shocks. A potential explanation for this may lay in the fact that, on aggregate, large corporations may dominate this effect. In other words, a few large businesses might have high export volumes compared to a large number of importers that trade relatively less. Generally, large firms tend to be more productive as well as more financially stable, and to have strong international links through subsidiaries and other partnerships.

Heterogeneous effects by size

Table 6 suggests that on aggregate the effect of policy uncertainties on exporters is relatively less strong than that on importers. However, breaking down this effect by firm size reveals interesting similarities with importing firms. That is, there exists heterogeneous effects across firms. Indeed, as Table 7 shows, across all specifications medium and small firms have seen a large drop in trade margins. In particular, small businesses show a stronger drop in their growth rates compared to other firms. For instance, in terms of overall transactions there is a reduction of about 25 per cent of total transactions and about 36 per cent in the growth rate of new transactions. Large firms show a positive growth across most specifications, but new transactions. One explanation for this may be that existing trading routes may have well-established links (i.e. in terms of global value chain linkages), but establishing new routes requires more sunk cost investment, which firms may decide to postpone during uncertain periods.

Table 7: Heterogeneous effect of policy uncertainty on the trade margins of exporters

Variables	(1) Tot. exports	(2) No. trans.	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Small exporters	-1.162*** (0.135)	-0.247*** (0.0405)	-0.144*** (0.0415)	-0.0619*** (0.00763)	-0.358*** (0.0361)	-0.246*** (0.0727)	-0.173*** (0.0265)
Medium exporters	0.317** (0.107)	-0.110** (0.0365)	-0.0302 (0.0377)	-0.0235*** (0.00698)	-0.297*** (0.0371)	-0.203** (0.0741)	-0.179*** (0.0257)
Large exporters	0.554*** (0.0680)	0.00305 (0.0281)	0.0582* (0.0300)	0.0165* (0.00750)	-0.231*** (0.0301)	-0.180** (0.0737)	-0.205*** (0.0264)
Observations	355,072	355,072	355,072	355,072	355,072	355,072	355,072
R-squared	0.540	0.448	0.468	0.450	0.593	0.580	0.574
Number of exporters	40,340	40,340	40,340	40,340	40,340	40,340	40,340
Control variables	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y
Product-Trend	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's exporters, and we breakdown this effect by firm size. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment period is 2016-Q3 to 2017-Q4. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

This reiterates the fact that policy uncertainties have a strong negative impact on small businesses compared to large firms (Douch et al. 2019). These heterogeneities have important implications for policy as it shows that macroeconomic shocks do not affect firms in a similar fashion; rather, they highlight small businesses as key economic agents that are more vulnerable. A factor behind this may be in terms of financial factors, both internal and external, that may affect firms' productivity and investment decisions. Indeed, large companies may have established strong relations with financial institutions compared to small, young firms, which allow them to be less financially constrained. Moreover, financial institution development may also play a role in mitigating these effects (Beck and Demircuc-Kunt 2006).

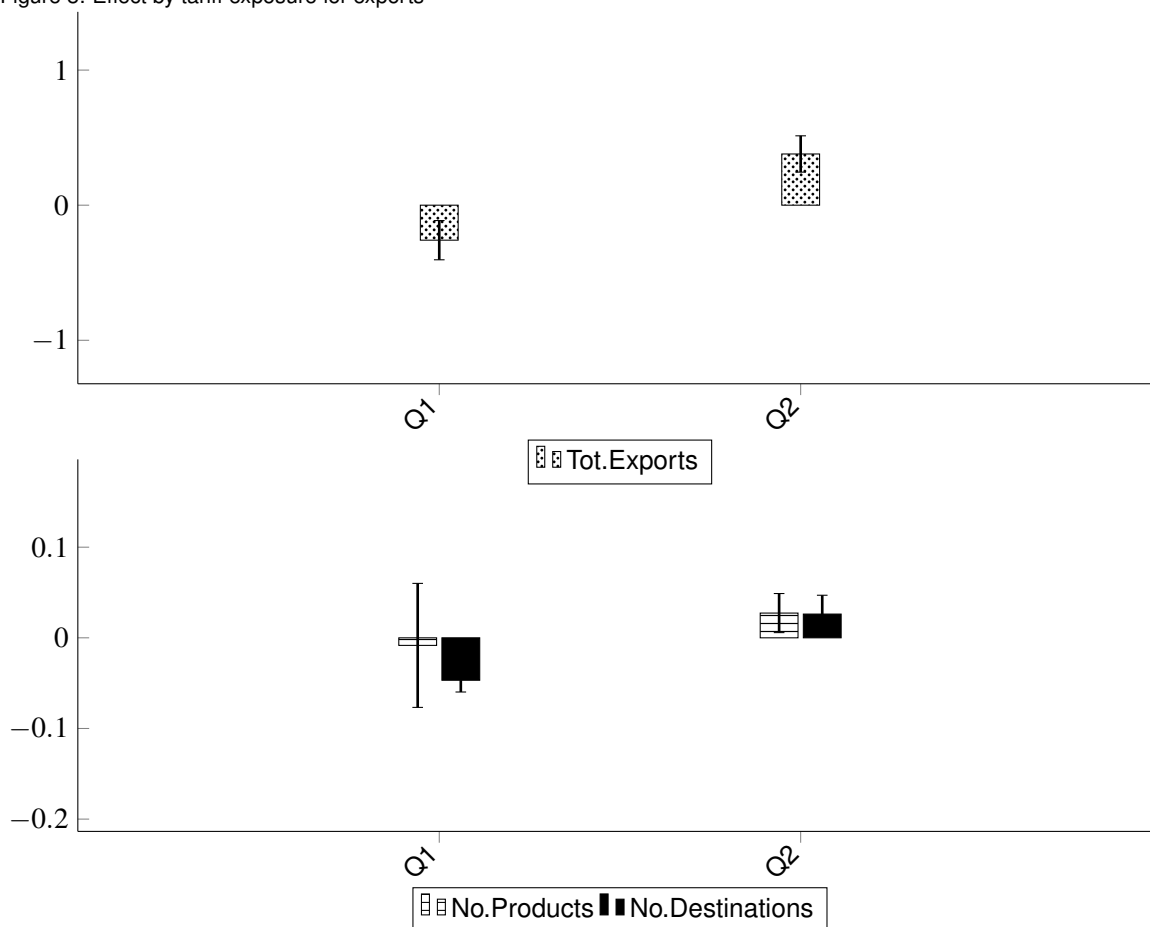
Export tariff exposure

Another heterogeneous aspect of this analysis is to investigate whether the impact of this policy uncertainty has affected all products that may face different tariff exposures in a similar manner. In fact, low tariff exposure products may react differently to these shocks compared to high-tariff products because of differences in the types of materials these goods comprise (e.g. agricultural versus manufacturing products). However, global value chain linkages may also play a role in how different products respond to increased global uncertainties.

Figure 8 shows the impact across businesses of different product tariff exposures of their exports. We analyse and distinguish low- and high-tariff products.⁵ What emerges overall is that the effect has been heterogeneous across products. In fact, the results highlight a negative effect on low tariff exposure products and a positive effect on high-tariff products. Similarly, there has been an increase in the number of destinations where products face high tariffs. This may be due to the fact that most small companies generally export low-tariff products while large companies export a large share of high-tariff products (Figure 5).

⁵ This is due to the large number of zero-tariff products, thus we distinguish products below the mean and above-average tariffs.

Figure 8: Effect by tariff exposure for exports



Notes: this figure provides a breakdown into two groups of tariff exposures for total exports, number of products, and number of destinations. A 95 per cent confidence interval is reported for each destination market.

Source: author's compilation based on data from the South Africa Customs database.

This shows that tariff exposure as well as firm size are important elements to understand how businesses respond to policy uncertainties. On one hand, increased uncertainty is equivalent to increases in tariffs (Handley and Limão 2017b), thus businesses may face higher likelihood of exiting the export market (Crowley et al. 2018). This, however, may be more severe for small and potentially more financially constrained firms.

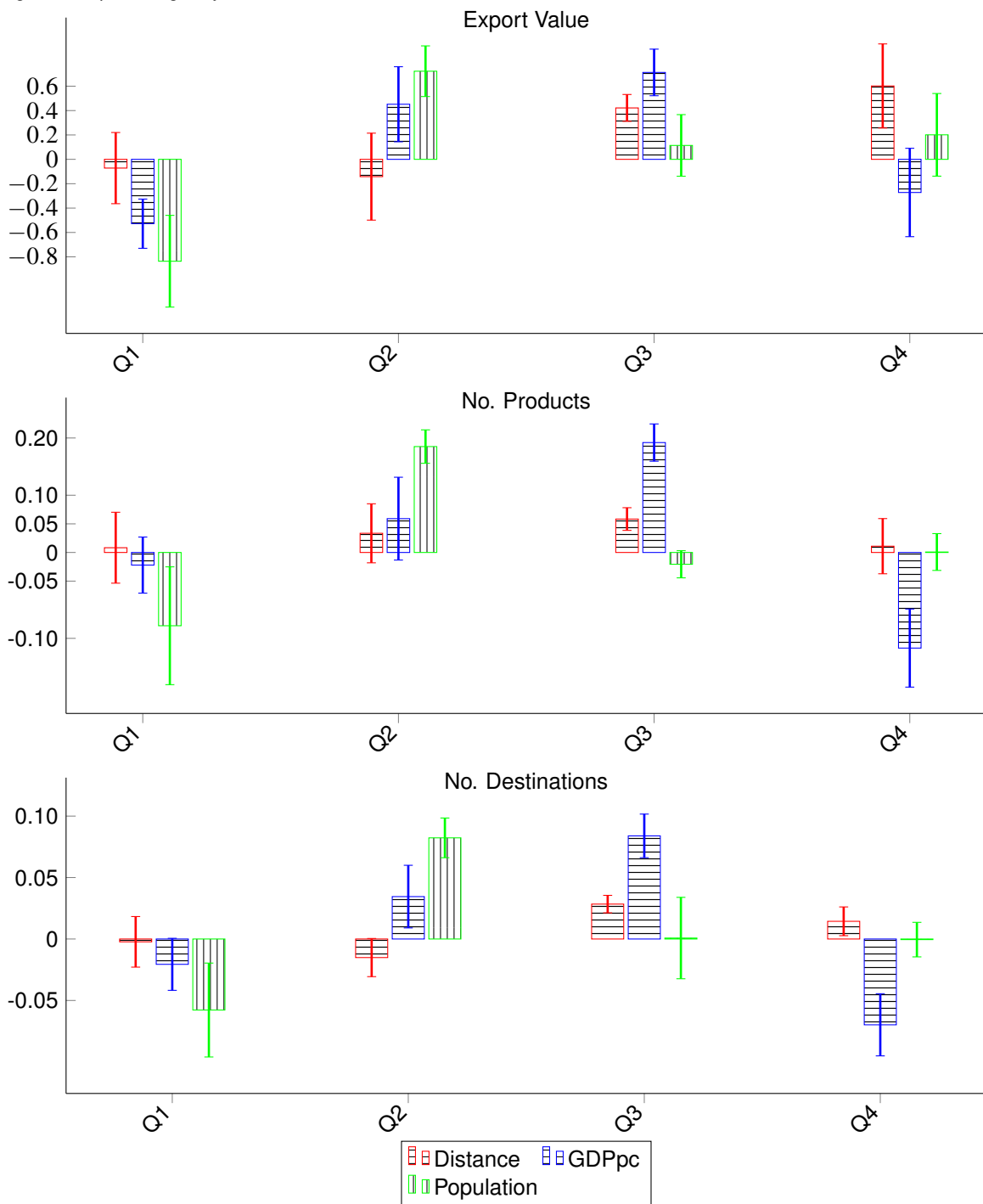
Exporters and gravity

We look at the possibility that these macroeconomic shocks may have driven exporters to divert exports towards less risky markets. To this end, based on the distribution of trading partners, we analyse the effect by different groups. That is, we look across distance, GDP per capita, and population size. The results of this alternative specification, reported in Figure 9, highlight substantial and consistent results for exports value and for transaction variables (i.e. number of products exported and number of destinations served).

What this shows is that exporters have seen a significant fall from trading partners that are generally far away or very close by, whereas they have experienced a positive outcome from trading partners in the middle of the distribution. In other words, export flows with middle-income countries have experienced positive growth compared to those with rich countries. This is consistent when we look at export values but also across the overall number of products exported and in terms of destinations served. This is because there has been relatively high uncertainty levels in recent years among rich countries, which

may have affected trade patterns with other countries. In fact, global value chain linkages may work as transmission channels of these risks, which may lead to negative impacts on aggregate trade, hence on businesses activity.

Figure 9: Exporters: gravity effect



Notes: this figure provides a breakdown by gravity variable distribution of the effect of the Brexit shock on export values, number of products, and number of destinations served. A 95 per cent confidence interval is reported for all exporter types.

Source: author's compilation based on data from the South Africa Customs database.

5.3 Robustness checks

To investigate the robustness of our previous results, we test a number of alternative specification to validate the consistency of these outcomes. This includes falsification exercises as well as looking at alternative ways of analysing uncertainties, and breakdown of the results.

To this end, we first consider whether the observed negative impact is still statistically significant when we account for a longer growth rate. That is, we derive a two-year diff-in-diff approach that considers a comparison of post-Brexit vote outcomes to the values observed in the same quarter two years earlier. This eliminates potential effects that might be caused by potential anticipatory effects within a year before the vote. In other words, businesses may have already started anticipating potential increased uncertainties during the months before the referendum, which might have an impact on the exogeneity of the comparison group. Thus, by comparing the post-referendum period to the period two years before the referendum we are less likely to face this problem. The results of this specification for importers of different sizes is reported in Table 8. What emerges from this alternative specification is that despite long-term growth rate consideration there has been a consistent fall in import values, number of products imported, and the number of originating countries with which importers have traded. In particular, this is the case for small businesses, but medium and large companies show a positive growth since the Brexit referendum. This confirms that policy uncertainties have strong negative impacts on small firms rather than large corporations.

Table 8: Heterogeneous effect of policy uncertainty on the trade margins of importers, two-year lag diff-in-diff

Variables	(1) Tot. imports	(2) No. trans.	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Small exporters	-0.468*** (0.0390)	-0.0189 (0.0130)	-0.0260** (0.00951)	-0.0175** (0.00600)	0.0174 (0.00996)	0.0242** (0.00784)	0.0150*** (0.00184)
Medium exporters	0.122** (0.0375)	0.129*** (0.0183)	0.0968*** (0.0159)	0.0436*** (0.00889)	0.0826*** (0.0180)	0.0695*** (0.0144)	0.0195*** (0.00152)
Large exporters	0.260*** (0.0310)	0.223*** (0.0148)	0.162*** (0.0141)	0.0904*** (0.00742)	0.136*** (0.0136)	0.0963*** (0.0101)	0.0125*** (0.00275)
Observations	292,364	292,364	292,364	292,364	292,364	292,364	292,364
R-squared	0.497	0.496	0.503	0.502	0.616	0.601	0.617
Number of id_trader	40,557	40,557	40,557	40,557	40,557	40,557	40,557
Control variables	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y
Product-Trend	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's importers by size. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), as well as new transactions. Here, the treatment period is 2016-Q3 to 2017-Q4. The diff-in-diff approach takes into consideration a comparison group from two years earlier. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

Similarly, the results for exporters in Table 9 show an analogous pattern to that for importers. However, in contrast, both small and medium companies have experienced a fall post-Brexit referendum when we compare values to those from two years earlier. This confirms that policy uncertainty has significantly impacted firms, in particular small and medium companies.

Another view is to look at the effect of triggering Article 50, which also coincides with the start of increasing trade uncertainties between the USA and China, rather than the Brexit referendum outcome. In this regard, Table 10 show a consistent drop and statistically significant fall across different specifications, but also with a higher magnitude. Similar results are also derived for importers. We also combine

both Brexit referendum and Article 50 dummies in the same model, but the results highlight a consistent fall for importers and exporters. In particular, the significant fall is consist across small firms.

Table 9: Heterogeneous effect of policy uncertainty on the trade margins of exporters, two-year lag diff-in-diff

Variables	(1) Tot. exports	(2) No. trans.	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Small exporters	-1.110*** (0.149)	-0.245*** (0.0399)	-0.149*** (0.0453)	-0.0763*** (0.00645)	-0.195*** (0.0462)	-0.121 (0.0740)	-0.102*** (0.0198)
Medium exporters	0.312** (0.116)	-0.107** (0.0360)	-0.0351 (0.0422)	-0.0373*** (0.00543)	-0.138** (0.0460)	-0.0820 (0.0777)	-0.105*** (0.0195)
Large exporters	0.517*** (0.0772)	-0.000244 (0.0248)	0.0473 (0.0329)	0.000369 (0.00701)	-0.0692* (0.0372)	-0.0505 (0.0751)	-0.116*** (0.0202)
Observations	254,892	254,892	254,892	254,892	254,892	254,892	254,892
R-squared	0.579	0.510	0.522	0.506	0.632	0.618	0.622
Number of exporters	34,590	34,590	34,590	34,590	34,590	34,590	34,590
Control variables	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's exporters by size. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment period is 2016-Q3 to 2017-Q4. The diff-in-diff approach takes into consideration a comparison group from two years earlier. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

Table 10: Effect of policy uncertainty on the trade margins of exporters: trigger of Article 50

Variables	(1) Tot. exports	(2) No. trans.	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Trigger Art. 50	-0.662*** (0.0737)	-0.260*** (0.0310)	-0.185*** (0.0178)	-0.0760*** (0.0105)	-0.170*** (0.0242)	-0.104*** (0.0147)	0.00378 (0.00922)
Number of id_trader	40,340	40,340	40,340	40,340	40,340	40,340	40,340
R-squared	0.535	0.445	0.465	0.448	0.592	0.580	0.574
Number of id_trader	40,340	40,340	40,340	40,340	40,340	40,340	40,340
Control variables	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y
Product-Trend	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's exporters. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment period is 2017-Q1 to 2017-Q4. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

To validate the above results we also run a falsification test (Acemoglu et al. 2016), which sets randomly the Brexit referendum outcome to two years earlier. The results are reported in Tables 11 and 12. What emerges from this specification is that for both exporters and importers we obtained an opposite effect. For instance, the outcome for importers is that the effect of fake policy shock has actually led to a positive growth in all specifications, thus validating the identification strategy used here. For exporters this shows a negative outcome, while in the main specification it was not statistically significant. Note that the breakdown by size does show a general positive trend across firms.

Table 11: Placebo in time for exports

Variables	(1)	(2)	(3)	(4)
	Tot. exports	No. transactions	No. products	No. destinations
Brexit referendum	-0.230 (0.196)	-0.264*** (0.0652)	-0.138** (0.0525)	-0.0716*** (0.0147)
Observations	355,072	355,072	355,072	355,072
R-squared	0.534	0.439	0.462	0.446
Number of exporters	40,340	40,340	40,340	40,340
Control variables	Y	Y	Y	Y
Time FE	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y
Product FE	Y	Y	Y	Y
Product-Trend	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's exporters. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment is chosen randomly and it is the period 2014-Q1 to 2017-Q4. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

Table 12: Placebo in time for imports

Variables	(1)	(2)	(3)	(4)
	Tot. imports	No. transactions	No. products	No. destinations
Brexit referendum	0.1000*** (0.0163)	0.0988*** (0.00645)	0.0735*** (0.00521)	0.0349*** (0.00386)
Observations	410,092	410,092	410,092	410,092
R-squared	0.464	0.443	0.459	0.458
Number of importers	47,649	47,649	47,649	47,649
Control variables	Y	Y	Y	Y
Time FE	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y
Product FE	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's importers. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment is chosen randomly and it is the period 2014-Q1 to 2017-Q4. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

Furthermore, we investigate whether these trade flows, in particular exports, have suffered similar falls since the Brexit referendum from other countries or specific agglomerations of countries. To this end, in Table 13 we report the results by firm size of the resulting effect of increased uncertainty. What emerges from this alternative specification is that there has been a negative effect especially across small firms in their growth rates with respect to Southeast Asia, Africa—in particular across SACU—and the Southern African Development Community (SADC), and from the UK and Japan. However, in terms of overall transactions, the results highlight a statistically significant negative effect also from OECD and EU countries (although only at the 10 per cent level). However, small businesses have experienced strong negative effects from SADC, SACU, and the UK since the Brexit referendum.

Table 13: Brexit uncertainty by size and aggregate destination of exports

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	OECD	EU	Central Asia	Middle East	South Asia	Southeast Asia	Oceania	Africa	North America	Central America	South America	SACU	SADC	AEC	UK	USA	Japan	Korea	China	India	Australia	Canada
Panel A:																						
Export value																						
Small firms	-0.216 (0.129)	-0.152 (0.0853)	-0.161 (0.0899)	-0.103 (0.112)	0.114 (0.0938)	-0.188* (0.0884)	-0.137 (0.0835)	-1.282*** (0.135)	0.00256 (0.131)	0.0671 (0.0377)	0.126 (0.0825)	-0.850*** (0.0962)	-1.370*** (0.129)	0.0339 (0.0937)	-0.472** (0.174)	-0.0192 (0.134)	-0.121** (0.0387)	-0.0546 (0.0416)	0.0625 (0.0835)	0.0841 (0.0493)	-0.0508 (0.0774)	0.0724 (0.0440)
Medium firms	-0.0753 (0.106)	-0.0140 (0.105)	-0.167 (0.0940)	-0.0703 (0.123)	0.115 (0.0838)	-0.152* (0.0798)	-0.0976 (0.0825)	-0.0261 (0.0864)	0.0744 (0.109)	0.0758** (0.0335)	0.0938 (0.0713)	-0.0470 (0.104)	-0.133 (0.114)	0.0402 (0.0990)	-0.145 (0.196)	0.0368 (0.120)	-0.114*** (0.0317)	-0.0658 (0.0450)	0.0703 (0.0782)	0.0736* (0.0389)	-0.0304 (0.0780)	0.0585 (0.0421)
Large firms	0.0597 (0.0755)	0.168* (0.0767)	-0.115 (0.0949)	0.0529 (0.106)	0.185* (0.0869)	0.0125 (0.0773)	-0.0249 (0.0721)	0.270*** (0.0524)	0.199* (0.0938)	0.121** (0.0516)	0.125 (0.0822)	0.0382 (0.0667)	0.102 (0.0940)	0.286** (0.110)	0.0375 (0.178)	0.152 (0.109)	-0.0902** (0.0367)	-0.00526 (0.0232)	0.165* (0.0771)	0.111** (0.0381)	0.0123 (0.0821)	0.0918* (0.0446)
R-squared	0.477	0.479	0.442	0.470	0.476	0.476	0.482	0.528	0.475	0.448	0.485	0.538	0.529	0.490	0.489	0.476	0.441	0.453	0.463	0.475	0.486	0.458
Panel B:																						
No. products																						
Small firms	-0.0269 (0.0151)	-0.0230* (0.0107)	-0.00922 (0.00722)	-0.00803 (0.0134)	0.0135* (0.00703)	-0.0328** (0.0119)	0.000171 (0.00819)	-0.126** (0.0411)	-0.00793 (0.0159)	0.00424 (0.00329)	0.00762 (0.00504)	-0.0699*** (0.0203)	-0.120** (0.0496)	-0.00806 (0.00630)	-0.0613** (0.0246)	-0.00858 (0.0167)	-0.00593** (0.00228)	-0.00224 (0.00332)	0.00849 (0.00724)	0.00976** (0.00386)	0.00494 (0.00849)	0.000951 (0.00427)
Medium firms	-0.0204 (0.0124)	-0.0224** (0.00942)	-0.0101 (0.00743)	-0.00603 (0.0135)	0.0132* (0.00643)	-0.0318** (0.0123)	0.00220 (0.00768)	-0.0153 (0.0359)	-0.00564 (0.0139)	0.00515 (0.00300)	0.00458 (0.00385)	0.00913 (0.0206)	-0.0186 (0.0464)	-0.0121* (0.00586)	-0.0239 (0.0244)	-0.00728 (0.0155)	-0.00591** (0.00189)	-0.00280 (0.00338)	0.00857 (0.00741)	0.00850** (0.00330)	0.00580 (0.00818)	-0.000905 (0.00421)
Large firms	-0.00633 (0.00934)	-0.00449 (0.0113)	-0.00622 (0.00794)	0.00606 (0.0150)	0.0176** (0.00719)	-0.0189 (0.0131)	0.00985 (0.00737)	0.0686** (0.0284)	0.00289 (0.0116)	0.00966* (0.00496)	0.00778 (0.00593)	0.0544*** (0.0153)	0.0529 (0.0384)	0.0178 (0.0108)	0.0122 (0.0219)	0.000939 (0.0135)	-0.00439* (0.00229)	0.00136 (0.00252)	0.0162** (0.00662)	0.0105** (0.00421)	0.0105 (0.00886)	0.00148 (0.00471)
R-squared	0.473	0.474	0.428	0.459	0.478	0.476	0.483	0.470	0.476	0.433	0.483	0.461	0.468	0.478	0.462	0.481	0.457	0.478	0.478	0.487	0.482	0.471
Panel C:																						
No. transactions																						
Small firms	-0.0338* (0.0165)	-0.0506* (0.0240)	-0.0139 (0.0106)	-0.00764 (0.0169)	0.0174** (0.00716)	-0.0371 (0.0227)	0.00182 (0.00861)	-0.186*** (0.0532)	-0.0127 (0.0190)	0.00415 (0.00340)	0.0119 (0.00656)	-0.0964*** (0.0292)	-0.183** (0.0608)	-0.0122 (0.00713)	-0.0755** (0.0267)	-0.0147 (0.0206)	-0.00961** (0.00310)	-0.00315 (0.00442)	0.00855 (0.0124)	0.0104** (0.00447)	0.00703 (0.00888)	0.000212 (0.00469)
Medium firms	-0.0303* (0.0140)	-0.0520* (0.0245)	-0.0151 (0.0110)	-0.00755 (0.0171)	0.0161** (0.00614)	-0.0382 (0.0231)	0.00329 (0.00833)	-0.0578 (0.0467)	-0.0126 (0.0169)	0.00515 (0.00324)	0.00822 (0.00497)	-0.00108 (0.0289)	-0.0614 (0.0568)	-0.0180** (0.00641)	-0.0358 (0.0257)	-0.0146 (0.0194)	-0.00968*** (0.00269)	-0.00407 (0.00454)	0.00820 (0.0126)	0.00887** (0.00349)	0.00759 (0.00874)	-0.00251 (0.00496)
Large firms	-0.0109 (0.00952)	-0.0305 (0.0255)	-0.00991 (0.0111)	0.00561 (0.0188)	0.0244*** (0.00686)	-0.0201 (0.0229)	0.0107 (0.00878)	0.0459 (0.0388)	-0.000852 (0.0145)	0.00997* (0.00506)	0.0131* (0.00712)	0.0547** (0.0228)	0.0281 (0.0478)	0.0133 (0.0117)	0.00554 (0.0240)	-0.00469 (0.0177)	-0.00860** (0.00336)	0.000231 (0.00385)	0.0179 (0.0117)	0.0118** (0.00388)	0.0113 (0.00995)	0.000420 (0.00576)
R-squared	0.452	0.445	0.395	0.440	0.457	0.443	0.471	0.457	0.459	0.427	0.468	0.449	0.455	0.470	0.450	0.470	0.433	0.453	0.455	0.469	0.472	0.447
Control variables	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's exporters. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), as well as new transactions. Here, the treatment period is 2016-Q3 to 2017-Q4. We breakdown destinations by blocks or single countries. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: author's compilation based on data from the South Africa Customs database.

We turn now to the analysis of the impact of Brexit uncertainty with respect to South African trade with other European agglomerates in particular. We categorize European countries into: Western EU; Central EU; Eastern EU; Northern; and Mediterranean countries. We investigate whether this effect is homogeneous across these groups. This allows us to analyse whether the increasing uncertainty between the EU and UK has affected also the trade patterns with other countries, as well within the European single market. This is because according to Figures 2–4 there has been a large fall, especially from the UK, rather than from the USA or China. To this end we report the resulting effects in Tables 14 and 15 for exporters and importers, respectively. In particular, from the export perspective what emerges is that due to the increase of policy uncertainty there has been a fall in trade mainly from Eastern and North EU countries. Note, however, that we exclude the UK from these agglomerates. The fall in exports towards these destinations suggests a general slowdown of South Africa export activity. The results for imports highlights a large decline in the growth rate across all EU countries, but in particular from Eastern and Central EU countries.

Table 14: Policy uncertainty across EU: exporters

Variables	(1) Western EU	(2) Central EU	(3) Eastern EU	(4) Northern EU	(5) Mediterranean EU
Export value					
Brexit referendum	0.0530 (0.117)	-0.00388 (0.0957)	-0.0942** (0.0340)	-0.104* (0.0497)	0.190*** (0.0535)
R-squared	0.477	0.479	0.472	0.469	0.464
No. products					
Brexit referendum	-0.0145 (0.0167)	-0.0152 (0.00950)	-0.00720*** (0.00172)	-0.0102* (0.00475)	0.00591 (0.0113)
R-squared	0.474	0.479	0.473	0.472	0.476
No. transactions					
Brexit referendum	-0.0162 (0.0409)	-0.0263 (0.0347)	-0.0219** (0.00832)	-0.0358* (0.0182)	-0.00263 (0.0315)
R-squared	0.477	0.475	0.471	0.472	0.469
Observations	355,072	355,072	355,072	355,072	355,072
Number of id_trader	40,340	40,340	40,340	40,340	40,340
Control variables	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's exporters. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. Here, the treatment period is 2016-Q3 to 2017-Q4.

Source: author's compilation based on data from the South Africa Customs database.

Table 15: Policy uncertainty across EU: importers

	(1)	(2)	(3)	(4)	(5)
Variables	Western EU	Central EU	Eastern EU	Northern EU	Mediterranean EU
Import value					
Brexit referendum	-1.077*** (0.115)	-0.835*** (0.0858)	-0.914*** (0.0888)	-0.770*** (0.0329)	-1.337*** (0.151)
R-squared	0.485	0.481	0.438	0.479	0.474
No. products					
Brexit referendum	-0.616*** (0.0223)	-0.685*** (0.0276)	-0.493*** (0.0626)	-0.612*** (0.00777)	-0.572*** (0.0320)
R-squared	0.463	0.458	0.415	0.465	0.453
No. transactions					
Brexit referendum	-0.844*** (0.0457)	-0.845*** (0.0372)	-1.039*** (0.0394)	-0.762*** (0.0189)	-0.872*** (0.0543)
R-squared	0.466	0.465	0.437	0.470	0.460
Observations	410,092	410,092	410,092	410,092	410,092
Number of id_trader	47,649	47,649	47,649	47,649	47,649
Control variables	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Brexit referendum shock on South Africa's importers. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), as well as new transactions. Here, the treatment period is 2016-Q3 to 2017-Q4.

Source: author's compilation based on data from the South Africa Customs database.

These suggest that trade uncertainties can have a significant impact on trade activity, and in particular on small businesses. Thus, policies aiming at supporting small firms during periods of global uncertainties should be adopted in order to mitigate the overall effect. To investigate whether these results are supported when employing alternative uncertainty indices, we use the global uncertainty index and re-run our analysis on imports and exports margins (Ahir et al. 2018; Baker et al. 2016; Jurado et al. 2015). The results are shown in Tables 16 and 17. What these suggest is that the global uncertainty index has a negative effect across all specifications for importers. That is, a rise in uncertainty leads to a decline in imports margins across businesses. Similar effects are revealed when employing emerging economies' or low-income countries' indices. This might be due to the fact that a relatively significant share of trade for South Africa originates from neighbouring countries. This is also the case for increasing uncertainty in the EU market. On the other hand, an increase in macroeconomic shocks within Asia or in advanced economies has a positive aggregate effect, which may be driven by large firms rather than small businesses, whereas from the export perspective, an aggregate increase in uncertainties leads to a fall in the number of destinations served. This suggest that an increase in macroeconomic shocks drives traders to focus on fewer countries to which they export more goods.

Finally we explore the potential effect of policy uncertainty surrounding the South-South Agreement (Mercosur), which entered into force in 2016-Q4. We investigate if this has been affected by global uncertainties and how trade with neighbouring countries of South Africa has been affected. Tables 18 and 19 report the results for importers and exporters, respectively. What the results highlight is that the trade agreement has led to a positive growth in imports and exports, despite a global rise in uncertainties, in particular with Brazil and Uruguay (for exports), while no statistically significant effect is estimated for Argentina and Paraguay. This suggest that a reduction of tariff exposure through trade agreements is a positive boost for trade activity (Baier and Bergstrand 2007). On the other hand, looking at the trade with countries that are part of the same agreements, the results highlight no general trend

in aggregate with respect to imports, but in terms of exports there has been a fall in some growth rates (Botswana and Zambia) and rise in others (Eswatini, Mozambique, and Angola). The breakdown of these effect by firm size in Table 20 show that medium-sized companies have particularly benefited from the Mercosur agreement with Brazil and Uruguay. It also highlights heterogeneous effects with respect to other neighbouring countries.

Table 16: Alternative policy uncertainty indices: imports

Variables	(1) Tot. exports	(2) No. trans.	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Simple average Global uncertainty index	–	–	–	–	–	–	na
GDP-weighted average Global uncertainty index	+	+	+	+	+	+	+
Advanced economies uncertainty index	–	+	+	+	+	na	na
Emerging economies uncertainty index	–	–	–	–	–	–	–
Low-income economies uncertainty index	–	–	–	–	–	–	na
Africa uncertainty index	–	+	+	+	+	+	+
Asia and the Pacific uncertainty index	na	+	+	+	+	+	+
Europe uncertainty index	–	–	–	–	–	–	na
Middle East and Central Asia uncertainty index	+	+	+	+	na	na	–
Western hemisphere uncertainty index	na	na	na	na	–	–	–

Note: this table reports the overall effect of alternative uncertainty indices on South Africa's importers. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions.

Source: author's compilation based on data from the South Africa Customs database.

Table 17: Alternative policy uncertainty indices: exports

Variables	(1) Tot. exports	(2) No. transactions	(3) No. products	(4) No. destinat.	(5) New trans.	(6) New products	(7) New destinat.
Simple average Global uncertainty index	na	+	+	–	+	+	–
GDP-weighted average Global uncertainty index	na	–	–	+	–	–	+
Advanced economies uncertainty index	na	+	+	–	+	+	–
Emerging economies uncertainty index	na	+	+	–	+	+	–
Low-income economies uncertainty index	na	+	+	–	+	+	–
Africa uncertainty index	na	+	+	–	+	+	–
Asia and the Pacific uncertainty index	na	–	–	+	–	–	+
Europe uncertainty index	na	+	+	–	+	+	–
Middle East and Central Asia uncertainty index	na	+	+	–	+	+	–
Western hemisphere uncertainty index	na	+	+	–	+	+	–

Note: this table reports the overall effect of alternative uncertainty indices on South Africa's exporters. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions.

Source: author's compilation based on data from the South Africa Customs database.

Table 18: The effect of preferential trade agreement on importers

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	BW	LS	NA	SZ	AO	MW	MZ	TZ	ZM	ZW	MU	CD	SC	MG	BR	AR	PY	UY
Panel A:																		
Imports value																		
Mercosur	-0.0324 (0.0334)	-0.0223 (0.0400)	-0.0890* (0.0428)	0.125 (0.177)	-0.0197 (0.0181)	-0.0260 (0.0430)	-0.0620* (0.0281)	-0.0125 (0.00967)	-0.0398 (0.0311)	-0.209 (0.132)	-0.0371 (0.0298)	-0.00114 (0.00179)	0.00169 (0.00126)	-0.0148 (0.0130)	3.730*** (0.848)	-0.169 (0.212)	0.0846 (0.0955)	0.0561 (0.0690)
R-squared	0.502	0.489	0.497	0.506	0.504	0.498	0.480	0.495	0.497	0.496	0.467	0.502	0.508	0.465	0.479	0.477	0.459	0.492
Panel B:																		
No. transactions																		
Mercosur	0.00413 (0.00699)	0.00189 (0.00916)	-0.0184 (0.0167)	0.0223 (0.0184)	-0.00313 (0.00211)	-0.00450 (0.00924)	-0.00849 (0.00496)	-0.00293 (0.00214)	-0.00393 (0.00599)	-0.0323 (0.0210)	-0.00838 (0.00629)	-0.000928 (0.000820)	0.000682** (0.000221)	-0.00352 (0.00247)	0.245** (0.108)	-0.0283 (0.0256)	0.00459 (0.00521)	-0.00531 (0.0129)
Observations	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092	410,092
R-squared	0.498	0.501	0.508	0.517	0.507	0.504	0.488	0.501	0.499	0.507	0.479	0.497	0.537	0.470	0.463	0.467	0.478	0.471
Panel C:																		
No. products																		
Mercosur	5.90e-05 (0.00277)	0.00103 (0.00403)	-0.00830* (0.00396)	0.00687 (0.00710)	-0.00126 (0.00117)	-0.00209 (0.00360)	-0.00504* (0.00244)	-0.00127 (0.000713)	-0.00333 (0.00242)	-0.0193 (0.0132)	-0.00349 (0.00286)	-0.000298** (0.000112)	0.000224** (8.12e-05)	-0.00112 (0.000855)	0.315*** (0.0945)	0.00517 (0.0225)	0.00402 (0.00457)	0.00755 (0.00733)
R-squared	0.497	0.494	0.503	0.510	0.496	0.492	0.480	0.495	0.496	0.506	0.464	0.495	0.521	0.453	0.447	0.481	0.483	0.497
Number of id_trader	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649	47,649
Control variables	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Mercosur trade agreement on South Africa's importers from key regional trading partners as well as with South American partners that are part of the agreement. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total imports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. The treatment period is 2016-Q4 to 2017-Q4.

Source: author's compilation based on data from the South Africa Customs database.

Table 19: The effect of preferential trade agreement on exporters

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	BW	LS	NA	SZ	AO	MW	MZ	TZ	ZM	ZW	MU	CD	SC	MG	BR	AR	PY	UY
Panel A:																		
Exports value																		
Mercosur	-0.441** (0.189)	0.0676 (0.0490)	-0.377 (0.478)	0.0869*** (0.0207)	0.0643* (0.0285)	0.113 (0.284)	0.108*** (0.0232)	0.0313 (0.0610)	-0.410* (0.192)	-0.378 (0.593)	-0.593 (0.504)	-0.0751 (0.127)	-0.0210 (0.0117)	0.00908 (0.0129)	2.766*** (0.585)	0.689 (0.376)	0.0898 (0.168)	0.675* (0.355)
R-squared	0.496	0.522	0.537	0.496	0.495	0.472	0.49	0.487	0.481	0.489	0.464	0.501	0.476	0.472	0.478	0.467	0.457	0.465
Panel B:																		
No. transactions																		
Mercosur	-0.112** (0.0458)	-0.0111 (0.0130)	-0.0244 (0.0565)	0.0193 (0.0405)	0.0289*** (0.00792)	0.0173 (0.0481)	0.0441** (0.0169)	0.0181 (0.0141)	-0.00447 (0.00730)	-0.0510 (0.0750)	-0.0569 (0.0822)	0.0129 (0.0153)	-0.00204 (0.00218)	-0.00303 (0.00302)	0.0484 (0.0633)	0.00963 (0.0745)	0.00380 (0.0132)	0.0652 (0.0381)
R-squared	0.462	0.455	0.457	0.458	0.485	0.468	0.472	0.475	0.471	0.476	0.460	0.489	0.479	0.472	0.490	0.461	0.483	0.469
Panel C:																		
No. products																		
Mercosur	-0.0734** (0.0255)	-0.00977 (0.00769)	-0.0348 (0.0529)	-0.00691 (0.0196)	0.0109*** (0.00239)	-0.00956 (0.0333)	0.0190 (0.0106)	0.00552 (0.00660)	-0.0115* (0.00531)	-0.0208 (0.0468)	-0.0239 (0.0381)	0.00109 (0.00882)	-0.00296 (0.00185)	-0.00174 (0.00127)	0.183*** (0.0554)	0.0377 (0.0316)	0.00612 (0.0107)	0.0428** (0.0189)
Observations	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072
R-squared	0.460	0.452	0.448	0.453	0.489	0.466	0.479	0.478	0.471	0.476	0.455	0.485	0.480	0.469	0.495	0.431	0.486	0.471
Number of id_trader	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340
Control variables	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Mercosur trade agreement on South Africa's exporters to key regional trading partners as well as with South American partners that are part of the agreement. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. The treatment period is 2016-Q4 to 2017-Q4.

Source: author's compilation based on data from the South Africa Customs database.

Table 20: The effect of preferential trade agreement on exporters' size

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	BW	LS	NA	SZ	AO	MW	MZ	TZ	ZM	ZW	MU	CD	SC	MG	BR	AR	PY	UY
Panel A:																		
Export value																		
Small firms	-0.653*	0.0996***	-0.781	0.0581**	0.107***	-0.154	0.189***	0.0713	0.0908	-0.883	-0.435	-0.221	-0.0290	0.0172	2.260**	0.0180	0.403	0.588
	(0.329)	(0.0295)	(0.688)	(0.0215)	(0.0223)	(0.105)	(0.0452)	(0.0619)	(0.170)	(0.779)	(0.259)	(0.279)	(0.0270)	(0.0125)	(0.740)	(0.0238)	(0.267)	(0.560)
Medium firms	-0.300	-0.0306	-0.424	0.109***	0.0532	-0.433	0.110**	-0.0185	-0.257*	-0.376	0.354	-0.00464	-0.00861	0.00925	3.165***	0.537	-0.272	1.637**
	(0.338)	(0.135)	(0.788)	(0.0326)	(0.0340)	(0.408)	(0.0383)	(0.0839)	(0.121)	(0.494)	(0.738)	(0.0298)	(0.00582)	(0.0127)	(0.495)	(0.759)	(0.294)	(0.595)
Large firms	-0.274*	0.114**	0.235	0.107**	0.0145	0.999	-0.00704	0.0214	-1.260*	0.332	-1.701	0.0640**	-0.0212***	-0.00252	3.107***	1.776**	-0.0135	-0.101
	(0.147)	(0.0415)	(0.299)	(0.0417)	(0.0727)	(0.666)	(0.0229)	(0.0417)	(0.664)	(0.564)	(1.305)	(0.0237)	(0.00430)	(0.0183)	(0.952)	(0.775)	(0.0182)	(0.204)
R-squared	0.496	0.522	0.537	0.496	0.495	0.472	0.490	0.487	0.481	0.489	0.464	0.501	0.476	0.472	0.478	0.467	0.458	0.465
Panel B:																		
No. transactions																		
Small firms	-0.129	-0.0298	-0.134*	-0.0780	0.0383***	0.00709	0.0854***	0.0335**	0.0620	-0.0651	-0.0282	0.00561	-0.00305	0.00279	-0.0854	0.0578	0.0273	0.0729
	(0.0736)	(0.0391)	(0.0628)	(0.0574)	(0.00723)	(0.0135)	(0.0242)	(0.0141)	(0.0445)	(0.116)	(0.0293)	(0.0284)	(0.00642)	(0.00275)	(0.139)	(0.0608)	(0.0177)	(0.0701)
Medium firms	-0.110	-0.0105	0.00944	0.0302*	0.0232*	-0.0715	0.0549***	0.00266	-0.00470	-0.0254	0.116	0.0155	-0.000379	-0.00492	0.216*	0.00833	-0.0257	0.138**
	(0.108)	(0.0252)	(0.111)	(0.0152)	(0.0123)	(0.0770)	(0.0136)	(0.0200)	(0.00527)	(0.0797)	(0.144)	(0.00907)	(0.00293)	(0.00515)	(0.106)	(0.0806)	(0.0276)	(0.0512)
Large firms	-0.0906	0.0147*	0.0988	0.146*	0.0208	0.115	-0.0241	0.0110	-0.0979**	-0.0552	-0.259	0.0206*	-0.00216	-0.00948	0.0803	-0.0570	-0.00174	-0.0139
	(0.0501)	(0.00774)	(0.0664)	(0.0757)	(0.0127)	(0.0839)	(0.0354)	(0.0117)	(0.0432)	(0.0646)	(0.197)	(0.0112)	(0.00153)	(0.00537)	(0.120)	(0.213)	(0.00177)	(0.0221)
R-squared	0.462	0.455	0.457	0.458	0.485	0.468	0.472	0.475	0.471	0.476	0.460	0.489	0.479	0.472	0.490	0.461	0.483	0.469
Observations	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072	355,072
Number of id_trader	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340	40,340
Control variables	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Trader FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Product-trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Note: this table reports the overall effect of the Mercosur trade agreement on South Africa's exporters, broken down by size, to key regional trading partners as well as with South American partners that are part of the agreement. The analysis is done at the quarterly level based on the South Africa Customs database for the period 2012-Q1 to 2017-Q4. We report the results on total exports, number of overall transactions (which can be broken down by product and destinations (origins)), and new transactions. The treatment period is 2016-Q4 to 2017-Q4.

Source: author's compilation based on data from the South Africa Customs database.

6 Conclusion

Policy uncertainty has significant implications for trade (Born et al. 2019; Crowley et al. 2018; Douch et al. 2018a, 2019; Handley and Limão 2017b; Limão and Maggi 2015). This paper highlights that these effects, however, are not homogeneous across businesses, but rather that small firms are more exposed to macroeconomic shocks in the case of a developing economy. By using the complete sample of traders for the largest economy in Africa, we exploit the natural field experiment resulting from Brexit to investigate how traders have reacted. What these results suggest is that, in particular, small firms are more likely to be exposed to policy uncertainty than large companies, which affects their growth patterns across trade margins. We find a negative impact across export (import) values, number of products, and number of destinations (origins) served. From the import perspective, the results show that there has been a negative impact of uncertainty across the whole distribution. However, the largest decline is experienced from rich countries. From exporters' perspectives there has been a decline within the tails of the distribution of trading partners by GDP per capita, distance, and population. However, there is positive growth within the middle of the distribution, which highlights that trade with middle-income countries has been relatively less affected by global macroeconomic shocks. One contribution to this is also due to the fact that firms export and import products of different tariff exposures. In particular, small importers tend to import products with high tariffs. Thus, increased uncertainty is likely to lead to higher threats as it's equivalent to tariffs (Handley and Limão 2017b). Thus, increased uncertainty is likely to dampen cross-border activity and productivity, as well as increase perception of higher tariff threats (Handley and Limão 2017b).

References

- Acemoglu, D., S. Johnson, A. Kermani, J. Kwak, and T. Mitton (2016). 'The Value of Connections in Turbulent Times: Evidence from the United States'. *Journal of Financial Economics*, 121(2): 368–91.
- Ahir, H., N. Bloom, and D. Furceri (2018). 'The World Uncertainty Index'. Mimeo
- Anderson, J.E., and E. Van Wincoop (2003). 'Gravity with Gravititas: A Solution to the Border Puzzle'. *American Economic Review*, 93(1): 170–92.
- Baier, S.L., and J.H. Bergstrand (2004). 'Economic Determinants of Free Trade Agreements'. *Journal of International Economics*, 64(1): 29–63.
- Baier, S.L., and J.H. Bergstrand (2007). 'Do Free Trade Agreements Actually Increase Members' International Trade?'. *Journal of International Economics*, 71(1): 72–95.
- Baker, S.R., N. Bloom, and S.J. Davis (2016). 'Measuring Economic Policy Uncertainty'. *Quarterly Journal of Economics*, 131(4): 1593–636.
- Barsky, R.B., and E.R. Sims (2011). 'News Shocks and Business Cycles'. *Journal of Monetary Economics*, 58(3): 273–89.
- Beaudry, P. and F. Portier (2006). 'Stock Prices, News, and Economic Fluctuations'. *American Economic Review*, 96(4): 1293–307.
- Beck, T., and A. Demirguc-Kunt (2006). 'Small and Medium-Size Enterprises: Access to Finance as a Growth Constraint'. *Journal of Banking & Finance*, 30(11): 2931–43.

- Bernard, A.B., S.J. Redding, and P.K. Schott (2011). ‘Multiproduct Firms and Trade Liberalization’. *Quarterly Journal of Economics*, 126(3): 1271–318.
- Besedeš, T., and T.J. Prusa (2013). ‘Antidumping and the Death of Trade’. Technical Report. Cambridge, MA: National Bureau of Economic Research.
- Bloom, N. (2009). ‘The Impact of Uncertainty Shocks’. *Econometrica*, 77(3): 623–85.
- Bloom, N. (2014). ‘Fluctuations in Uncertainty’. *Journal of Economic Perspectives*, 28(2): 153–76.
- Born, B., G.J. Müller, M. Schularick, and P. Sedláček (2019). ‘The Costs of Economic Nationalism: Evidence from the Brexit Experiment’. *The Economic Journal*, 129(623): 2722–44.
- Born, B., and J. Pfeifer (2014). ‘Policy Risk and the Business Cycle’. *Journal of Monetary Economics*, 68: 68–85.
- Bown, C.P., and M.A. Crowley (2007). ‘Trade Deflection and Trade Depression’. *Journal of International Economics*, 72(1): 176–201.
- Carballo, J., K. Handley, and N. Limão (2018). ‘Economic and Policy Uncertainty: Export Dynamics and the Value of Agreements’. Technical Report. Cambridge, MA: National Bureau of Economic Research.
- Carreira, C., and F. Silva (2010). ‘No Deep Pockets: Some Stylized Empirical Results on Firms’ Financial Constraints’. *Journal of Economic Surveys*, 24(4): 731–53.
- Clausing, K.A. (2001). ‘Trade Creation and Trade Diversion in the Canada–United States Free Trade Agreement’. *Canadian Journal of Economics/Revue Canadienne d’Économique*, 34(3): 677–96.
- Cohen-Meidan, M. (2013). ‘The Heterogeneous Effects of Trade Protection: A Study of US Antidumping Duties on Portland Cement’. *Review of Industrial Organization*, 42(4): 369–94.
- Crowley, M., O. Exton, and L. Han (2018). ‘Renegotiation of Trade Agreements and Firm Exporting Decisions: Evidence from the Impact of Brexit on UK Exports’. *Society of International Economic Law (SIEL), Sixth Biennial Global Conference*.
- Curren, E., L. Leatherby, and A. Tanzi (2018). ‘Who’s Winning the Trade War? Here’s a Look at the Scoreboard. Bloomberg’. Available at: www.bloomberg.com/graphics/2019-us-china-who-is-winning-the-trade-war.
- Dhingra, S., H. Huang, G. Ottaviano, J. Paulo Pessoa, T. Sampson, and J. Van Reenen (2017). ‘The Costs and Benefits of Leaving the EU: Trade Effects’. *Economic Policy*, 32(92): 651–705.
- Douch, M., T. Edwards, and A. Milne (2016). ‘A Briefing on the UK’s Choice of Trade Arrangements Outside of the EU’. *UK In a Changing Europe*. What type of publication is Douch et al. 2016?
- Douch, M., T.H. Edwards, C. Soegaard, et al. (2018a). ‘The Trade Effects of the Brexit Announcement Shock’. *Warwick Economics Research Papers* 1176. Coventry: University of Warwick.
- Douch, M., T.H. Edwards, C. Soegaard, et al. (2018b). ‘UK Services Exports in the Aftermath of the Brexit Announcement Shock’. Technical Report. Coventry: University of Warwick, Department of Economics.
- Douch, M., J. Du, and E. Vanino (2019). ‘Defying Gravity? Policy Uncertainty and Trade Diversion’. Working Paper. Birmingham: Ashton University.

- Eckel, C., and J.P. Neary (2010). ‘Multi-Product Firms and Flexible Manufacturing in the Global Economy’. *Review of Economic Studies*, 77(1): 188–217.
- Egger, P., and D. Nelson (2011). ‘How Bad Is Antidumping? Evidence from Panel Data’. *Review of Economics and Statistics*, 93(4): 1374–90.
- Elder, J., and A. Serletis (2010). ‘Oil Price Uncertainty’. *Journal of Money, Credit and Banking*, 42(6): 1137–59.
- Fernández-Villaverde, J., P. Guerrón-Quintana, K. Kuester, and J. Rubio-Ramírez (2015). ‘Fiscal Volatility Shocks and Economic Activity’. *American Economic Review*, 105(11): 3352–84.
- Frankel, J.A., E. Stein, and S.-J. Wei (1997). *Regional Trading Blocs in the World Economic System*. Washington, DC: Peterson Institute.
- Freund, C., and J. McLaren (1999). ‘On the Dynamics of Trade Diversion: Evidence from Four Trade Blocs’. International Finance Working Paper 637. Washington, DC: Board of Governors of the Federal Reserve System.
- Graziano, A., K. Handley, and N. Limao (2018). ‘Brexit Uncertainty and Trade Disintegration’. Working Paper 25334. Cambridge, MA: National Bureau of Economic Research.
- Handley, K. (2014). ‘Exporting under Trade Policy Uncertainty: Theory and Evidence’. *Journal of International Economics*, 94(1): 50–66.
- Handley, K., and N. Limão (2015). ‘Trade and Investment Under Policy Uncertainty: Theory and Firm Evidence’. *American Economic Journal: Economic Policy*, 7(4): 189–222.
- Handley, K., and N. Limão (2017a). ‘13 Trade under Trump Policies’. In C.P. Brown (ed.) *Economics and Policy in the Age of Trump*. London: CEPR.
- Handley, K., and N. Limão (2017b). ‘Policy Uncertainty, Trade, and Welfare: Theory and Evidence for China and the United States’. *American Economic Review*, 107(9): 2731–83.
- Head, K., and T. Mayer (2014). ‘Gravity Equations: Workhorse, Toolkit, and Cookbook’. In G. Gopinath, E. Helpman, and K. Rogoff (eds), *Handbook of International Economics*, volume 4. Amsterdam: Elsevier.
- Iacovone, L., and B.S. Javorcik (2010). ‘Multi-Product Exporters: Product Churning, Uncertainty and Export Discoveries’. *The Economic Journal*, 120(544): 481–99.
- Jurado, K., S.C. Ludvigson, and S. Ng (2015). ‘Measuring Uncertainty’. *American Economic Review*, 105(3): 1177–216.
- Konings, J., H. Vandenbussche, and L. Springael (2001). ‘Import Diversion under European Antidumping Policy’. *Journal of Industry, Competition and Trade*, 1(3): 283–99.
- Limão, N. and G. Maggi (2015). ‘Uncertainty and Trade Agreements’. *American Economic Journal: Microeconomics*, 7(4): 1–42.
- Manova, K., and Z. Zhang (2009). ‘China’s Exporters and Importers: Firms, Products and Trade Partners’. Technical Report. Cambridge, MA: National Bureau of Economic Research.
- Mattoo, A., A. Mulabdic, and M. Ruta (2017). *Trade Creation and Trade Diversion in Deep Agreements*. Washington, DC: World Bank.

- Mayer, T., and G.I. Ottaviano (2008). 'The Happy Few: The Internationalisation of European Firms'. *Intereconomics*, 43(3): 135–48.
- Mumtaz, H., and P. Surico (2018). 'Policy Uncertainty and Aggregate Fluctuations'. *Journal of Applied Econometrics*, 33(3): 319–31.
- Nocke, V., and S. Yeaple (2014). 'Globalization and Multiproduct Firms'. *International Economic Review*, 55(4): 993–1018.
- Osnago, A., R. Piermartini, and N. Rocha (2015). 'Trade Policy Uncertainty as Barrier to Trade'. WTO Staff Working Paper. Geneva: World Trade Organization.
- Pierce, J.R., and P.K. Schott (2016). 'The Surprisingly Swift Decline of US Manufacturing Employment'. *American Economic Review*, 106(7): 1632–62.
- Prusa, T.J. (2001). 'On the Spread and Impact of Anti-Dumping'. *Canadian Journal of Economics/Revue Canadienne d'Économie*, 34(3): 591–611.
- Roberts, M.J., and J.R. Tybout (1997). 'The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs'. *American Economic Review*, 87: 545–64.
- Romalis, J. (2007). 'NAFTA's and CUSFTA's Impact on International Trade'. *Review of Economics and Statistics*, 89(3): 416–35.
- Sampson, T. (2017). 'Brexit: The Economics of International Disintegration'. *Journal of Economic Perspectives*, 31(4): 163–84.
- Schmitt-Grohé, S., and M. Uribe (2012). 'What's News in Business Cycles'. *Econometrica*, 80(6): 2733–64.
- Steinberg, J.B. (2019). 'Brexit and the Macroeconomic Impact of Trade Policy Uncertainty'. *Journal of International Economics*, 117: 175–95.
- Stokey, N.L. (2016). 'Wait-and-See: Investment Options under Policy Uncertainty'. *Review of Economic Dynamics*, 21: 246–65.
- Tang, M.-K., and S.-J. Wei (2009). 'The Value of Making Commitments Externally: Evidence from WTO Accessions'. *Journal of International Economics*, 78(2): 216–29.
- Vandenbussche, H., and M. Zanardi (2010). 'The Chilling Trade Effects of Antidumping Proliferation'. *European Economic Review*, 54(6): 760–77.
- Yotov, Y.V., R. Piermartini, J.-A. Monteiro, and M. Larch (2016). *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model*. Geneva: World Trade Organization.