

Current report

Exchange Rate Effects of a Potential Brexit on German-UK Bilateral Trade

11/2016

What to expect

In this report we look at German-UK bilateral trade in goods and estimate the short-run sensitivity of imports and exports of Germany and the UK to exchange rate movements.

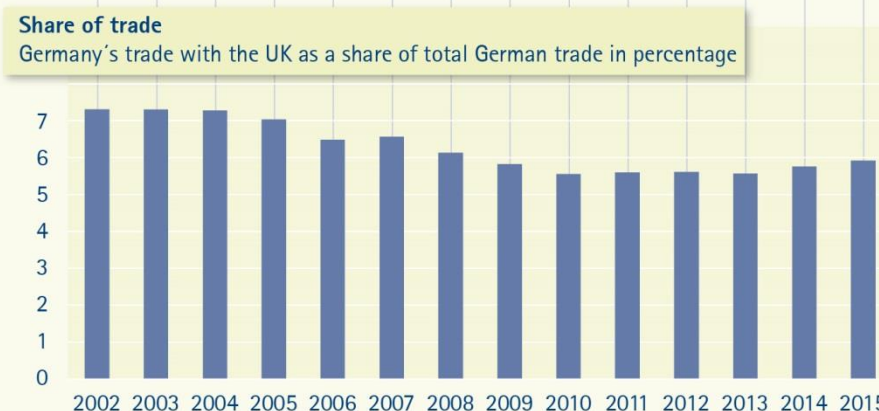
1 German Trade with the United Kingdom

On June 23rd the United Kingdom and Gibraltar will hold a referendum whether to stay in the European Union or not. The topic of what the consequences may be is rather large spanning many aspects of social, political and economic life. In this current report we look at bilateral German-UK trade and its short-run sensitivity to exchange rate fluctuations. We look at the trade numbers and explain what this sensitivity means.

According to United Nations Comtrade data both exports and imports between Germany and the UK have been increasing until the great recession in 2008 and have been on the decline for two consecutive years. While German exports have rebounded, imports from the UK are currently at a low level comparable to 2009 (see Figure 1).

During the last 14 years the share of total trade with the UK (exports and imports combined) has been somewhat on the decline for Germany. There are many factors that determine the amount of trade between two countries: general demand and supply factors in the trading countries, tariffs, quotas, bureaucratic hurdles, transportation costs, exchange rate fluctuations.

Figure 1
Bilateral trade between Germany and the UK 2002 - 2015



Source: UN Comtrade Data

2 The Exchange Rate Effect

One can be sure that a potential Brexit will increase the barriers to trade. It is likely that the amount of red tape and transaction costs especially in the short run will increase. Both the UK and Germany are World Trade Organization members and at least the most-favoured-nation-rule would apply even in the absence of a bilateral UK-EU trade agreement. Such an agreement in the case of a Brexit will most probably be negotiated but it is uncertain when and in what shape.

What will have a more profound and a quicker to notice effect on bilateral trade is the response of the capital markets, which would in turn lead to changes in the exchange rate. It is very likely that a higher uncertainty in the UK economy and changing incentives for foreign direct investment there will lead to a depreciation of the pound sterling relative to the euro. It is beyond the scope of this report to discuss the consequences for the financial industry or the response of foreign direct investment and how the pound could be affected. We do however want to suggest to what extent a potential change in the exchange rate might affect bilateral trade with Germany in the short run.

In order to obtain a rough estimate of the potential impact of the exchange rate movement on German-UK bilateral trade flows we can examine the values of the so-called "exchange rate elasticity" of exports and imports. This value indicates the short-run sensitivity of trade flows with respect to fluctuations in the exchange rate. For example, if the exchange rate is measured in foreign currency for one euro, an elasticity of German exports of minus 5 would mean that if the euro appreciates by one percent with respect to any of Germany's main trade partners' currencies, German exports would decrease by 5 percent.

The aforementioned elasticity is obtained using linear regressions. In general, regression techniques allow the researcher to compute coefficients which indicate the extent to which a given variable (in our case trade flows) changes as any other considered variables change. Hence, using regressions for German and UK imports and exports and the exchange rate will allow us to recover the elasticity we are interested in. The results of the regressions are reported in Table 1. Notice that the exchange rate is measured in local currency units with respect to the euro or to the pound (depending on whether we are measuring the German or UK elasticity). Hence, an increase in the exchange rate indicates an appreciation of the euro or the pound, while a decrease indicates a depreciation. The significance level of the estimated elasticities indicates the statistical certainty with which we can state that the estimates are different from zero. A non-significant coefficient can be considered as evidence that the estimated relationship between the considered trade flow and the exchange rate might be very weak or non-existent.

Table 1

Exchange rate elasticities of German and UK exports and imports

	Germany		UK	
	Exports	Imports	Exports	Imports
Elasticity	-0.012	0.081**	-0.095*	-0.027
Number of Observations	537	537	522	522

* significant at 10%, ** significant at 5%. The displayed elasticities are percentage changes of exports or imports associated to a one percentage change in the exchange rate (expressed as local currency units against euro for the German estimations, and against the pound for the UK estimations), obtained from regressions of German and UK imports or exports with the other OECD partner countries, plus China and Russia. The time frame of the data is 1999-2014. The other variables included in the regressions are: GDP level of the trading partners, population sizes, geographical distance between trading partners, common official language. See section 4 for further details on the data and sources.

Those regressions are rather simple and it should be noted that they show a correlation and not causality between exchange rate movements and imports or exports. They show a historical connection between the variables and one cannot conclude that this correlation will remain unchanged after an event like a potential Brexit. As a matter of fact most likely it will not, especially for the UK, which can expect bigger changes to its economy compared to other EU countries.

The elasticity of trade in the estimations is based on an average response of trade of Germany or the UK with a number of other countries from 1999 to 2014. The elasticity of German trade with respect to changes in the pound might be different to the elasticity with respect to changes in the US dollar for instance. Conclusions we draw from this unified coefficient of trade elasticity to changes in a single currency will be based on the assumption that the elasticity is identical for all currencies. The coefficients can be nevertheless suggestive and give some preliminary indication of potential future changes in trade.

According to our estimations for Germany, a one percent increase in the exchange rate (i.e. an appreciation of the euro) has been associated with a 0.01 percent decrease of exports from Germany to the considered partner countries. The estimated elasticity of exports is however not significantly different from zero. A one percent appreciation of the euro increases imports by 0.08 percent. The elasticity of imports with respect to the exchange rate is statistically significant at the 5% level.

Given 2015 trade data a potential one percent appreciation of the euro with respect to the pound would decrease German exports by 9.9 million US dollars and increase German imports by 34.3 million US dollars.¹ One should also note that even if the estimated elasticity of imports is significant, we cannot conclude that Germany would end up importing more from the United Kingdom, because after a Brexit trade diversion effects could take place and Germany might shift to importing more from other EU countries.

¹ Those are small numbers relative to the size of German trade with the UK, 99 billion US dollars exports and 42 billion US dollars imports in 2015.

Our UK regressions show a somewhat different picture. A one percent appreciation of the pound would decrease UK exports by 0.095 percent and decrease imports by 0.027 percent, the coefficient of the former being statistically significant and of the latter not. Intuitively an appreciation of the pound should lead to an increase in UK imports, a positive coefficient. The coefficient we find is negative but not statistically significant and therefore less precise.

3 Conclusion

Assuming constant barriers to trade, German exports will probably be little affected through exchange rate movements in the short run. According to our calculations, even large swings in the euro pound exchange rate will not lead to sizeable changes in aggregate German trade. Clearly there might be some sectors more affected than others like the auto industry, which comprised about 32 percent of all German exports to the UK in 2015, but nevertheless the exchange rate channel can be expected to be small.

There will be of course a number of other factors surrounding the outcome of the Brexit referendum, both political and economic, that will play a much more important role.

4 Description of the Data and Sources

The time frame we have used in our regressions is 1999-2014. We look at data for the following countries: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States, China, and Russia. Trade flows data comes from the OECD – STAN database on Bilateral Trade in Goods by industry and end-use category. The unit of measurement is thousands of US dollars. For GDP values we use the OECD Economic Indicators, the unit of measurement is current millions of US dollars (current prices, constant exchange rate, OECD base year 2010). The source of population data is the World Bank WDI 2016. Distance and common official language come from the CEPII gravity dataset as used in Head et al. (2010). Nominal exchange rates come from the European Central Bank (ECB) for all countries except for Chile and Iceland, for which ECB data are not available, so we use World Bank WDI indicators (2016).

References

Head, K., Mayer, T. & Ries, J. (2010), "The erosion of colonial trade linkages after independence. *Journal of International Economics*," 81(1):1-14.

Imprint

Publisher

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Date of publication

7 June 2016

Technical completion

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