



Economic Letter

Brexit Through the Gift Shop: No Refunds

by Michael Sposi and Kelvinder Viridi

ABSTRACT: The effects of Brexit through higher barriers to trade could cost British households the equivalent of 428 British pounds annually or \$580 in 2016 prices. Effects across the rest of the EU would vary, but countries that trade extensively with the United Kingdom, such as Ireland, stand to incur the greatest losses.

Britain voted to leave the European Union (EU) on June 23, 2016, setting the stage for the government to notify the EU of its intention to withdraw from the trade bloc by March 2019. While British voters were optimistic that greater protectionism would provide a gift of improved economic well-being, theory suggests otherwise.

Brexit, the common term for the United Kingdom's departure from the EU, will likely significantly affect trade, foreign direct investment and immigration between Britain and much of the continent.

While Brexit will result in new policies, trade is likely to be among the most apparent changes, with the possibility of new barriers affecting economic activity and welfare. The U.K.'s negotiation with the EU and affiliated countries regarding new trade rules will determine Brexit's economic ramifications. As an EU member, the U.K. has access to the European Single Market and largely duty-free trade.

If officials cannot reach an agreement with the EU by March, they may have to fall back on the tariffs and quotas set by the World Trade Organization (WTO)—a scenario often referred to as “hard” Brexit.¹

Assuming that the U.K. leaves the EU

and a new regime of tariffs follows, higher trade costs could mean the average U.K. household will incur an added expense of about 428 pounds or \$580 in 2016 prices, analysis suggests. In aggregate, the EU will experience much milder overall effects that equate to a 0.10 percent loss in welfare. Non-EU members will not be meaningfully affected.

Even if the U.K. and the EU enter a free-trade agreement in the future, Brexit will impose short-run losses.

EU Specialization, Trade

The U.K. and EU are a highly integrated goods market. A total of 46 percent of U.K. trade is with other EU countries; conversely, the U.K. accounts for 12 percent of EU trade. Imposition of higher tariffs would be strongly felt in the U.K. and to a varying degree among other EU members.

The tariff change would immediately raise consumer prices as well as the prices firms pay for intermediate inputs. Additionally, investment goods such as machines and equipment, which are highly traded, would become more costly.

The allocation of factors of production—including capital and labor—across sectors and countries would be disrupted. Absent tariffs, countries generally spe-

► U.K. imports from the EU decline by 11 percent of gross domestic product (GDP), and U.K. total factor productivity (output per unit of capital and labor employed) falls 0.6 percent.

cialize in producing and exporting goods for which they have comparative advantage—electronic equipment in Germany or pharmaceutical products in Ireland, for example. Distortions introduced by tariffs can reduce international competitiveness and negatively affect aggregate productivity.

Less-traded service activity would not be immune to higher tariffs on goods because of linkages between goods- and service-producing sectors. Service firms' global spending on material inputs amounted to 31 percent of total expenditures on intermediate inputs, based on 2014 data from the World Input-Output Database.² Additionally, the goods sector accounts for 13 percent of global service-sector sales. Thus, declining goods production would translate into weaker demand for services.

Macroeconomic Effects

To assess the impact of the hard Brexit scenario, it's assumed that tariffs between the U.K. and the EU increase to WTO-set levels—the cost of the U.K.'s imports from EU countries would, on average, rise 3.58 percent, while the cost of U.K. exports to the EU would increase 2.12 percent.

Nontariff barriers—quotas and regulations—are generally agreed to be larger than direct tariff barriers. Estimates sug-

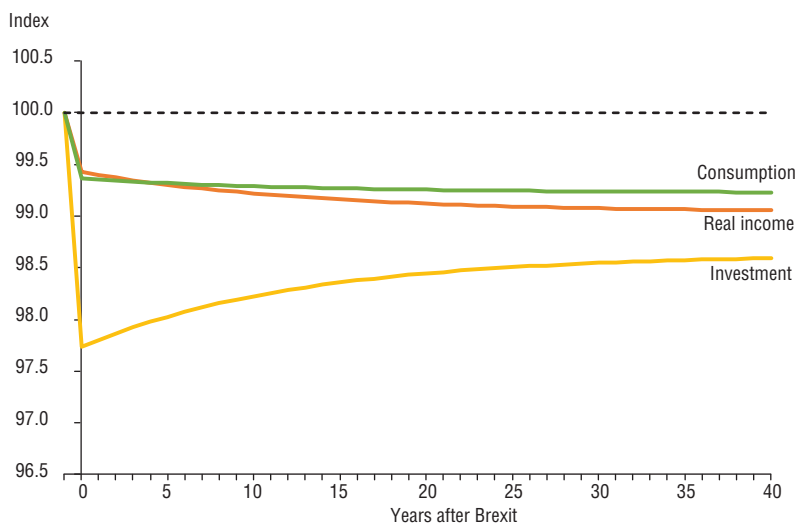
gest that nontariff barriers would rise by a tariff-equivalent amount of 6.53 percent for U.K. imports from the EU and by 5.21 percent for U.K. exports to the EU.³

This calculation assumes all other policies are kept in place, such as those governing migration and foreign investment, allowing isolation of Brexit-induced trade policy impact on the economy. A model developed in part by one of this article's authors takes into account bilateral trade flows between each of the EU countries, including the U.K. and other countries.⁴ The model depicts how investment prices and consumer prices respond, as well as the linkages between various economic sectors.

The model's implications are generally consistent with expectations. As soon as the higher tariffs take effect, prices of imports increase, thereby deteriorating real (inflation-adjusted) wages. Upon impact, real income in the U.K. falls by 0.5 percent as the wage rate declines relative to the consumer price level (*Chart 1*).

Furthermore, some of the goods the U.K. previously imported would be produced domestically by less-efficient firms. For instance, U.K. imports from the EU decline by 11 percent of gross domestic product (GDP), and U.K. total factor productivity (output per unit of capital and labor employed) falls 0.6 percent.

Chart 1 | Model Anticipates Falling U.K. Consumption Following Brexit



NOTE: Brexit occurs at year 0. Values are indexed to 100 in the year before Brexit.

SOURCES: World Input-Output Database 2016; Penn World Trade Tables 9.0; authors' calculations.

Reduced real income leads to lower consumption and investment. However, the decline in investment would likely exceed the decline in consumption because, as in almost every country, the investment purchases contain a large share of traded components such as machinery. Conversely, consumption purchases contain relatively more non-traded items, such as health care.

As a result, the stock of capital in succeeding years declines, lowering the economy's productive capacity for years to come. Further shrinking of real income occurs and, in turn, prompts additional declines in consumption and investment. Eventually, the model economy settles into a stationary state with permanently lower real income, consumption and investment.

The U.K.'s ratio of net exports to GDP increases with Brexit, not because of higher exports, but because of lower imports due to higher import prices (*Chart 2*). Over time, as production declines, U.K. exports gradually fall so that, over the long run, the trade deficit is permanently larger—0.9 percent of GDP versus 0.8 percent before Brexit.

Implications for Welfare

Summarizing all of these effects in terms of their total impact on well-being, or welfare, is challenging. To evaluate welfare, economists typically focus on consumption. That is, investment and net exports constitute national saving, which is effectively a means of transferring consumption over different points in time.

A welfare function evaluates the net present value of a particular stream of consumption over time. Changes in welfare are computed by comparing the consumption status quo against a counterfactual—in this case, consumption as predicted by the model following Brexit.

In this context, it's helpful to consider consumers' welfare function in terms outlined by Nobel Prize-winning economist, Robert E. Lucas.⁵ First, consumers tend to place a premium on current consumption relative to future consumption. Typically, economists apply a value of 0.96 to annual data, so 100 units of consumption one year from now are worth only 96 units of consumption today. Second, consumers tend to prefer smooth

paths of consumption to paths exhibiting large year-to-year swings.

Applying the welfare function to the Brexit-induced path of consumption in the model, the welfare effect on the U.K. is equivalent to a permanent decline in per capita consumption of 0.7 percent. Equivalently, we say that the welfare cost of Brexit to the U.K. is 0.7 percent. This amounts to about 428 British pounds

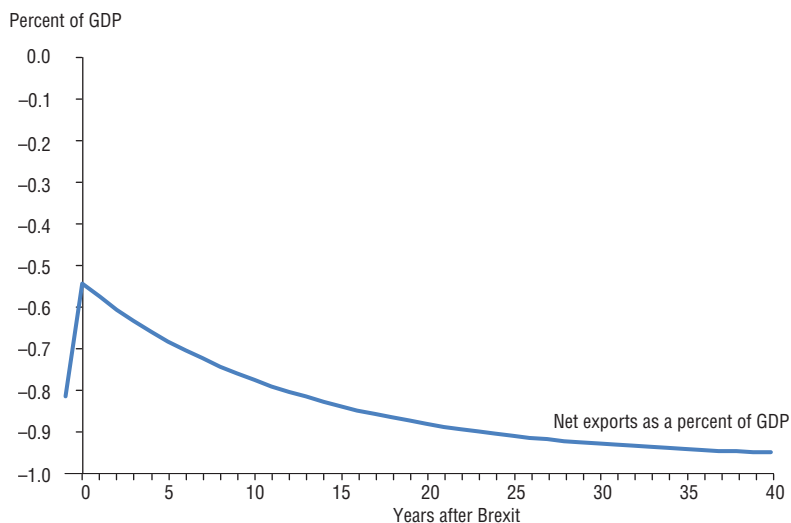
(equal to \$580) worth of consumption per household annually in 2016 prices.

Impacts Close to Home

The welfare costs of Brexit are larger for the U.K. than elsewhere in the EU, except for Ireland (*see map*). The U.K. would face increased trade barriers with all 26 other EU members, while each EU member would face higher trade barriers

Chart 2

U.K.'s Net Exports Slip After Peaking as Brexit Takes Hold

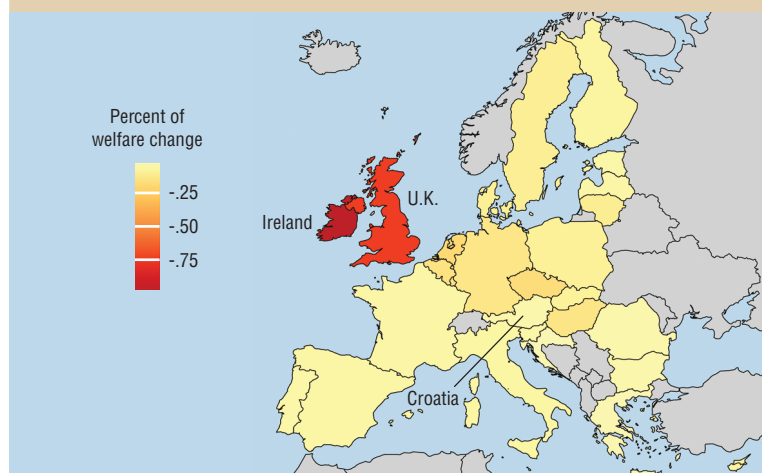


NOTE: Brexit occurs at year 0. Values are indexed to 100 in the year before Brexit.

SOURCES: World Input-Output Database 2016; Penn World Trade Tables 9.0; authors' calculations.

Map 1

Brexit Affects the U.K., Ireland More than Most EU Countries



NOTES: The map reports changes in welfare for EU members only. Countries that are not part of the EU are in gray.

SOURCES: World Input-Output Database 2016; Penn World Trade Tables 9.0; authors' calculations.

Table 1
Brexit Effects Vary Among Countries

Country	Percent change in welfare
United Kingdom	-0.73
European Union (excluding United Kingdom)*	-0.10
Ireland	-0.98
Finland	-0.07
Croatia	-0.01
Non-European Union*	0.01
Norway	0.10

*Welfare for aggregates is computed by summing across members of the aggregate.

SOURCE: World Input-Output Database 2016; Penn World Trade Tables 9.0; authors' calculations.

with only the U.K. However, the impact isn't the same throughout.

For instance, Ireland, the biggest Brexit loser, stands to experience a welfare decline of almost 1 percent because of extensive trade ties, which account for 31.5 percent of Ireland's GDP.⁶ On the other hand, Croatia is the EU country that is least affected by Brexit; Croatia's trade with the U.K. accounts for only 2.2 percent of Croatia's GDP.⁷

The effect on welfare for the entire EU is mild; the welfare cost is -0.1 percent (Table 1). Finland, which represents the median EU country in terms of changes in welfare, stands to lose just less than 0.1 percent.

Non-EU countries are mostly immune to Brexit developments, although there are some exceptions, such as Norway. Because Norway is not part of the EU, tariffs on its imports and exports do not

change. Instead, as a result of geography, some trade that formerly would occur between the EU and the U.K. will likely be diverted to Norway. For instance, Norway's trade with the EU, including the U.K., could increase by 0.1 percent. In turn, Norway could realize a 0.1 percent welfare increase.

Overall, economic consequences of Brexit will accrue over many years, although most of its effects will be realized in the short run. The U.K. stands to lose just over 0.7 percent in terms of welfare. Effects on the rest of the EU would likely be mild, with the exception of Ireland, which could lose close to 1 percent in welfare.

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Notes

¹ "Soft" Brexit is less well-defined but is widely believed to imply a free-trade agreement between the U.K. and the EU.

² See "An Illustrated User Guide to the World Input-Output Database," by Marcel P. Timmer, Erik Dietzenbacher, Bart Los, Robert Stehrer, and Gaaitzen J. de Vries, *Review of International Economics*, 2015, vol. 23, no. 3, pp. 398–411.

³ For tariffs corresponding to a hard Brexit, see "Brexit and the Macroeconomic Impact of Trade Policy Uncertainty," by Joseph Steinberg, University of Toronto, Working Paper, 2017. For measures of nontariff barriers in the EU, see "Non-Tariff Measures in EU–U.S. Trade and Investment: An Economic Analysis," by Joseph Francois, Koen Berden, Saara Tamminen, Martin Thelle and Paul Wymenga, 2013, IIDE Discussion Paper 20090806, Institute for International and Development Economics.

⁴ See "Capital Accumulation and Dynamic Gains from Trade," by B. Ravikumar, Ana Maria Santacreu and Michael Sposi, Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute Working Paper no. 296, Federal Reserve Bank of Dallas, 2017.

⁵ See "Macroeconomic Priorities," by Robert E. Lucas Jr., *American Economic Review*, 2003, vol. 93, no. 1, pp. 1–14.

⁶ Trade between Ireland and the U.K. accounts for 15.1 percent of Ireland's total trade.

⁷ Trade between Croatia and the U.K. accounts for 2.3 percent of Croatia's total trade.

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