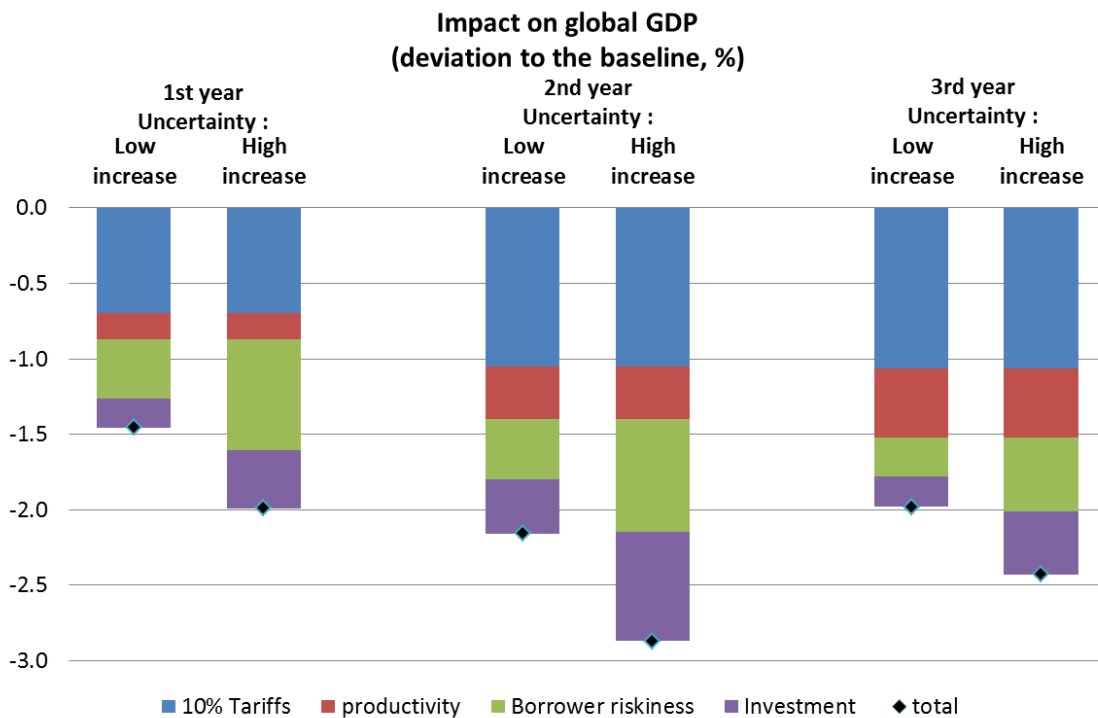


Quantifying the losses from a global trade war

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No one wins a trade war. Based on a multi-region dynamic general equilibrium model (GIMF), we show that a global and generalised 10 percentage point increase in import tariffs could reduce global GDP by 1% after two years. This effect could be amplified by a fall in productivity, a rise in the financing cost of capital and a decline in investment demand. Taking all these factors into account could result in lowering global real GDP by up to 3% after two years.

Chart 1: Impact of a generalised 10 percentage point increase in tariffs on global real GDP



Note: Effects of each corresponding shock taken in isolation. Results are obtained using the Global Integrated Monetary and Fiscal Model (GIMF). A “Low” (“high”) increase in uncertainty corresponds to a one (two) standard deviation shock to borrower riskiness and to uncertainty affecting investment.

Since the beginning of 2018, the US administration has announced a series of protectionist measures for products such as steel and aluminum. While the overall volume of trade covered so far by a global rise in protectionism remains limited (less than 2% of global imports), new measures have been considered by governments. Following China's decision to retaliate against US tariffs on Chinese goods, the White House announced in July that additional tariffs covering about USD 200 billion of imports from China could be applied. At the same time, automobiles and auto parts imported by the United States could also be subject to a 25% import tariff.

These threats to the global trading system have exacerbated the fear that a global trade war generalised to all goods and all trading partners could break out.

Impact of a global trade war: lessons from trade models

The general perception of economists about trade wars is that they are not easy to win, even for large countries such as the United States. Unilateral protectionist measures are often subject to retaliation by trade partners, as recently observed following the tariffs imposed on steel and aluminum.

Against this backdrop, different methods can be used to quantify the losses from a trade war. In a widely circulated [blog post on the New York Times](#), Paul Krugman reports that in simulations based on general equilibrium quantitative trade models, a 30 to 60 percentage point (pp) increase in import tariffs would lead to a global real GDP loss of 2% to 3% over the long term. Similar figures are provided in a [recent note](#) published by the French Council of Economic Analysis -CAE), which states that a 60 pp increase in import tariffs would result in a 3% to 4% decline in real GDP in large economies. The relatively low impact is explained by the moderate trade openness, even including trade in services, of major economies such as the United States (27%) but also the European Union (35% excluding intra-EU trade) as reported by [the EU Commission \(p.22\)](#). However, the cumulated impact (in terms of wealth) is much larger, as GDP falls below its potential every year.

Quantification based on international macroeconomic models

The quantification of the short-term costs of a trade war in international macroeconomic models may differ from the prediction based on general equilibrium quantitative trade models that focus on the long-term horizon ("steady state"). Possible reasons for this discrepancy include the more complete description of short-term dynamics in international macroeconomic models, which may include frictions in different markets (financial, labour or goods markets) and the reaction of monetary policy. In principle, the question of whether these international macroeconomic models lead to larger or smaller losses in the short and medium term compared with the long-term horizon of general equilibrium quantitative trade models is ambiguous.

In Chart 1, we present the results of a simulation based on a multi-region, forward-looking DSGE model (the [GIMF model](#)). We consider the 3-region version of the model, including the United States (US), the euro area (EA) and remaining countries (RC). The full trade war scenario consists in a permanent 10 pp increase in tariffs on imports of both intermediate and final goods in the three regions and for all trading partners. This increase distorts supply and demand conditions in each economy. On the demand side, import tariffs raise the price of imported goods and lower final consumption. When foreign trade partners retaliate, foreign import tariffs also reduce the external demand addressed to domestic producers, leading to a further reduction in output. On the supply side, import tariffs also act as a negative shock by increasing the cost of intermediate goods used for firms' production. The macroeconomic response of output is unambiguously negative. Our baseline simulation shows that the macroeconomic impact of a 10 pp increase in tariffs on global output would amount to -0.7% in the first year and -1.0% at the end of the second year following the shock.

Using the same framework, a simulation of a 60 pp increase in import tariffs would cause a 6% loss in global real GDP in the short term. The long-term impact in this simulation is very similar to the one obtained using general equilibrium quantitative trade models.

The amplification effects of a global trade war

Beyond the direct trade policy shock resulting from a rise in import tariffs, several factors associated with a trade war may amplify the decline in global GDP:

- a fall in productivity, as a result of an inefficient reallocation of factors of production across firms;
- a rise in the financing cost of capital due to an increase in actual or perceived borrower risk;
- a decline in investment demand, caused by firms' "wait and see" attitude in a context of higher uncertainty about future business conditions.

The importance of these channels, considered in an alternative simulation, relies on elasticities found in the literature ([Berthou, Chung, Manova and Sandoz \(2018\)](#) for the productivity shock and [Bussière, Ferrara and Milovitch \(2015\)](#) for investment demand). Taking account of these amplification factors, the generalised and global 10pp increase in import tariffs could lower global GDP by around 1.5% to 2.0% in the first year and 2.2% to 2.9% in the second year, depending on whether the increase in uncertainty is assumed to be "low" or "high" (a 50 to 100 basis point rise in the external finance premium and a one to two standard deviation increase in the volatility index VIX). It is important to note that an increase in uncertainty may produce negative and immediate effects on output even if a full trade war does not occur.

What can we expect from a trade war escalation?

According to the [WTO, World Tariff Profiles 2017, p.8.](#), while non-tariff barriers to trade may be high in some goods sectors (especially agriculture) and services, the average import tariff applied in advanced economies is quite low (5.2% in the European Union, 3.5% in the United States), and much larger in emerging economies such as China (9.9%). A 10 pp counterfactual increase in tariffs would represent a moderate rise in protectionism, whereas a 60 pp increase would lead to a surge in protectionism.

During the Great Depression in the 1930's, average trade-weighted import tariffs were raised from about 10% to 20%, with much larger increases in continental European than in North America (see [Crucini and Kahn, 1996, Table 2](#)). Recent work on trade theory shows that worldwide import tariffs as high as 60% could be optimal in a world without any form of cooperation (i.e. in a world with no World Trade Organization and no bilateral trade cooperation, see [Ossa, 2014](#)). Such prohibitive tariffs would lead to the collapse of the world trading system and, as we have seen, important GDP losses starting from the first year of implementation.