Consequences of increasing protectionism

In some parts of the world, protectionist tendencies are on the rise once more. This is particularly true of the United States, which has adopted a more restrictive trade policy stance in recent times. By imposing additional tariffs on China and other trading partners, the US Administration hopes to win trade concessions as well as to strengthen its own economy and boost domestic employment.

However, following the escalation of the US-China trade dispute, there has been a decrease not only in US imports from China but also in US exports to China. In addition, there have been no indications to date that the United States has either substituted its imports from China with third-country imports or increased domestic production of these goods on a large scale. Chinese exporters do not appear to have made any substantial price concessions, either. All of this suggests that neither the US economy nor US consumers have benefited from the realignment of the country's trade policy thus far.

Furthermore, the empirical evidence indicates that no "lucky bystanders" have profited as yet from the dispute between the United States and China. While trade diversion effects appear to have been largely non-existent, trade policy disputes are likely to have exacerbated uncertainty worldwide. This, in turn, has probably put additional strain on investment and thus global economic activity. Should an all-out trade war break out between the United States and the European Union, the consequences for the global economy could be far graver still.

Counteracting protectionist efforts would require the rules-based trading system, with the World Trade Organization (WTO) at its core, to be strengthened. This involves amending rules with a view to improving the protection of intellectual property and addressing the way in which it deals with state-owned enterprises. However, the success of such an ambitious push for reform depends on the constructive participation of all WTO members. Trade agreements such as those concluded on an ever more frequent basis by the European Union in recent times are only an imperfect substitute for a functioning multilateral order.

Introduction

Tightening of US trade policy under President Trump

As part of its "America First" strategy, the US Administration under President Trump has adopted a tougher trade policy stance, particularly towards China. The conflict between the two largest economies in the world has escalated dramatically over the course of the past two years: additional tariffs implemented by the United States were countered with retaliatory measures from China, in turn prompting further US tariffs. The US Administration has gone on the trade offensive against other trading partners, too, even close political allies such as the European Union.

Protectionist tendencies on rise once more in other countries, too

Protectionist tendencies are on the rise once more in other countries, too. Aside from tariffs, non-tariff barriers to trade, such as restrictions on government procurement and subsidies, are being utilised to a greater extent. According to the Global Trade Alert database, which records a broad spectrum of trade policy restrictions, many more measures have been registered worldwide in the past two years than previously.[1]

Past trade policy liberalisation made globalisation possible …

Rising protectionism in many parts of the world represents a turning point for international trade policy, which for decades had, conversely, been shaped by efforts to increase liberalisation. In that setting, a series of formerly non-market emerging and developing economies successfully integrated into the international division of labour. Technological progress and decreasing communication and transport costs further promoted the process of globalisation. As a result of these developments, world trade experienced rampant growth.[2]

… but also had adverse effects in industrial countries

When emerging economies entered the market, consumers in industrial countries obtained access to cheaper goods and a wider range of products. At the same time, increasing competition from foreign rivals drove structural change forward in many parts of the world. In particular, low earners with limited geographical and sectoral mobility suffered job and income losses.[3] In some instances, economic and social policy reforms that could have facilitated the adjustment process were neglected.

Current account imbalances under fire

Above and beyond negative employment effects, some advocates of a more restrictive trade policy also use the large, persistent balances on national current accounts to justify their stance. The present US Administration, for instance, views the extensive surplus and deficit positions as proof of an uneven distribution of the current world trading system's benefits. Specifically, exception has been taken to the high US-China bilateral trade deficit, deemed by the United States to have been achieved

Number of new trade policy measures* worldwide

Source: Global Trade Alert database. * Affecting trade in goods. Data exclude late reports for the respective reporting year (the cut-off date being 31 December of that year).
Deutsche Bundesbank

1 However, it should be noted here that the measures are simply counted and not weighted by importance. Global Trade Alert (https://www.globaltradealert.org) is an initiative launched by the Centre for Economic Policy Research (CEPR).
2 Trend growth in global trade flattened out to a significant extent more recently – prior to the current rise in protectionist tendencies, even. This is partly due to the slowdown in global economic growth. However, the lower trade intensity of economic growth in China, which was linked to its evolution from a "small" to a "large" economy, also played a role here. See Deutsche Bundesbank (2016).
3 For a more in-depth discussion, see Deutsche Bundesbank (2017).

through "unfair" trading practices.[4] However, current account balances reflect saving and investment decisions, first and foremost, and cannot be labelled as either good or bad without first analysing the reasons behind them.[5] Moreover, bilateral balances should be interpreted with particular caution as they also reflect differing national production and demand patterns.[6]

How tariffs work

Tariffs as a type of tax on imports …

By imposing additional tariffs, the United States hopes to win trade concessions from its partner countries and bring down its trade deficits, as well as strengthen its own economy and boost domestic employment. This view is based on the notion that a tariff acts like a tax on imported goods, making domestically produced goods more competitive. However, an import substitution such as this presupposes that domestic enterprises are able to manufacture goods that could be considered substitutes. If tariffs target a specific country, as is the case with the additional tariffs imposed on Chinese goods by the United States, consumers may also switch to similar products from other countries. The easier it is to substitute a product subject to tariffs with another product produced domestically or by a third country, the more price-elastic the demand for that product will be. In the long term, such elasticities are typically fairly high (see the box on pp. 48 f.), but often tend to be rather low in the short term as tapping into new procurement and sales channels requires time and money.[7]

… result in higher domestic prices

Taken in isolation, a tariff increases the prices of imported goods for the domestic population. This reduces the purchasing power of households and enterprises and has a tendency to dampen domestic demand.[8] However, import tariffs may put foreign providers under pressure to reduce export prices, particularly in the case of goods with high trade elasticity. The price-increasing effect would then be lower.[9] This would also be the case if imposing tariffs resulted in an appreciation of the domestic currency.[10]

Losses also to be expected for exports

The domestic export industry is usually one of the victims of tariff increases. This is immediately apparent when trading partners retaliate by likewise increasing tariffs. In addition, a currency appreciation triggered by tariffs would erode price competitiveness in the international markets. Tariffs on foreign intermediate goods are particularly damaging to the domestic economy as they make domestic production more costly (see the box on pp. 52 ff.).

Adverse macroeconomic effects in medium and long term, at latest

Overall, therefore, there is much to suggest that raising import tariffs hardly leaves an economy as a whole better off in the short term. Detrimental effects can be expected to predominate in the medium and long term, at the latest, as the decline in competitive intensity associated with increasing insularity tends to weaken domestic productivity growth.[11] In add-

4 The United States accuses China of violating intellectual property rights, restricting market access for foreign enterprises and subsidising domestic enterprises, in particular. Other trading partners of China, such as the European Union, agree with some of these points. However, the European Union's measures comply with the WTO's rules, which include the targeted use of trade defence instruments such as anti-dumping tariffs. See European Commission (2019).
5 For a more in-depth discussion, see Deutsche Bundesbank (2017).
6 Furthermore, US imports from China specifically also contain a certain amount of value added from other economies, not least from the United States itself. Regarding the US trade deficit with the European Union, it should be borne in mind that this is compensated for by other components of the current account, particularly investment income. This is how the United States has actually recorded a consistent current account surplus with the European Union since 2009, according to official US statistics.
7 See, for example, Crucini and Davis (2016).
8 If the government passes on tariff revenue to domestic economic agents (in the form of tax cuts, for example), this effect is muted.
9 This is particularly true when the country imposing the tariffs is large and thus able to influence the world market price with its demand. Part of the tariff burden can then be passed on to the exporting country.
10 Appreciation can be the result of decreased demand for foreign currency owing to lower imports. It is equally conceivable for a tightening of monetary policy in response to stronger domestic price pressures to be accompanied by an appreciation of the currency.
11 See, inter alia, Helpman and Krugman (1985); Aghion et al. (2005). For a recent empirical study on this relationship, see Ahn et al. (2019).

Estimating long-run trade elasticities

When quantifying the consequences of trade policy measures, trade elasticities play an important role.[1] Elasticity represents the relative change of a variable in relation to the relative change in another variable. Trade (cost) elasticities thus measure how imports respond to a change in trade costs.[2] They are directly linked to elasticities of substitution between products from various countries of origin. If trade elasticities are high, a rise in trade costs between two countries drives up volume effects considerably, for one, as demand focuses more closely on domestic products or products from third countries.

Various methods can be used to estimate trade elasticities. Macroeconomic models, which are generally used to examine adjustments of macroeconomic variables to temporary shocks in the short to medium term, often yield relatively low values for trade elasticities. In more detailed trade models that investigate the impact of long-term political measures, such as free trade agreements, elasticities are usually significantly higher.[3] This is possibly because the options for substituting products are greater over the long term and among related products than over the short term and among broad product categories.

Structural gravity models, in particular, are used to estimate long-run trade elasticities.[4] These approaches model bilateral trade between two countries while focusing on various determinants, such as the gross domestic product of each trading partner as well as trading costs, both between the two economies as well as vis-à-vis third countries. Such models provide estimation equations that correlate bilateral trade flows with tariffs and other – sometimes time-invariant – restrictions, such as geographical distance between countries and language barriers. This approach can also take trade agreements into account. As tariffs can be considered an essential exogenous determinant of trade costs, it is possible to use this method to estimate trade elasticities.

Applying such an approach to annual data on international and intra-national trade flows in the manufacturing sector in 45 countries reveals that, for the period from 1996 to 2015, the tariff variable has a highly significant negative impact on trade flows,[5] and trade elasticity is estimated at -5.[6]

As an alternative to this procedure, Feenstra (1994) developed an estimation approach based on a model with imperfect competition and product varieties distinguished by country of origin.[7] When applied to US for-

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1 Arkolakis et al. (2012), for instance, show that for important trade models – such as those in Krugman (1980), Eaton and Kortum (2002) and Melitz (2003) – the welfare implications of trade liberalisation (or its reversal) hinge on the degree of trade elasticity.
2 In the stricter sense, trade costs are import duties and transport costs, for instance. In the broadest sense, they cover all barriers that restrict international trade, such as communication and financing costs as well as organisational expenses.
3 See Anderson and Yotov (2017).
4 See Head and Mayer (2014).
5 Data on the manufacturing sector's trade ties are taken from the OECD's TiVA database; see https://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm. Data on tariffs come from the WITS database; see https://wits.worldbank.org.
6 The estimation is calculated using a Poisson pseudo maximum likelihood approach; see Santos Silva and Tenreyro (2006). The estimated equation also takes account of indicator variables for free trade agreements, customs unions and common currencies.
7 In addition to estimating the product-specific elasticity of import demand, the elasticity of export supply can also be quantified. The elasticities are derived as structural parameters from the estimated system of import and export equations. See Feenstra (1994). This approach was expanded by Broda and Weinstein (2006) and Soderbery (2018).

eign trade data for the period from 2000 to 2017,[8] this approach yields an average trade elasticity of just under -5, which corroborates the result obtained using the gravity model. The average trade elasticity for more disparate products amounts to -3½ and is thus much lower than for homogeneous goods such as commodities.

Overall, it can be demonstrated that the long-run trade elasticities are typically rather high. This implies that, over the long term, trade flows respond significantly to changes in trade costs. In the short term, however, this applies to a limited extent only. It would thus appear that the full impact of the sharp rise in bilateral trade costs in the trade dispute between the United States and China is yet to come.

8 Elasticities were estimated based on Broda and Weinstein's (2006) approach. The estimate used data on US imports of around 5,000 products (HS six-digit codes) and from more than 150 countries. Data source: UN Comtrade; see https://comtrade.un.org. To ensure that the estimations are as reliable as possible, a product has to have been traded for at least five years and imported from at least five countries.

ition, it is unlikely that the current account will see a sustained improvement, as additional tariffs also negatively affect a country's own exports.

Third countries also adversely affected

The adverse effects of an all-out trade conflict can easily extend beyond the countries directly involved. Although it is conceivable that some countries could benefit from trade diversion effects, most are likely to be hit, at least in the short to medium term, by decreased demand from the warring factions as a result of the trade dispute. Added to this is the fact that protectionist measures may increase economic uncertainty (see the box on pp. 57 ff.). This may cause enterprises to postpone their investment plans. Furthermore, global financing conditions may deteriorate on account of heightened uncertainty.

Effects of US trade policy measures to date

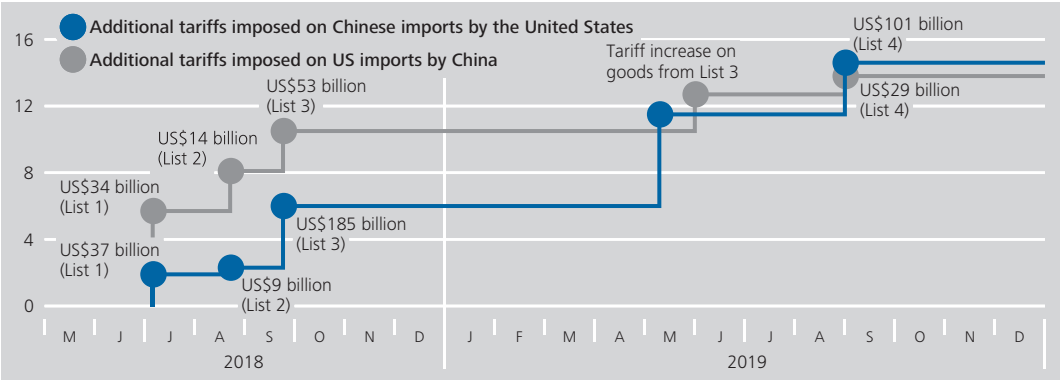
Trade dispute with China

Stages of escalation of the trade dispute

The US-China trade dispute has escalated in stages over the past one and a half years. Initially, the United States only imposed additional tariffs on a small proportion of Chinese goods, to which China responded with countermeasures. As the dispute escalated, both countries extended the imposition of tariffs to an ever greater share of each other's imports or increased the tariff rates on goods already subject to tariffs. While the US tariffs targeted intermediate and capital goods from China, China's tariffs were focused primarily on capital goods and commodities. By the end of 2019, additional tariffs had been imposed on around two-thirds of the total volume of goods traded between the United States and China. In January 2020, both countries signed a "phase one"

Stages of the trade dispute between the United States and China

Average additional tariffs imposed on each other's goods imports as a percentage of import value and the volume of imports affected[1]



Sources: Peterson Institute for International Economics (PIIE), U.S. Census Bureau and Bundesbank calculations. **1** Based on PIIE's tariff lists as well as product-specific import values from 2017, which are also used for weighting. Data on the affected import values may deviate from those communicated by the US and Chinese governments. Temporary suspensions of tariffs on specific products (e.g. by China on American motor vehicles in January 2019) are not considered here.

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agreement to ease the trade dispute.[12] However, the majority of the tariffs imposed will remain in force until further notice.

Considerable decline in trade between United States and China

The trade flows between China and the United States have declined considerably since the onset of the trade dispute. After seasonal adjustment, the value of US imports of goods from China at the end of 2019 was more than one-fifth lower than it had been prior to the imposition of the first additional tariffs.[13] US exports to China, the volume of which is admittedly considerably lower, experienced a similar decline. The US trade deficit with China decreased to some extent. Nevertheless, its overall current account deficit relative to gross domestic product (GDP) in the third quarter of 2019 was exactly the same as at the start of 2018.[14]

Analysis of effect of tariffs at detailed product level

In order to identify the effects of the additional tariffs on US imports from China as precisely as possible, a detailed breakdown of trade flows into product groups is analysed.[15] On this basis, imports subject to additional tariffs are analysed to determine whether they developed at a different rate to the remaining goods imports from China.[16] The difference-in-differences method is a suitable analytical framework for this purpose. Within this framework, the monthly year-on-year growth rate of the product-specific import value is regressed, inter alia, on an indicator variable that switches from zero to one in the month from which additional tariffs are imposed on a product.[17]

Decline in US imports from China mainly due to additional tariffs

The findings suggest that the decline in US imports from China since the onset of the trade dispute is mainly attributable to the introduction of the additional tariffs. The value of imports of goods subject to additional tariffs declined sharply between July 2018 and May

12 Notably, the trade agreement contains China's commitment to importing a considerably greater volume of US goods and services in future. In addition, China pledges to better protect intellectual property rights and to refrain from currency manipulation.

13 Comparison of September to November 2019 with Q1 2018.

14 The more expansionary stance of US fiscal policy is also likely to have contributed to this. See, inter alia, Deutsche Bundesbank (2018a).

15 The disaggregation is based on the classification of goods in the Harmonized Commodity Description and Coding System (HS) at the six-digit level. The data source is the U.S. Census Bureau.

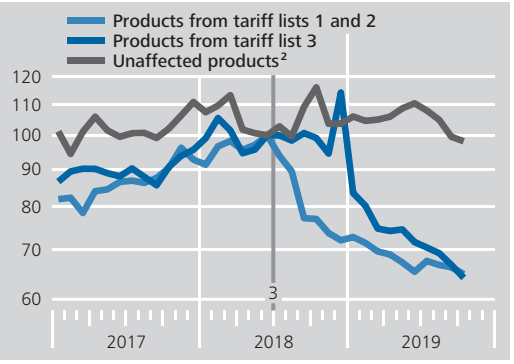
16 The tariff lists provided by the Peterson Institute for International Economics were used to identify the goods that are subject to additional tariffs. See Bown (2019).

17 The following equation is estimated: $\Delta IM_{p,t} = \beta * Tariff\text{-}Dummy_{p,t} + \gamma_p + \gamma_{st} + \epsilon_{p,t}$, where $\Delta IM_{p,t}$ represents the monthly year-on-year growth rate of US imports from China of product p at time t. $Tariff\text{-}Dummy_{p,t}$ is the indicator variable, γ_p is a product-specific effect and γ_{st} is a sector-time-specific fixed effect. When analysing price effects and trade diversion effects, the dependent variable is changed accordingly and further control variables are added to the model. All analyses cover the period from January 2016 to May 2019. For a more detailed description of the analysis, see Meinen et al. (2019).

2019, whilst other imports held up comparatively well. On average, the difference between the annual rates of change for these two groups of products during this period totalled around 30 percentage points. Taking into account the fact that the imports concerned were subject to additional tariffs of 13%, on average, this implies an elasticity of approximately -2. As estimates for the long term point to significantly greater elasticities (see the box on pp. 48 f.), this suggests that the adjustment was not yet complete, and that trade between the United States and China can be expected to continue declining if the additional tariffs remain in place.[18]

US goods imports from China*

June 2018 = 100, seasonally adjusted,[1] log scale



Sources: U.S. Census Bureau, Peterson Institute for International Economics and Bundesbank calculations. * Import values in US dollars. **1** Seasonally adjusted by the Bundesbank. **2** Also includes products from tariff list 4 (which did not come into effect until September 2019). **3** First additional tariffs imposed.
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US enterprises and consumers appear to be bearing brunt of tariffs

A similar approach can be used to investigate whether Chinese suppliers of products subject to additional tariffs were prepared to make price concessions to the United States. To examine this, developments in the prices at the customs border of such US imports – i.e. before any extra tariffs were applied – were compared with those of other imports from China.[19] The results do not point to any systematic differences.[20] This indicates that the (gross) prices of the goods subject to additional tariffs in the United States probably rose, or that importers had to accept smaller margins. Therefore, as already suggested by the decline in US imports from China, the brunt of the tariffs has been borne to a very large extent by US enterprises and consumers – at least until May 2019.

Additional tariffs amplified inflation in United States

This is consistent with the fact that the sub-indices in the US consumer price index (CPI) that were most affected by the additional tariffs on consumer goods imports have shown relatively sharp increases in recent times.[21] However, since these sub-indices are only a small component of the CPI, the direct impact on the headline inflation rate was moderate.[22] Nonetheless, the additional tariffs primarily affected intermediate goods. There could therefore have been other price effects that are less easy to identify.

No evidence of systematic trade diversion effects

Using the difference-in-differences method, we can also investigate whether the imports from China subject to additional tariffs have been substituted by imports from third countries. To do so, we analyse whether US imports from third countries of products subject to additional tariffs in trade with China showed a different trend to other imports from these countries.[23] The results of our estimations indicate that this was not systematically the case – at least not in

18 Amiti et al. (2020) show that the quantitative reaction of imports to additional tariffs has increased over time.
19 Given a lack of "real" price data, unit values have been used instead. These are calculated as the ratio of trading values to the quantities (measured by item or weight) and can be used as a rough proxy for prices.
20 This finding is consistent with the results of other empirical studies; see, for instance, Amiti et al. (2019); Cavallo et al. (2019); Fajgelbaum et al. (2020).
21 The CPI components taken into account are those for which consumer goods imports from China subject to additional tariffs account for comparatively large proportions of the basket of goods in question. The specific items are: "misc. personal goods", "floor coverings", "living room, kitchen and dining room furniture", "other furniture", "other appliances", "clocks, lamps and decorator items", "dishes and flatware", "nonelectric cookware & tableware" and "sports vehicles including bicycles".
22 Together, the affected groups of goods have a weight of 1½% in the US consumer price index. In November 2019, the annual growth rate of this sub-index was up 5 percentage points on its long-term average. The direct impact of the tariffs on the headline CPI rate during this period was therefore probably roughly 0.1 percentage point.
23 The analysis included the 29 most important third countries which, together with China, account for the bulk of US imports.

Domestic economic effects of import tariffs with regard to global value chains

The expansion of cross-border value chains has played a key role in the intensification of international trade over the past few decades.[1] The fact that stages of production are increasingly being distributed across a range of different countries has become apparent in the growing co-movement of imports and exports and in the declining share of domestic value added in exports, as well as in the rising percentage of goods that cross borders several times over.[2]

Given the existing tendencies towards a more restrictive trade policy, there arises the question of how the international interlinking of production stages influences the domestic transmission of changes in trading costs. In addition to econometric approaches, macroeconomic structural models, such as dynamic stochastic general equilibrium (DSGE) models, can be used as an analytical framework when studying this.[3] For the sake of simplicity and easier handling, commonly used DSGE models dispense with value added chains.[4] Various more recent papers show, however, that modelling cross-border production chains in DSGE models of open economies has major implications.[5] This is also true with regard to the effects of tariffs. The transmission channels through which tariffs influence prices and demand differ markedly in the case of goods for private consumption and intermediate goods.

This can be shown in a New Keynesian two-country DSGE model of open economies. In this model, cross-border production chains are modelled using trade in intermediate goods,[6] which involves comparing two scenarios. In the first scenario, an increase in the tariff rate on imports of consumer goods by 10 percentage points is assumed, while, in the second scenario, a hike by the same amount in tariffs on the value of imported intermediate goods is implied.

In the case of tariffs on consumer goods, the model shows the consumer price index initially increasing roughly in proportion with the share of imports in the underlying basket of goods. Owing to the relative increase in cost of foreign goods, households shift their consumption to domestic products. Additional positive knock-on effects on domestic output are produced as a result of increased demand for intermediate

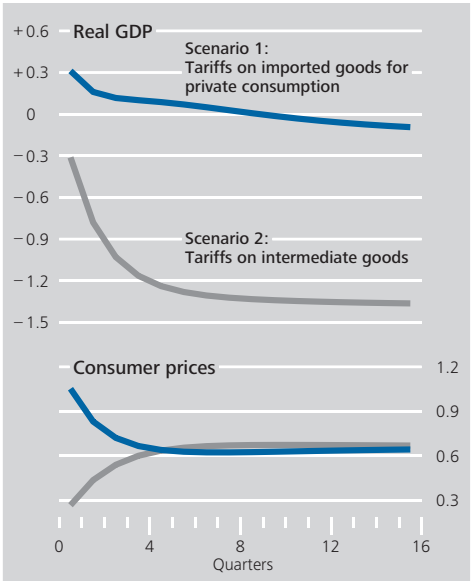
1 According to Baldwin (2013), this development was originally due to the large wage differentials between industrial countries and emerging economies combined with a decline in transport costs. Furthermore, technological advances in the information and communications sector have opened up new possibilities of steering production over long distances and – in the case of services, too – making greater use of the advantages of the international division of labour.
2 See Johnson and Noguera (2017); European Central Bank (2019a); Ignatenko et al. (2019) and Georgiadis et al. (2020).
3 DSGE models are especially suitable for analysing the short and medium-term effects of exogenous non-anticipated disruptions. In the case of trade policy measures, long-term dislocations may also occur, however – owing to a permanent shortening of production chains, for example. These are not investigated here.
4 See Deutsche Bundesbank (2017); Barattieri et al. (2018) and Lindé and Pescatori (2019). One exception to be mentioned is the analysis by Imura (2019) which investigates the effects of import duties in a DSGE model with cross-border value chains and multinational enterprises.
5 See de Soyres and Gaillard (2019); Rodnyansky (2019); Gopinath et al. (2020) and Georgiadis et al. (2020).
6 This is an extension of the two-country model in Georgiadis et al. (2020). The extension comprises persistent tariffs which are added directly to import prices, thus making the imported goods more expensive. The customs receipts are distributed to households. In the long term, the intensity of trade is determined by residents' preference for domestic non-durable goods and intermediate goods. On a long-term average, imports as a percentage of total consumption correspond to 15% in each category of goods. Exports are invoiced in the national currency of the buyer country. Nominal wages are adjusted on average once a year; producer prices are adjusted on average twice a year. In the case of consumer goods, a substitution elasticity of 1.5 is assumed between domestic and foreign products with a corresponding figure of 0.8 for intermediate goods.

goods. This is counteracted by reduced foreign demand resulting from the appreciation of the domestic currency.[7] The central bank of the country in question also tightens its monetary policy, which dampens economic activity. Overall, the import tariff nevertheless stimulates domestic production in the short term. In the medium term, however, there is a slight decline in gross domestic product. The initially marked rise in consumer prices eases over time. Besides tighter monetary policy, appreciation plays a major role, as intermediate goods imports become cheaper as a result and this, in turn, lowers producer prices.

If tariffs are raised on foreign intermediate goods instead, production costs rise at first in line with the share of imports used. This causes domestic producers to increase their prices. This direct effect becomes stronger in the domestic production network, as some of the goods are used as inputs in the country's downstream stages of production.[8] An appreciation of the home currency also means that domestic products become more expensive for households and enterprises abroad. Domestic households shift a certain amount of their consumption to non-tariff imported goods, which become cheaper as a result of this appreciation. Overall, there is thus a decline in demand both at home and abroad for domestically produced goods. It is true that, owing to import tariffs, fewer intermediate goods are imported and domestic goods are used instead. This does not offset the decline in demand, however.[9] Domestic economic output thus shows a perceptible decline compared with the baseline without tariffs. Although slow price adjustments mean that consumer prices are not directly affected by import tariffs on intermediate goods, the increase in producer prices is also reflected over the medium term in a higher consumer price index.

Domestic economic effects of an increase in import tariffs by different categories of goods*

Percentage deviation from steady state



* Impulse response of gross domestic product (GDP) and of domestic consumer prices to a unilateral increase in import tariffs of 10 percentage points illustrated using a New Keynesian two-country DSGE model with cross-border production chains.

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The restrictive trade policy measures adopted recently by the United States are directed in particular at intermediate goods. The presented simulation results suggest, however, that tariffs on such products pro-

7 Appreciation of the domestic currency due to import tariffs is a typical finding in the literature; see Deutsche Bundesbank (2017); Barattieri et al. (2018); Lindé and Pescatori (2019) and Furceri et al. (2019). Owing to higher inflation, there is a monetary policy tightening in the DSGE model and, as a result, a larger interest rate differential between home and abroad, which strengthens the domestic currency.

8 A rise in producer prices as a result of import tariffs may also be found in empirical analyses, say, in Amiti et al. (2019).

9 A similar outcome is documented by Barattieri and Cacciatore (2019) with regard to the US labour market. Accordingly, owing to a diversion to domestic production in some sectors, temporary trade barriers may lead to a short-lived rise in employment, while downstream sectors, in particular, suffer marked employment losses. The timing of this decline in employment follows a rise in the prices of intermediate and finished goods, suggesting a connection. In line with this, another study provides some indications that there is a drop in downstream industrial output at the sectoral level following an increase in tariffs on imported intermediate goods. See European Central Bank (2019b).

duce significantly less favourable real economic effects than do tariffs on finished goods.[10] The likely intention behind introducing tariffs on intermediate goods is to repatriate the production of such goods. It is true that the model framework selected here does not allow any investigation of changes in international structures of production. Studies suggest, however, that such adjustments are often difficult to implement and sometimes protracted because of the intricately interlinked way in which production networks are organised.[11]

10 Imura (2019) arrives at similar results in a two-country model; along with cross-border links in the production process, this also captures capital accumulation and the endogenous entry and exit of enterprises.
11 See Bayoumi et al. (2019).

the period analysed here (up to May 2019).[24] Trade diversion effects were identified only for individual countries or product categories.[25] This suggests that US enterprises struggled to find alternative suppliers outside China at short notice.

Tariffs do not appear to be benefiting US industry, either

Dwindling US imports from China do not appear to have been replaced by domestically produced goods, either. The production of goods in the United States that are subject to additional tariffs when imported from China did not develop differently from that of other products, at any rate.[26] In both cases, the previously brisk upsurge tailed off at around the time at which the first restrictive measures to trade with China were applied. Although this may also be due to other reasons, it does not suggest that the additional tariffs have bolstered the US industrial sector.[27] Instead, the tariffs have probably made the use of Chinese intermediate goods, and thus the production of final products, more expensive.[28]

NiGEM simulations …

The evidence available therefore suggests that US consumers have been burdened by the additional tariffs imposed by China and that US in-

24 The additional tariffs have not resulted in any systematic diversion effects for China's imports yet, either. Only for a few products, such as soybeans, did countries like Brazil step up their exports to China for a while. See European Central Bank (2019c).
25 Taiwan, for instance, seems to have been able to replace China in supplying certain electronic products. What also stands out is the very sharp rise in US imports of goods from Vietnam more recently. However, this also applies to products unaffected by additional tariffs when imported from China.
26 The analysis was carried out at the industrial sector level (4-digit NAICS codes). The sectors were defined according to whether or not the output of a given sector was below average in relation to imports from China subject to tariffs from the same sector in the period from July 2017 to June 2018.
27 Flaaen and Pierce (2019) empirically analyse the impact of the additional tariffs imposed by the United States during 2018 (not only on China) and the corresponding countermeasures taken by its trading partners. The authors are unable to provide evidence of a statistically significant effect on US industrial production (in either direction). They do, however, identify a negative impact on employment in the US industrial sector.
28 Chinese intermediate goods are not insignificant for the US manufacturing sector, accounting for 2½% of overall output.

dustry has not benefited from them. To gain a rough estimate of the macroeconomic effects of the trade disputes, we used the NiGEM global economic model.[29] In keeping with the empirical findings, the simulations assumed that raising tariffs directly raises the domestic price of foreign products.[30] It was also assumed that tariff revenue is transferred to households.[31]

… suggest substantial GDP losses for United States and China

According to the simulations, protectionist measures on both sides slowed economic growth in the United States and China slightly over the past two years. In the medium term, if the additional tariffs imposed to date were maintained, real GDP in the United States would be 0.5% lower than in an alternative scenario without additional tariffs. The losses for China are of a similar magnitude. The additional tariffs drive up the inflation rate in the United States by as much as 0.3 percentage point, although in the model, the US Federal Reserve responds to rising cost pressures by tightening its monetary policy.

Negative effects for third countries

The simulations show mostly negative effects for third countries, too, although these are very minor. These effects stem from the fact that weaker economic growth in the United States and China dampens demand for imports from

US consumer prices for selected groups of goods

Year-on-year percentage change

Sources: Bureau of Labor Statistics, Peterson Institute for International Economics and Bundesbank calculations. **1** Includes the following groups of goods: "misc. personal goods", "floor coverings", "living room, kitchen and dining room furniture", "other furniture", "other appliances", "clocks, lamps and decorator items", "dishes and flatware", "nonelectric cookware & tableware" and "sports vehicles including bicycles". **2** Includes all other groups of goods (excluding food and energy). **3** First additional tariffs imposed.

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US industrial production for selected sectors*

June 2018 = 100, seasonally adjusted, log scale

Sources: Board of Governors of the Federal Reserve System, Peterson Institute for International Economics and Bundesbank calculations. * Defined according to whether or not the output of a given sector was below average in relation to imports from China subject to tariffs from the same sector in the period from July 2017 to June 2018. **1** First additional tariffs imposed.

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29 NiGEM is the global economic model developed by the UK-based National Institute of Economic and Social Research (NIESR). It models economic interconnectedness between over 60 economies and regions via foreign trade and the interest rate-exchange rate nexus. The model has New Keynesian features, especially forward-looking elements on the financial and labour markets. The expanded "US Tariff & BREXIT" version makes it possible to analyse trade policy measures. For further information, see https://nimodel.niesr.ac.uk

30 For an in-depth description of the simulation approach, see Deutsche Bundesbank (2018b). The scenario involving the trade dispute between the United States and China analysed there has been expanded here to include the tariff increases that have since been brought in.

31 On an annualised basis, in recent months (up to November 2019), the United States did actually record additional tariff revenue of around US$40 billion compared to 2017. Of this, US$16 billion alone was funnelled into an aid package for American farmers, who are bearing the brunt of China's retaliatory measures.

other countries.[32] According to the simulation, Germany's real GDP would lag behind by 0.1% in 2023 compared to the alternative scenario. In the same year, global GDP would be squeezed by roughly 0.3% and world trade by around 1%.

Even greater aggregate losses possible, particularly as a result of uncertainty effects

In fact, the aggregate losses for the United States and China, as well as third countries, could be even larger than those shown by the NiGEM model. Most notably, the simulations did not factor in uncertainty effects.[33] However, there are indications that uncertainty surrounding economic policy has risen worldwide in connection with the US-China trade dispute. Trade policy uncertainty and its repercussions are difficult to identify, though (see the box on pp. 57 ff.). Moreover, NiGEM does not model sectoral developments or interconnectedness via cross-border value chains. This means, in particular, that the aforementioned potential losses for US industry resulting from tariffs in downstream production stages cannot be recorded directly.

Measures against other trading partners

Tariffs on solar panels, washing machines, steel and aluminium …

Over the past two years, the United States has toughened its trade policy towards other countries, too. At the start of 2018, prompted by the country's industrial sector, the US Administration imposed safeguard tariffs on imported solar panels and washing machines.[34] According to the Peterson Institute for International Economics, they cover a goods value totalling approximately US$10 billion per year. Besides this, starting in the second quarter of 2018, the United States imposed additional tariffs on imports of steel and aluminium, justifying the measure on the grounds of national security.[35] This temporarily affected goods to the value of US$41 billion.[36]

… are likely to have been of very little economic benefit to United States

As was the case with the measures imposed exclusively on China, these tariffs are unlikely to have yielded the macroeconomic benefits that the United States had hoped for. According to one case study, the tariffs on washing machines led to a small rise in employment with domestic producers. However, because consumer prices for washing machines increased perceptibly at the same time, the cost-benefit ratio turned out to be rather unfavourable.[37] Other studies indicate that the US tariffs on steel also created a number of jobs in the US steel industry. Nonetheless, these additional jobs were apparently offset by far larger employment losses in the industries downstream, which were hit by competitive disadvantages from the higher price of steel products as a result of the tariffs.[38]

Retaliatory tariffs imposed by European Union

A number of trading partners, including the European Union, have fought back against the additional tariffs imposed by the United States on steel and aluminium. From the point of view of the European Union, these are safeguard tariffs which – at least in part – are not justifiable. The European Union therefore retaliated by imposing additional tariffs on a range of imports from the United States in July 2018. These tariffs cover approximately US$3.5 billion worth of products, which is equivalent to around half the value of exports of steel and aluminium to the United States. Steel and aluminium also ac-

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32 By contrast, other model studies already assume considerable trade diversion effects in the short term, which more than offset the negative effects stemming from the decline in economic growth in the United States and China. See Bolt et al. (2019); International Monetary Fund (2018).
33 To factor in potential negative effects of greater uncertainty, ad hoc assumptions are made in various simulation studies. See, inter alia, International Monetary Fund (2019).
34 The legal basis for these tariffs is Section 201 of the Trade Act of 1974. As safeguards, the tariffs are generally permitted under WTO rules. They are limited to four years for solar panels and three years for washing machines.
35 The legal basis for these tariffs is Section 232 of the Trade Expansion Act of 1962. Under WTO rules, Article XXI of the General Agreement on Tariffs and Trade (GATT) permits, in principle, interventions for the purpose of protecting national security.
36 Mexico and Canada are now exempt from the tariffs after the United States negotiated a new free trade agreement with both countries. This reduced the value of goods affected to US$26 billion.
37 The higher prices appear to have resulted in additional costs of US$1.5 billion for US consumers. This stood in contrast to the creation or retention of roughly just 1,800 jobs. In statistical terms, this equated to costs of just over US$800,000 per job. See Flaaen et al. (2019).
38 See Francois and Baughman (2018); Hufbauer and Jung (2018).

The impact of trade policy uncertainty

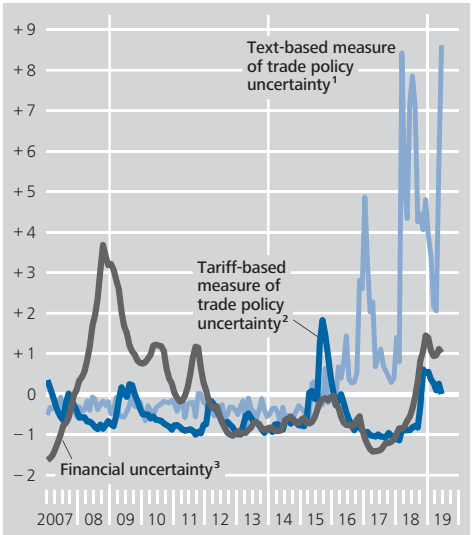
Against the backdrop of the current trade conflicts, there arises the question of the economic implications of heightened trade policy uncertainty. In this respect, uncertainty is cited as one factor behind the sluggish pace of global investment.[1] Related analyses, however, are faced with the problem that there is no generally accepted measure of trade policy uncertainty. From a conceptual point of view, the few indicators differ considerably from one another in some cases.

A commonly used indicator of trade policy uncertainty uses text analyses to measure how often this topic is mentioned in national newspapers.[2] Nevertheless, it is questionable how far this measure really reflects uncertainty, i.e. the limited predictability of future developments, and not simply the popularity of this topic.[3] An alternative approach attempts to derive trade policy uncertainty from the non-forecastable component of effective import tariff rates.[4] However, this measure captures only uncertainty resulting from implemented policies. Announcements or threats of trade policy interventions are not taken into account.[5] For the United States, both the text-based and the tariff-based indicators of trade policy uncertainty show elevated levels at the current juncture that range from significantly above-average to very high.

The macroeconomic impact of an unexpected increase in uncertainty can be analysed using structural vector autoregressive models (SVARs). In an initial analysis, bivariate models, each comprising one uncertainty indicator and US capital goods pro-

Indicators of trade policy uncertainty in the United States*

monthly, standardised



Sources: Caldara et al. (2020), Ludvigson et al. (2020) and Bundesbank calculations based on data from Haver Analytics. * A rise (fall) in the standardised indicators implies an increase (decrease) in uncertainty. **1** Based on text analyses of daily newspapers. **2** Based on the volatility of the residual derived from an estimation of the dynamics of the effective US import tariff rate. **3** Based on the volatility of forecast errors of a large number of financial market variables.

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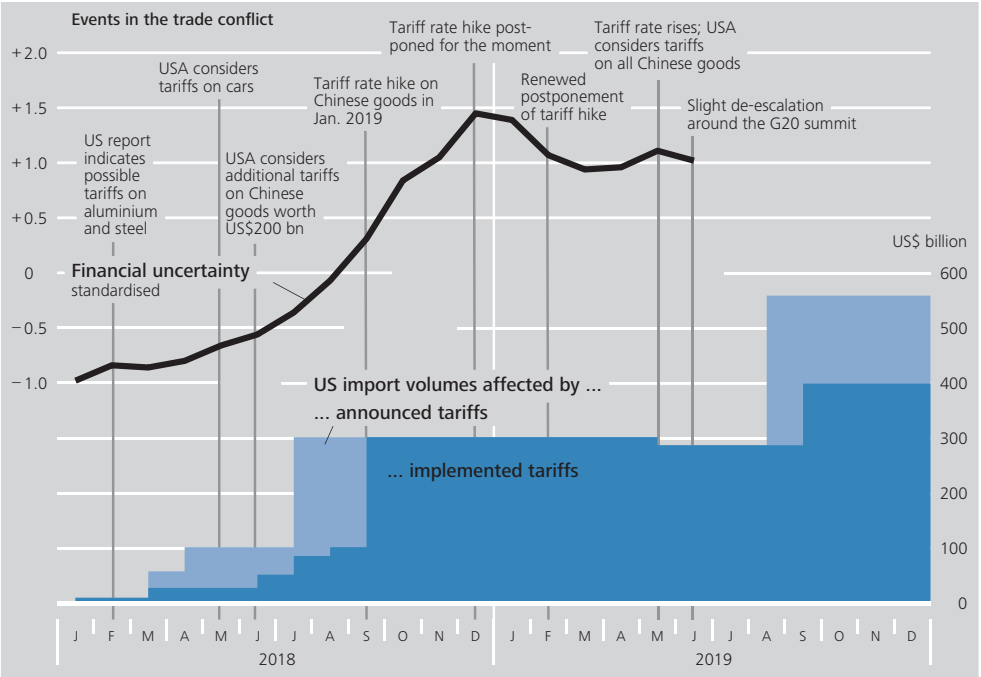
1 Uncertainty is often said to have a dampening effect on investment. For potential transmission channels and effects of uncertainty, see Deutsche Bundesbank (2018c).
2 See Caldara et al. (2020). For a comparable measurement approach, see Ahir et al. (2019).
3 Uncertainty is typically defined as the conditional volatility of unpredictable disturbances; see Jurado et al. (2015). Thus, uncertainty differs from risk – in which case probabilities can be assigned to a set of potential outcomes (see Knight (1921)) – and surprises in the form of expectation errors (see Scotti (2016)).
4 To calculate this indicator, a stochastic volatility model of the effective US import tariff rate is estimated on a monthly basis by applying the particle filter approach suggested by Born and Pfeifer (2014). The volatility of the non-predictable components of the effective import tariff rate is then interpreted as a measure of trade policy uncertainty. See Caldara et al. (2020).
5 Furthermore, the underlying effective import tariff rate is calculated as the ratio of customs duties to imports. This measure can therefore also be influenced by changes in the composition of imports, which represents an additional drawback.

Financial uncertainty and trade policy measures in the United States

monthly



Sources: Ludvigson et al. (2020), Peterson Institute for International Economics and Bundesbank calculations. The financial uncertainty indicator is currently available only up to June 2019.

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duction, are estimated on a monthly basis.[6] The derived impulse responses, however, show no clear effect of trade policy uncertainty on the real economy for either of the previously presented measures.[7]

What should be taken into account, however, is that the applied indicators might capture trade policy uncertainty less than adequately owing to the described conceptual shortcomings. For this reason, an indirect approach is also considered here. A number of analyses show that trade conflicts can trigger noticeable responses on financial markets.[8] Thus, it appears reasonable that an indicator of financial uncertainty which reflects the volatility of the non-predictable components of a large number of financial market variables,[9] will also capture – besides other factors – trade policy uncertainty.

6 The structural disturbances (shocks) are identified with a recursive identification scheme. The latter assumes a direct impact of uncertainty shocks on capital goods production, while the respective measure of uncertainty responds to investment-specific shocks with the lag of one period. See Bachmann et al. (2013); Scotti (2016); and Meinen and Röhe (2017). The models are estimated on a monthly basis. While the assumption of a one-period lagged shock impact seems reasonable for monthly data, this would be more difficult when using time series with a lower frequency (such as quarterly data).

7 In the impulse-response analysis, the SVAR system is hit once by a structural shock of one standard deviation. The impulse-response function shows the response of the model variables to this unexpected impulse over time. The analysis is based on models estimated using Bayesian techniques. The maximum time lag with which the endogenous variables enter the SVAR model is 12 periods. The models additionally contain a constant and a linear trend.

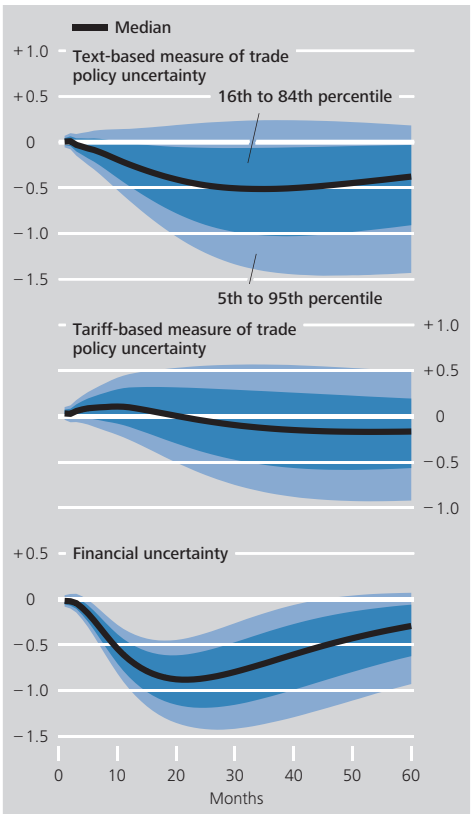
8 See, for example, Baker et al. (2019a); and Baker et al. (2019b).

9 The indicator for the United States is provided by Ludvigson et al. (2020). For its calculation, a factor model is used in a first step to determine the predictable components of financial market series. On the basis of the resulting forecast errors, uncertainty is calculated as the conditional volatility of the forecast errors using a stochastic volatility model.

For the United States, such an indicator of financial uncertainty does indeed show a remarkable co-movement with various escalation steps in the current trade conflicts. Recently, the indicator has displayed an above-average level. In particular, financial uncertainty increased noticeably earlier and more strongly compared with the tariff-based measure of uncertainty. This could have been the consequence of threats and announcements preceding the protectionist measures. If the measure of trade policy uncertainty is replaced by the indicator of financial uncertainty in the bivariate SVAR model, the results now show a clearly significant, negative impact of an unexpected increase in uncertainty on US capital goods production.

A more careful assessment of the impact of financial uncertainty requires additional variables to be included in the model in order to control for other factors. Moreover, capital goods production approximates aggregate investment only to a limited extent. For this reason, a multivariate SVAR model on the basis of monthly data is used in a first step to identify financial uncertainty shocks.[10] Subsequently, the quarterly growth rate of US gross fixed capital formation is regressed on the financial uncertainty shocks and their lags.[11] The derived impulse responses show a statistically significant negative impact of financial uncertainty shocks on aggregate investment in the United States.[12] It is nevertheless noteworthy that uncertainty on financial markets may be caused by multiple factors and that trade conflicts are merely one possible trigger. If, however, trade tensions – as suggested by the evolution of the time series – have recently caused increased uncertainty on the financial markets, the esti-

Impact of an uncertainty shock on capital goods production in the United States*



* Impulse-responses of capital goods production to contractionary uncertainty shocks of one standard deviation, derived from bivariate SVAR models estimated with Bayesian methods. The estimation periods span the periods from January 1982 to June 2019 (tariff-based trade policy uncertainty shock) and from July 1960 to June 2019 (text-based trade policy uncertainty shock and financial uncertainty shock).

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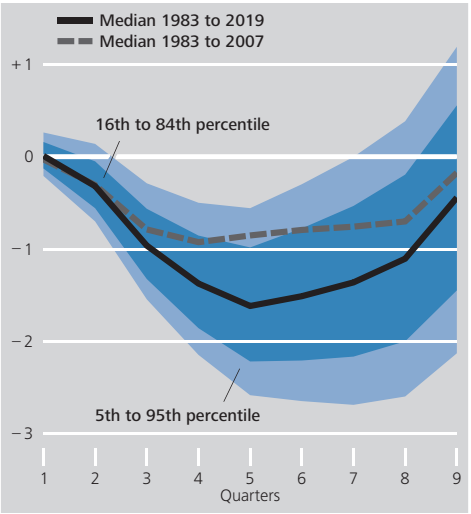
10 The bivariate model is extended by an indicator of macroeconomic uncertainty (see Jurado et al (2015)), the S&P 500 equity price index, a shadow short rate (see Krippner (2013)), the effective US import tariff rate and industrial production net of capital goods production. The index of macroeconomic uncertainty is based on the volatility of forecast errors of a large number of relevant business cycle time series. The shadow interest rate measures the degree of monetary policy accommodation when the policy rate is at the zero lower bound and otherwise corresponds to the short-term interest rate. The estimation approach is equivalent to that of the bivariate model and assumes an immediate effect of financial uncertainty shocks on all other variables in the model.

11 In the second stage, the identified shocks are first converted into a quarterly frequency. The subsequent estimation assumes a maximum lag of eight periods. For a detailed description of the two-stage methodology, see, inter alia, Kilian (2009).

12 The effect is driven not only by the global financial crisis. Estimating the model for a restricted sample period from January 1982 to December 2008 confirms the significantly negative impact.

Impact of a financial uncertainty shock on gross fixed capital formation in the United States*



* Impulse-response of gross fixed capital formation to a contractionary financial uncertainty shock of one standard deviation. The estimation periods span the period from 1983 Q1 to 2019 Q2 and 2007 Q4 respectively; the credibility bands pertain to the estimation period up to 2019. The underlying structural shocks were indentified with a recursive identification scheme in a multivariate SVAR model estimated with Bayesian methods on a monthly basis.

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mation results presented here point – at least for the United States – to trade policy uncertainty as one factor behind the subdued investment dynamics.[13]

13 Further likely factors behind the weak US investment growth were specific problems in individual key industries (such as energy and aircraft construction), the phasing out of fiscal stimuli, low profit margins as well as the general slowdown in global economic activity.

count for one-third of the imports affected by the retaliatory tariffs, with the rest divided fairly evenly between agricultural products and consumer goods.[39]

Potential tariffs on EU vehicle exports …

Relative to total trade in goods between the United States and the European Union, which amounts to just over US$800 billion, the share of goods affected by additional tariffs remains very low to date.[40] However, the United States has already repeatedly threatened to impose tariffs on a far greater scale. For instance, a study commissioned by the US Administration last February concluded that imports of motor vehicles and motor vehicle parts pose a threat to national security. This established a basis for safeguard tariffs, which, owing to exemptions for major trading partners, would primarily have burdened European manufacturers. The volume of goods potentially affected in the context of transatlantic trade amounts to roughly US$60 billion.

… could weigh on Germany's economy

Germany appears particularly vulnerable to protectionist measures of this kind because motor vehicles account for a significant part of its range of exports. However, simulations using NiGEM and the dynamic general equilibrium model EAGLE[41] indicate that at least the direct macroeconomic impact of the intended

39 When selecting the groups of goods affected, the European Union probably also focused on minimising the potential damage to its own economy. See Fetzer and Schwarz (2019).

40 This picture does not change even when factoring in the import tariffs imposed by the United States in the fourth quarter of 2019 on aircraft and certain consumer goods from the European Union totalling US$7.5 billion. This measure, approved by the WTO, is based on proceedings that have been underway for some time now regarding unauthorised subsidies for aircraft manufacturers. It is possible that the United States has not taken adequate measures to put an end to such subsidies, either. A WTO procedure concerning this matter is still ongoing.

41 The Euro Area and Global Economy (EAGLE) model is a calibrated dynamic general equilibrium model developed by Eurosystem experts to analyse the transmission of international shocks. It maps four regions of the world; in its present application, these are Germany, the euro area excluding Germany, the United States, and the rest of the world. For a detailed description of the model, see Gomes et al. (2012).

tariff hike of 25 percentage points would be modest for Germany. In a corresponding scenario, both models suggest medium-term GDP losses of less than 0.25% for Germany and the euro area as a whole.[42] Losses in the United States itself could be of a similar size.[43] If the magnifying effects of global value chains, the potential negative repercussions of heightened trade policy uncertainty and the countermeasures threatened by the European Union, which are not included in the models, are additionally taken into account, the negative effects felt by all of the abovementioned economies could be far more pronounced.[44]

Danger of all-out trade war between United States and Europe not ruled out

Against this backdrop, it is of little reassurance that the US Administration currently no longer appears to be pursuing its plan of imposing safeguard tariffs on motor vehicle imports for reasons of national security.[45] Nevertheless, European trade surpluses and trade barriers continue to be subject to criticism from the United States. As a result, it seems that there is still the possibility that the United States could charge additional tariffs on a wide range of European products.[46] This means that the danger of an all-out trade war between the United States and the European Union can probably not be entirely ruled out yet, either. However, such a conflict would cost both sides dearly. In a hypothetical scenario in which all tariffs in bilateral goods trade are raised by 25 percentage points, the European Union's GDP would, according to NiGEM simulations, be reduced by 1% over the medium term. The negative effects in the United States would be even more pronounced. Partly due to its close trade links with the European Union, the adverse repercussions for the US economy would be significantly more severe than those arising from the current conflict with China.

Summary

Overall, the findings indicate that the United States has so far been unable to benefit from its recent trade policy measures. Instead, it is likely that, as a result of the trade conflict with China, in particular, aggregate output in the United States has been somewhat dampened

US economy has so far seen no gains from more restrictive trade policy

Potential macroeconomic effects of current trade disputes according to NiGEM simulations*

Percentage deviations of real GDP from the baseline in the fifth year following the increase in tariffs

***** Bundesbank calculations based on the NIESR's "expanded US Tariff & BREXIT" model. Simulation assumptions: customs revenue used to lower income tax rates and monetary policy responses in line with standard rules. **1** Figures for 2023. **2** Assuming additional tariff of 25% and exceptions for Mexico and Canada. **3** Assuming bilateral general tariff increases of 25 percentage points.

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42 Other studies arrive at similar conclusions using computable general equilibrium models. See Felbermayr and Steininger (2019).

43 Both models agree that trade-restrictive measures therefore involve the risk of self-inflicted damage, even if no retaliatory measures are taken. In the simulations, this mainly stems from the fact that the inflationary effects of the higher tariffs, together with monetary policy tightening within the scope of the rules, places a strain on domestic demand in the United States. US export activity is also hit by the noticeable appreciation of the US dollar as well as the weaker economic activity experienced by the trading partners affected by the tariffs.

44 See European Central Bank (2019c); Dullien et al. (2019).

45 The US Administration initially offered its trading partners the option of conducting negotiations to avoid safeguard tariffs. A decision by the US President on whether to implement these tariffs had been expected for mid-November 2019, following the submission of a progress report on the state of the negotiations. With the expiration of the deadline, it is likely that there is no longer a basis for imposing tariffs on motor vehicles for reasons of national security.

46 In particular, it is conceivable that the United States could – similar to the case of China – attempt to justify measures aimed at the European Union on the grounds of "unfair" trade practices in the future.

and consumer price inflation has tended to rise. No notable positive effects on employment have been observed.

Third parties also likely to be hit by trade conflict between United States and China

Furthermore, the findings presented in this article suggest that, so far, no "lucky bystanders" have benefited from the trade conflict between the United States and China. The trade diversion effects seen thus far have been limited. Instead, the fact that economic growth has slowed in both the United States and China is likely to be of far greater significance. This is subduing their demand for imports from other countries and has presumably contributed to the current sluggishness in global trade. At the same time, the trade policy disputes are likely to have led to greater uncertainty worldwide, which is having an overall dampening effect on investment activity and the global economy.

WTO must be strengthened

In order to counter protectionist efforts, it would be necessary to strengthen the rules-based global trade system, with the WTO at its core. However, the WTO itself has come under fire as it will not be able to adequately meet the current challenges unless it adapts its rulebook. This concerns, for example, provisions to protect intellectual property as well as the way in which it deals with state-owned enterprises. In addition, the United States has criticised certain aspects of the WTO's dispute settlement system.[47] For this reason, the United States has been blocking the nomination of new judges to the WTO Appellate Body for some time now, meaning that, since mid-December 2019, it has been unable to issue new rulings.[48] If the dispute settlement mechanism were to be permanently undermined, trade conflicts could play out in the open more frequently in future, potentially resulting in considerable damage to the global economy. To modernise the WTO, the European Union and other countries – jointly in some cases – have made proposals aimed at making processes more efficient, improving adherence to rules, and reforming the dispute settlement system.[49] However, the success of such an ambitious push for reform depends on the constructive participation of all WTO members.

Bilateral agreements cannot replace multilateral trade system

In recent years, and in part due to the failure of the latest major round of WTO trade negotiations (known as the Doha Round), many economies – including the European Union – have shifted the focus of their trade policy towards bilateral and regional agreements. These often go far beyond the regulations agreed upon within the scope of general WTO agreements. Under ideal circumstances, they would complement the WTO agreements. However, they are only an imperfect substitute for a functioning multilateral order.

47 The United States has accused the WTO Appellate Body of becoming politicised, overstepping its mandate, and issuing discriminatory rulings.
48 Some countries have agreed to conduct arbitration proceedings in bilateral disputes before external panels under similar rules. However, solutions such as this cannot replace the existing procedure as long as only selected trading parties are involved.
49 See, for example, European Commission (2018).

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