Gabriel Felbermayr, Marina Steininger and Erdal Yalcin

Quantifying Trump: The Costs of a Protectionist US

Gabriel Felbermayr
ifo Institute

Marina Steininger
ifo Institute

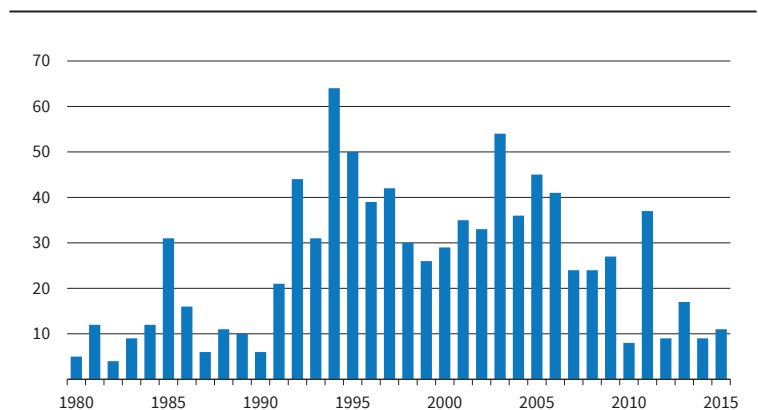Erdal Yalcin
ifo Institute

INTRODUCTION

With the inauguration of the new US-president protectionism in the world of international trade reached a new level. The United States of America is currently the world's largest single market, in which the US citizens earn one of the highest worldwide per capita incomes of 58,000 US dollars. Due to its economic size, economic policy measures, in particular trade policies, have a far-reaching impact on global economic developments. The consequences of a protectionist US trade policy may not only be limited to economic dimensions, but can also have important political and social implications.

Against this background, this article quantifies the economic consequences of US protectionist trade aspirations. Our analysis focuses on trade policy scenarios, which have been communicated by the current US administration as potential new trade policies to date. We draw on the results of a recent study of the ifo Institute conducted on behalf of the Bertelsmann Foundation.[1] In the first simulation, a retraction from the North American Free Trade Agreement (NAFTA) is considered. The study then illustrates the potential consequences of a 'Border Tax Adjustment' (BTA) policy. Finally, further measures to protect the US market are simulated by presuming an increase in American duties. The study presents the robust quantitative results that can be expected if an increasingly protectionist US trade policy were to be implemented. The results are intended to contribute to decision-makers' and stakeholders' ability to critically assess the risks that such policies entail.

GROWING PROTECTIONISM

In the wake of the global financial crisis in 2008/09 and the resulting economic stagnation in the Post-Doha round within the World Trade Organisation (WTO), lead-

[1] Yalcin *et al.* (2017).

ing trading nations strived to conclude new regional trade agreements (RTA) to advance progress in global trade liberalization in individual regions. These agreements included the Transatlantic Trade and Investment Partnership (TTIP), aimed at improving economic relations between the EU and the United States, and the transpacific trade agreement between the United States and a multitude of Pacific-Pacific countries (Trans-Pacific Partnership – TPP). Prevailing literature suggests that free trade agreements lead to a reduction of tariffs and non-tariff barriers (such as the mutual recognition of product standards) – see e.g. Bergstrand *et al.* (2015). In the mid-1990s, 30 trade agreements were ratified each year. This rate fell to 26 during the financial crisis, and since 2011 the average amount of ratified FTAs has fallen to 10. At this point, it is important to mention that these new agreements are deeper and farther reaching than their predecessors and include, for example, public procurement, services and regulatory chapters.

The ratification of free trade agreements can help to foster growth through structural reforms, for example, which are needed in times when the competitiveness of the industrial countries is eroded, especially compared to that of advanced developing countries like China or India. Thwarting such initiatives may not be a good idea. The relative gridlock of the ratification of new trade agreements certainly cannot be compared to the rise of the protectionist era; but the data shows that the global trend towards explicit protectionist measures has been growing for several years. Trade protection measures, such as anti-dumping tariffs, tariffs, quotas, or other protective duties implemented for a certain number of product lines is a good indication. Admittedly, these measures are regulated through international trade laws and might even be justified, but they still occur in terms of protectionist aspirations. The share of product lines affected by such protective measures increased from approximately 0.5 percent in 1990 to 2.5 percent in 2015; in other words it more than doubled.

Figure 1

Number of FTAs Ratified since 1980
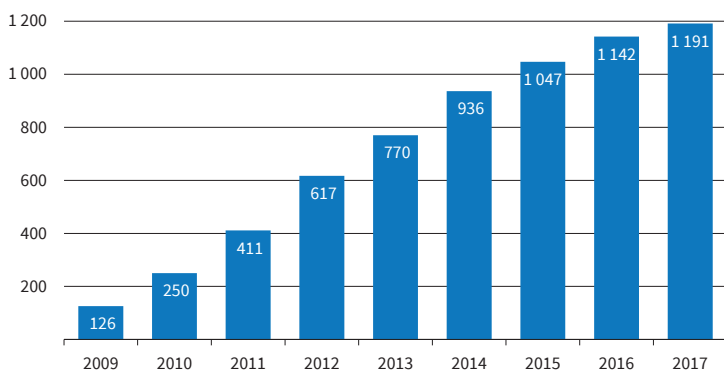

Source: WTO Regional Trade Agreements database.   © ifo Institute

Figure 2

Number of US Discriminatory Measures since 2009

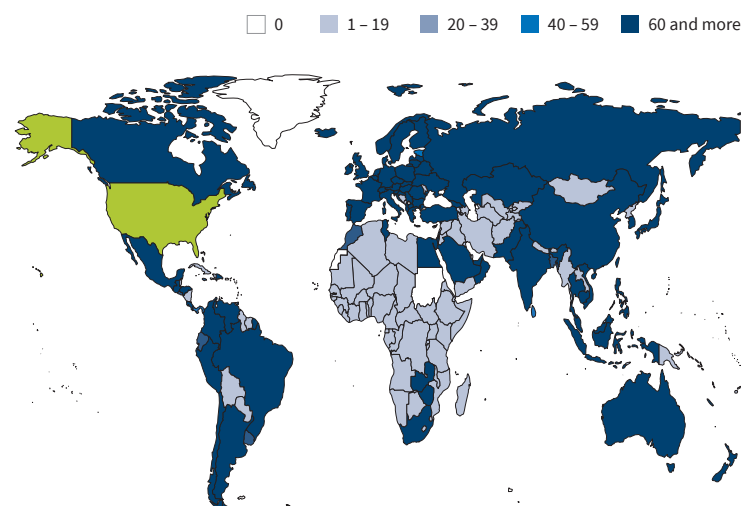Source: Global Trade Alert Data.   © ifo Institute

With the appointment of Donald Trump as the new US president, this 'America first' attitude reached new dimensions. In terms of its global tariff rates, the United States can be considered a very open economy due to its relatively low tariffs. This country has reduced tariffs both within NAFTA and within the WTO to a relatively low level compared to its respective trading partners. If non-tariff barriers are taken into consideration, however, this statement needs to be qualified. Examining non-tariff trade protection, however, the United States proves to be an increasingly protectionist country – especially in recent years. In the last two years, the number of regulatory trade barriers, on the US import side, has increased considerably. Figure 2 shows the development of an increasingly protectionist attitude on the part of the United States; especially in the recent past. In 2009, only 126 protectionist measures were evident. In 2017 the number rose to almost 1,200 discriminatory measures.

Compared to the remaining G20 countries, the United States is by far the most protectionist country, as

it implements the highest number of non-tariff barriers (see Figure 3). The darker the shaded area, the higher the number of US protectionist measures against the respective region.

Empirical studies showed that it is not an increase in tariffs, but an increase in non-tariff barriers that is responsible for creating welfare losses. The protectionist measures adopted by the United States may therefore have serious consequences. The increasingly diffident US attitude towards international trade might have consequences that go beyond the economy to impact for politics and society across the globe. More specifically, the United States has put the already very advanced trade agreements negotiated with both the EU and the trans-pacific countries on hold: TTIP and TPP are not being implemented for the time being. Official papers on the foreign trade strategy of the US president suggest renegotiating old agreements if goals like lowering the trade deficit, are not achieved. The United States has announced a renegotiation of the North American Free Trade Agreement, and in addition to NAFTA the Korean agreement and the conditions for China's WTO membership are also candidates for US protectionism. The main goals of this protectionism include new job creation, lowering the trade deficit and an economic upswing. But this 'Hire American, Buy American' approach misjudges the fact that the trade balance is more dependent on the saving and investment decisions made by US citizens than on trade policy. The US attention is particularly focused on Germany and China.

In recent years, China has played a particularly important role in US trade relations with the rest of world. After China joined the WTO 2001 in particular, US trade with the country surged dramatically. This development was the driving force behind the steadily growing US trade deficit with China. US import value from China now exceeds 3.5 times that of US exports to China. Over the years a persistent US trade deficit has not only existed with China. The United States is currently running a sizeable trade deficit with eight out of its ten most important trading partners. These partners include Japan and Germany, which export twice as much to the United States as they import. Wit-

Figure 3

Number of US Protectionist Measures per Country (in Force)

Source: Own illustration; World Economic Outlook, IMF, 2016.   © ifo Institute

hin the EU, trade relations with the United States are predominantly characterised by trade surpluses.

The US administration is currently examining trade relations with all foreign countries and is evaluating whether the trade practices are 'fair' from a US perspective. If trade practices by foreign countries are classified as non-competitive or unfair, the US administration plans to restrict their access to the US market. Specifically, the taxation of goods in America is to be reformed to the disadvantage of imported, foreign value-added. This is to be achieved by, among other things, a so-called Border Tax Adjustment (BTA). The fact that the United States in particular is showing an increasingly reserved attitude towards international trade weighs particularly heavy.

On the one hand, the United States is a relatively open economy with regard to tariffs, both within NAFTA and with the rest of the world; while, on the other hand, it is highly protectionist in form of non-tariff barriers. Although the US service sector is increasingly moving into trade surpluses, political dissatisfaction with long-run adjustments is understandable. High trade deficits in goods trade, coupled with high import volumes from China and Europe, raise the question of how these developments are compatible with the low level of job creation in traditional industries in the mid-Western United States. Thus, the call for a correction of these imbalances *via* a protectionist trade policy is initially understandable. Nevertheless, a protectionist trade policy is very unlikely to address these economic imbalances. The threats of worldwide counteractive protectionist measures will not only harm key US trading partners, but will predominantly threaten the stability of global economy.

QUANTITATIVE ANALYSIS – IFO TRADE MODEL

The essential objective in the following analysis is to quantify all of the trade effects that take place. Firstly, the direct response of trade flows to an increase in tariffs; and secondly, general equilibrium effects, such as price adjustments for consumers and the indirect increase in production costs. Trade protectionism can certainly benefit individual stakeholders, while being to the advantage of a majority of economic agents. The quantification of general equilibrium welfare effects is therefore of particular interest to avoid any political misguidance.

The underlying ifo Trade Model, described in detail in Aichele *et al.* (2014) and Aichele *et al.* (2016) is a static, general equilibrium model of international trade. It is used to analyse different political scenarios. Data for the value-added linkages are derived from a global input-output database (WIOD 2017), covering over 90 percent of global value added as a result. The trade policy scenarios simulate different, counterfactual scenarios in which the United States introduces a protectionist trade policy in the world, observed today by reintroducing tariffs and establishing non-ta-

riff trade barriers. It provides quantitative information on the resulting changes in gross household income, trade flows, and sectoral production structures in this alternative world. The base year for the simulations is 2014 and the model encompasses 43 countries, as well as the rest of the world and a detailed structure for 50 goods sectors, making a heterogeneous sector analysis viable. The WIOD database used provides the latest available data in a harmonised form for goods and services transactions, and is compatible with the input-output tables of different countries. The database provides value-added information and production values on a sectoral level, and bilateral intermediate and final goods trade flows with producer and consumer prices (incl. services). Bilateral input-output tables and value-added levels can be constructed. Data on bilateral tariffs is retrieved from the World Integrated Trade Solutions (WITS TRAINS), as well as the integrated database (IDB) of the WTO. The estimated demand elasticities are based on the results obtained by Felbermayr *et al.* (2017). One has to note that, unlike in macroeconomic models, the static CGE model does not take any dynamic effects like capital accumulation, savings and investment behaviour over time, into account and neither a monetary aspect nor exchange rate policies are simulated here. The potential dynamic effects of trade like the innovation activities of firms or the diffusion of technologies are also beyond the scope of this analysis. The contribution of the ifo Trade Model is to quantify structural adjustments, which in turn provides insights into the implications for production structures within sectors and across trading partners.

SCENARIOS

This subsection presents the actively communicated US trade policies that may potentially be implemented by the current US administration. Additionally, an isolation of the US market – as far as possible under the WTO agreement – is simulated. Due to uncertainties in the potential design of a US protectionist policy, it is necessary to quantify different scenarios. A detailed analysis and description of counterfactual policies can be retrieved from the recent ifo study on the consequences of Trump's protectionist aspirations.

Scenario No. 1: Withdrawal from NAFTA

The first scenario considers the expected economic consequences of a partial reintroduction of US trade barriers with NAFTA countries. To this end, it considers possible tariff adjustments and non-tariff barriers between the NAFTA countries. Countries like Germany could be indirectly affected due to the weakening of demand from NAFTA members due to protectionism. Sectors heavily reliant on this region's trade in particular may face negative consequences. However, third countries may also stand to profit from

a decrease in trade between NAFTA members through trade diversion effects. The German automotive industry could, for example, act as a substitute for initial US demand from Mexico or Canada in this scenario.

Scenario No. 2: Protectionist US Trade Policy with Respect to the Rest of the World

In principle, it is possible for the United States to introduce an even stronger protectionist trade policy by systematically raising tariffs on all traded goods of all WTO trading partners. The first sub-scenario assumes a one-sided US tariff increase of 20 percentage points. Simultaneously, WTO members increase their tariffs towards the United States, thus simulating tariff retaliation in response to the increased US import duties. In addition to the tariff increases of the previous scenario, the second sub-scenario includes a simultaneous 20 percent increase in non-tariff barriers against all US trading partners and *vice versa.*

Scenario No.3: Introduction of Border Tax Adjustment

In 2016, the US representatives Paul Ryan and Kevin Brady introduced a new tax reform. They suggested a decrease in the federal tax on corporate profits from today's 35 percent to 20 percent, enabling investments to become completely deductible and making international revenues subject to the Border Tax Adjustment. Concrete, exports are tax deductible, while imports have to be added. Consequently, the system would tax consumption more heavily than production, making it equivalent to the European system of value added taxes. It thereby offsets the disadvantage of (non-deductible) equity as opposed to deductible foreign capital. The US administration wants to tax domestic consumption instead of domestic production by increasing tariffs on imports and dispensing exports from taxation. Implicitly, such a tax policy means that US imports are subject to a protective tariff. The introduction of such a trade policy could not only affect foreign suppliers, but also US citizens. It is therefore of general interest that such a tax policy is evaluated quantitatively. This quantitative analysis shows which countries stand to gain from this trade policy and which will lose out. By assuming a flexible exchange rate, the US trade balance can be expected to remain largely unchanged, and any changes will be confined to welfare parameters, like changes in tax revenues and terms-of-trade conditions. Effects can nevertheless be expected across sectors and trading partners.

RESULTS

As already described, the ifo Trade Model is able to show the trade diversion and creation effects arising due to a counterfactual change in trade policies. Table 1 shows the top-10 US exporting destinations and the respective initial value of exports in million US dollars. Furthermore, the table shows the resulting percentage changes of US exports for each of the scenarios. Table 2 is built similarly as Table 1 and shows the US import side.

As a result of the protectionist US policies implemented against the other NAFTA members, exports from the NAFTA members decrease the most (– 21 percent

Table 1

Change in Bilateral US Exports with Top-10 Trading Partners

Rank	Importing country	Value of initial US exports (million US dollars)	Change in exports (%)			
			NAFTA	WTO (only tariff change)	WTO (tariff and NTB change)	BTA
				with retaliation		
1	Canada	289,808	– 11.4	– 48.6	– 73.7	– 6.1
2	Mexico	176,284	– 9.8	– 55.6	– 77.8	– 6.9
3	China	110,369	– 1.2	– 48.0	– 76.9	– 7.5
4	Germany	79,446	– 0.8	– 34.7	– 73.8	– 7.5
5	UK	73,643	– 1.3	– 41.6	– 76.0	– 4.1
6	Japan	63,598	– 1.2	– 48.7	– 75.3	– 5.4
7	Ireland	60,924	– 0.1	– 12.5	– 61.9	– 6.2
8	France	57,650	– 2.0	– 38.4	– 76.4	– 5.3
9	Netherlands	47,883	– 1.3	– 30.4	– 72.1	– 7.0
10	Korea	43,853	– 1.1	– 45.0	– 75.0	- 7.1
	Total	1,917,773	– 3.52	– 38.54	– 73.45	– 5.87

Source: ifo Trade Model.

Table 2

Change in Bilateral US Imports with Top–10 Trading Partners

Rank	Exporting country	Value of initial US imports (million US dollars)	Change in imports (%)			
			NAFTA	WTO (only tariff change)	WTO (tariff and NTB change)	BTA
				with retaliation		
1	Canada	348,576	– 21.2	– 34.0	– 57.0	– 5.8
2	China	344,939	1.5	– 37.3	– 59.3	– 6.7
3	Mexico	265,531	– 13.7	– 37.4	– 58.6	– 6.7
4	Germany	134,374	3.2	– 32.4	– 62.0	– 5.0
5	Japan	120,174	4.1	– 38.5	– 60.8	– 6.1
6	UK	85,289	2.1	– 17.2	– 61.3	– 0.5
7	Korea	77,881	3.5	– 34.0	– 61.3	– 5.4
8	France	49,168	1.6	– 21.5	– 61.1	– 1.6
9	Italy	44,966	2.0	– 33.4	– 59.4	– 5.1
10	India	36,474	2.2	– 32.1	– 55.0	– 5.0
	Total	2,395,728	– 2.82	– 30.85	– 58.80	– 4.70

Source: ifo Trade Model.

of exports from Canada and – 14 percent of exports from Mexico). Exports from the other most important US-export destinations increase slightly between 1.5 and 3.5 percent (see Table 2, NAFTA scenario). On aggregate, however, US exports decrease by 3.5 percent, meaning that the positive trade diversion effect towards third countries like Germany or France cannot compensate for the decrease in trade with Canada and Mexico (see Table 1, NAFTA scenario). This picture looks quite similar for the import side, because trade diversion effects resulting from the resolution of NAFTA induce an increase in US imports from non-NAFTA members, mainly from China, Japan and Germany. At the same time, however, imports from NAFTA countries decrease by 21 percent (Canada) and 14 percent (Mexico), as already mentioned above. Overall, US imports decrease, which shows that the negative effects dominate (see Table 2, NAFTA scenario).

A protectionist US trade policy with respect to the rest of the world, as simulated in the next two depicted scenarios (WTO scenarios, only tariff change and tariff plus NTB change), would have larger effects on the US trade structure than the NAFTA scenario. This outcome is reasonable, because a protectionist trade policy would not only affect the trade structure with NAFTA members, it would also influence trade relations with all other remaining WTO members. Overall, US exports would decrease by 73.5 percent in the case of higher tariffs and non-tariff barriers (Table 1). The change in bilateral exports is relatively homogeneous across all top-10 US export destinations. Only exports to Ireland are less negatively impacted than those to other countries, which can be ascribed to the high rate of service trade (e.g. financial transfers) between the United States and Ireland. The effects on US imports look fairly similar, although the percentage changes are a little bit smaller. In total, US imports would decrease by 58.8 percent (NTB plus tariff change, WTO scenario), as shown in Table 2. When only tariffs are treated and not NTBs, US imports decrease by 30.85 percent.

Table 3

Change in Sectoral Value Added of US Manufacturing and Agricultural Sectors

| | Initial value added | Share of value added | Change of sectoral value added, different scenarios | | | | | | | |
| | | | NAFTA | | WTO only tariffs | | WTO tariffs and NTBs | | BTA | |
	million USD	%	%	million USD	%	million USD	%	million USD	%	million USD
Crop and animal production, etc.	177,155	1.02	– 0.1	– 195	– 5.64	– 9993	– 7.28	– 12,890	– 2.12	– 3,760
Forestry and logging	23,752	0.14	– 1.9	– 444	– 0.12	– 29	4.10	973	– 2.13	– 507
Fishing and aquaculture	14,505	0.08	– 5.9	– 852	– 0.43	– 63	3.52	510	– 1.99	– 289
Mining and quarrying	455,588	2.62	5.3	24,299	0.62	2,824	5.48	24,945	– 0.88	– 4,006
Food, beverages and tabacco	243,253	1.40	– 0.2	– 406	– 2.54	– 6,172	– 3.93	– 9,550	– 1.74	– 4,244
Textiles, wearing apparel and leather	27,698	0.16	– 1.3	– 349	11.47	3,177	31.76	8,796	– 3.21	– 890
Wood and products of wood and cork	28,805	0.17	0.9	255	– 0.57	– 165	0.95	274	– 1.31	– 377
Paper	55,730	0.32	– 0.2	– 135	– 4.68	– 2,609	– 4.88	– 2,721	– 1.99	– 1,111
Printing and reproduction of recorded media	38,301	0.22	1.0	365	– 2.92	– 1,118	– 5.24	– 2,007	– 0.96	– 369
Coke, refined petroleum	182,719	1.05	– 2.8	– 5,134	– 6.94	– 12,672	– 8.75	– 15,988	– 2.39	– 4,373
Chemicals and chemical products	267,111	1.54	– 0.3	– 873	– 4.91	– 13,108	– 3.21	– 8,570	– 3.18	– 8,493
Basic pharmaceutical products and preparations	95,467	0.55	– 1.4	– 1,361	– 2.25	– 2,150	1.87	1,785	– 3.11	– 2,966
Rubber and plastics	75,501	0.43	0.5	405	– 2.79	– 2,105	– 1.17	– 886	– 2.21	– 1,671
Other non–metallic mineral	46,791	0.27	– 0.4	– 169	– 2.04	– 953	– 1.37	– 642	– 1.79	– 840
Basic metals	60,861	0.35	– 0.2	– 127	– 0.82	– 497	8.21	4,998	– 1.39	– 845
Fabricated metal	147,060	0.85	0.1	202	– 3.83	– 5,630	– 2.81	– 4,127	– 1.67	– 2,459
Computer, electronic and optical products	269,400	1.55	– 0.8	– 2,213	5.30	14,275	21.32	57,433	– 4.81	– 12,971
Electrical equipment	54,138	0.31	1.7	918	6.77	3,663	24.02	13,002	– 4.19	– 2,267
Machinery and equipment; repair and installation	175,012	1.01	– 1.7	– 2,932	– 3.49	– 6,100	0.98	1,708	– 4.07	– 7,124
Motor vehicles, trailers and semi– trailers	141,160	0.81	2.0	2,820	2.53	3,575	10.19	14,390	– 3.16	– 4,463
Other transport equipment	127,798	0.74	– 0.2	– 292	– 20.43	– 26,105	– 27.12	– 34,657	– 5.73	– 7,321
Furniture and other manufacturing	105,839	0.61	– 2.8	– 2,956	0.84	887	4.61	4,879	– 3.04	– 3,213

Source: Ifo Trade Model.

Table 4

Change in Sectoral Value Added of US Services Sectors

	Initial value added (million USD)	Share of value added (%)	Change of sectoral value added, different scenarios							
			NAFTA		WTO				BTA	
					only tariffs		tariffs and NTBs			
			%	million USD	%	million USD	%	million USD	%	million USD
Electricity, etc.	272,719	1.57	0.2	574	−1.10	−2,991	−2.09	−5,691	−0.35	−948
Water collection, treatment and supply	9,317	0.05	0.2	18	−1.38	−128	−0.80	−75	−0.15	−14
Sewerage, waste collection, etc.	43,150	0.25	−0.1	−39	−4.43	−1,910	−9.19	−3,965	5.37	2,315
Construction	665,785	3.83	0.3	1,880	−0.47	−3,131	−2.29	−15,269	−0.59	−3,904
Wholesale etc. of motor vehicles and motorcycles	254,916	1.47	0.8	2,073	−0.81	−2,076	−0.92	−2,339	−0.31	−783
Wholesale trade (except motor vehicles & motorcycles)	1,044,655	6.01	0.2	2,186	−2.70	−28,246	−8.86	−92,604	−2.00	−20,843
Retail trade (except motor vehicles & motorcycles)	815,874	4.69	0.4	3,017	−0.57	−4,648	−2.03	−16,533	−0.58	−4,737
Land transports and transport via pipelines	240,382	1.38	0.1	278	−3.05	−7,335	−7.54	−18,126	−1.47	−3,527
Water transport	18,593	0.11	0.1	13	−4.85	−902	−20.46	−3,805	−4.33	−806
Air transport	84,344	0.49	−0.3	−219	−5.88	−4,957	−11.16	−9,409	−3.33	−2,807
Warehousing and support activities for transportation	106,151	0.61	0.1	125	−3.05	−3,243	−9.76	−10,364	−0.81	−856
Postal and courier	57,439	0.33	0.1	42	−3.51	−2,017	−12.87	−7,393	−1.09	−624
Accommodation and food	487,443	2.80	0.0	158	−0.77	−3,747	−2.33	−11,363	−0.46	−2,244
Publishing	210,656	1.21	0.2	472	−1.85	−3,893	−9.10	−19,168	−1.93	−4,070
Motion picture, video and television	200,183	1.15	0.1	248	−1.81	−3,616	−7.09	−14,193	−1.41	−2,816
Telecommunications	326,912	1.88	0.2	800	−1.25	−4,084	−4.82	−15,747	−0.80	−2,603
IT services, etc.	338,229	1.95	0.2	838	−1.93	−6,543	−3.01	−10,192	−0.57	−1,914
Financial services	488,092	2.81	0.2	1,143	−1.98	−9,650	−8.12	−39,616	−1.41	−6,875
Insurance, etc.	734,910	4.23	0.2	1,741	−1.59	−11,710	−3.92	−28,789	−0.65	−4,772
Real estate	2,059,168	11.85	0.3	5,559	−0.56	−11,598	−2.66	−54,805	−0.54	−11,056
Legal and accounting	693,747	3.99	0.2	1,160	−2.12	−14,717	−3.74	−25,935	−0.28	−1,961
Architecture and engineering, etc.	448,150	2.58	0.3	1,361	−2.47	−11,075	−4.56	−20,456	−0.92	−4,105
Scientific research and development	140,414	0.81	0.2	275	−2.23	−3,131	−5.37	−7,543	−1.06	−1,490
Administration and support services	672,085	3.87	0.1	866	−3.07	−20,612	−1.56	−10,483	−0.26	−1,766
Public administration and defence, etc.	2,277,285	13.10	0.3	5,895	−0.52	−11,794	−2.69	−61,351	−0.66	−15,097
Education	192,773	1.11	0.2	446	−0.76	−1,465	−2.70	−5,206	−0.72	−1,389
Human health and social work	1,227,402	7.06	0.3	3,587	−0.35	−4,344	−2.27	−27,805	−0.66	−8,076
Other services	458,561	2.64	0.2	1,136	−0.76	−3,494	−2.63	−12,052	−0.50	−2,301

Source: ifo Trade Model.

The aggregate effect of the BTA causes a small decline in total US exports (-5.87 percent in Table 1) and imports (– 4.7 percent in Table 2). In relative terms, US trade declines homogeneously across all partner countries.

Changing trade patterns through protectionism do not solely affect the import and export structure, but also impacts the sectoral output of a country. On that account, the next two tables illustrate the changes in US sectoral value added. The percentage change featured in these tables gives an indication of the amount of pressure a sector is exposed to in times of the rising protectionism. Table 3 shows the initial US value added for all goods in millions of US dollars, its initial share, the percentage changes and the change in million US dollars that occur in the counterfactual scenarios. The US mining industry (5.3 percent), wood and wood products (0.9 percent), print and reproductive media (1 percent), rubber and plastic (0.5 percent), processed metals (0.1 percent), and electrical machinery (1.7 percent) increase their sectoral value added in the case of the end of NAFTA.

Nonetheless, this does not compensate for the losses in the remaining sectors. Among others, the US agricultural sectors suffer from the potential termination of the NAFTA: crops decreases its sectoral value added by 0.1 percent, food and beverages by 0.2 percent and the fishery sector loses 5.9 percent. Similarly to the trade picture, the WTO protectionist scenarios influence the United States to a larger extent than is the case in the NAFTA scenario.

For most US sectors the strongest decrease occurs when WTO member countries retaliate against the protectionist measures of the United States. The sectoral value added changes increase with the growing extent of protectionism (WTO scenario increase of tariffs and/or NTBs). The vehicles sector 'other means of transport' faces a decrease of 27.1 percent, followed by the 'water transport' sectors (– 20.5 percent). In nominal terms, the sectoral value added in wholesaling (excluding vehicles) only drops by 8.86 percent; yet this decline amounts nominally to 93 billion US dollars, which represents the greatest absolute sectoral contraction in the United States (see Table 4). But there are also sectors like the computer and electronical machinery sectors that can expect an increase in sectoral value added (Table 3). The last scenario, the adjustment of the Border Tax shows a relatively homogeneous decrease in value

added across all manufacturing and agricultural sectors. Most US service providers gain homogeneously between 0.1 percent and 0.8 percent in value added in the case of the dissolution of the NAFTA. Only a few sectors such as air transport (– 0.3 percent) are confronted with a decrease in their value added (Table 4). In general, the value added changes for services changes less heterogeneously across sectors than in the goods' sectors.

The revocation of the NAFTA would do considerable economic damage to its member countries: the United States (– 0.22 percent), Mexico (– 0.96 percent) and Canada (– 1.54 percent) as shown in Table 6. With the exception of Luxembourg (0.06 percent in Table 5) and Norway (0.09 percent in Table 6), it would hardly change real income for third countries (see again Tables 5 and 6). The same applies to real wage changes.

In the case of increased protectionism against all WTO-members and *vice versa*, the real income and real wages of the WTO members incur losses from increasing tariffs and non-tariff barriers. Mexico (– 3.42 percent) and Canada (– 3.85 percent) in particular experience disproportionate declines and the US real income would shrink by 2.32 percent (Table 6). For some countries, retaliation might compensate for the economic losses in the case of unilateral US pro-

Table 5

Real Income and Real Wage Changes for EU28 Countries

	Real income changes (%)				Real wage changes (%)			
	NAFTA	WTO (only tariff change)	WTO (tariff and NTB change)	BTA	NAFTA	WTO (only tariff change)	WTO (tariff and NTB change)	BTA
		with retaliation				with retaliation		
Austria	0.01	– 0.09	– 0.20	– 0.15	0.00	– 0.12	– 0.22	0.03
Belgium	0.02	– 0.09	– 0.72	0.34	0.01	– 0.28	– 0.80	0.52
Bulgaria	0.00	– 0.04	– 0.12	0.78	0.01	– 0.07	– 0.12	0.67
Cyprus	– 0.02	– 0.02	0.00	1.02	0.00	– 0.05	0.02	0.95
Czech Rep.	0.02	– 0.03	– 0.13	– 0.67	0.01	– 0.09	– 0.19	– 0.16
Germany	0.03	– 0.14	– 0.40	– 0.86	0.00	– 0.21	– 0.43	– 0.22
Denmark	0.02	– 0.11	– 0.28	– 0.50	0.00	– 0.13	– 0.30	– 0.05
Spain	0.02	– 0.01	– 0.06	0.27	0.02	– 0.07	– 0.09	0.29
Estonia	0.01	– 0.04	– 0.14	0.24	0.00	– 0.09	– 0.17	0.31
Finland	0.00	– 0.09	– 0.32	0.31	0.00	– 0.14	– 0.35	0.35
France	0.00	– 0.04	– 0.25	0.48	0.00	– 0.12	– 0.29	0.46
UK	0.00	– 0.10	– 0.43	0.76	0.01	– 0.24	– 0.50	0.75
Greece	– 0.01	– 0.01	– 0.08	0.88	0.01	– 0.02	– 0.04	0.84
Croatia	0.00	– 0.06	– 0.15	0.40	0.00	– 0.11	– 0.19	0.41
Hungary	0.03	– 0.06	– 0.32	– 0.40	0.01	– 0.12	– 0.36	0.02
Ireland	0.00	– 0.78	– 3.60	– 0.46	– 0.03	– 0.76	– 3.00	0.70
Italy	0.01	– 0.07	– 0.19	– 0.10	0.00	– 0.10	– 0.20	0.03
Lithuania	0.04	– 0.13	– 0.17	– 0.43	0.03	– 0.16	– 0.18	0.02
Luxembourg	0.06	– 0.47	– 2.31	– 1.36	0.00	– 0.41	– 1.79	0.10
Latvia	– 0.01	– 0.04	– 0.08	0.61	0.00	– 0.08	– 0.09	0.54
Malta	0.01	– 0.09	– 0.46	0.71	0.00	– 0.17	– 0.50	0.66
Netherlands	0.04	– 0.05	– 0.60	– 0.74	0.00	– 0.25	– 0.70	0.05
Poland	0.01	0.00	– 0.09	– 0.11	0.00	– 0.04	– 0.12	0.05
Portugal	0.00	– 0.04	– 0.10	0.57	0.00	– 0.07	– 0.10	0.52
Romania	0.01	– 0.02	– 0.07	0.36	0.00	– 0.05	– 0.10	0.37
Slovakia	0.02	– 0.05	– 0.13	– 0.38	0.01	– 0.11	– 0.17	– 0.05
Slovenia	0.01	– 0.03	– 0.04	– 0.39	0.00	– 0.05	– 0.07	– 0.02
Sweden	0.01	– 0.07	– 0.27	– 0.02	0.00	– 0.11	– 0.31	0.22

Source: ifo Trade Model.

Table 6

Real Income and Real Wage Changes for Non–EU28 Countries

	Real income changes (%)				Real wage changes (%)			
	NAFTA	WTO (only tariff change)	WTO (tariff and NTB change)	BTA	NAFTA	WTO (only tariff change)	WTO (tariff and NTB change)	BTA
		with retaliation				with retaliation		
Australia	0.01	– 0.05	– 0.25	0.22	0.00	– 0.17	– 0.33	0.22
Brazil	0.00	– 0.06	– 0.24	0.36	0.00	– 0.18	– 0.29	0.32
Canada	– 1.54	– 1.20	– 3.85	0.70	– 1.44	– 2.73	– 4.73	0.75
Switzerland	0.02	– 0.11	– 0.50	– 0.56	– 0.01	– 0.16	– 0.46	0.04
China	0.01	– 0.17	– 0.34	– 0.60	0.00	– 0.19	– 0.31	– 0.25
Indonesia	0.01	– 0.11	– 0.23	0.01	0.00	– 0.14	– 0.24	0.04
India	0.01	– 0.06	– 0.14	0.24	0.01	– 0.10	– 0.16	0.24
Japan	0.01	– 0.11	– 0.29	0.26	0.01	– 0.21	– 0.34	0.22
Korea	0.05	– 0.16	– 0.61	– 0.73	0.01	– 0.33	– 0.66	– 0.18
Mexico	– 0.96	– 1.10	– 3.42	0.30	– 0.90	– 2.31	– 4.00	0.34
Norway	0.09	– 0.10	– 0.24	– 1.10	0.03	– 0.13	– 0.29	– 0.25
Russia	0.04	– 0.08	– 0.12	– 0.34	0.02	– 0.10	– 0.14	– 0.03
Turkey	0.00	– 0.08	– 0.24	0.14	0.00	– 0.16	– 0.28	0.22
Taiwan	0.03	– 0.25	– 0.74	– 1.45	0.00	– 0.39	– 0.70	– 0.50
USA	– 0.22	– 0.30	– 2.32	– 0.67	– 0.23	– 1.43	– 2.93	0.04

Source: ifo Trade Model.

tectionist policies. In the case of Germany, this would imply a 0.40 percent loss of GDP (Table 5), while China's GDP would only drop by 0.34 percent (Table 6). But one can see that retaliatory trade policy measures by WTO members against the US do not improve the economic situation in any country; making it a 'lose-lose' scenario. In general, this can be attributed to the strong dependency of domestic economies on the US market. Individual countries can nevertheless reduce their potential losses by taking countervailing measures (like increasing tariffs), but not a single country can fully compensate for the loss of gross household income and real wages incurred. Vengeance should therefore not be a main response to threatened, discriminatory US policies. Instead, a prior containment of protectionist policies is highly advisable.

Contrary to the intentions of the US government, the introduction of the BTA causes a negative US real income change of 0.67 percent (in Table 6). Taiwan (– 1.45 percent), Luxembourg (– 1.3 percent), Norway (– 1.1 percent), Germany (– 0.86 percent), the Netherlands (– 0.74 percent) and South Korea (– 0, 73 percent) suffer even greater losses from the BTA than the US itself. On average, Europe experiences an increase in its gross household income of 0.04 percent, as the BTA positively affects gross household income for the majority of EU28 countries. These changes are nevertheless quite small and therefore coincide with the prevailing views expressed in the literature on this topic.

The US real wage is also hardly affected by its implemented BTA (Table 6) and the EU28 effects are quite diverse. There are countries like Austria (0.03 percent), Belgium (0.52 percent), France (0.46 percent) and Britain (0.75 percent) that stand to gain in real wages. Germany (– 0.22 percent) and Denmark (– 0.05 percent), on the other hand, will suffer from US protectionist policies (Table 5).

CONCLUSION

With the inauguration of Donald Trump, the new US administration initiated a detailed analysis to identify supposedly increasing 'unfair trade practices' by other nations that threaten or destroy 'well-paid American jobs'. Several US trading partners were viewed with growing scepticism as a result. As counterstrategy, the US administration has presented three protectionist trade policies as potential measures for correcting what it perceives to be unfair trade. Based on a recent ifo trade study, this report substantiates the effects of a US protectionist trade policy agenda and offers a comprehensive assessment of the political debate. In all of the scenarios presented, an isolation of the US market would primarily have a negative effect on the US economy itself. A worldwide policy of retaliation against the US protectionism will lead to substantial economic damage; particularly to the United States itself. A protectionist trade policy will not solve the economic challenges facing this country. Seeking for new forms of cooperation between the United States and its main trading partners like China, Germany and the NAFTA partners would be a far more effective strategy.

REFERENCES

Aichele, R., G. Felbermayr and I. Heiland (2014), *Going Deep: The Trade and Welfare Effects of TTIP*, CESifo Working Paper 5150.

Aichele, R., G. Felbermayr and I. Heiland (2016), *Going Deep: The Trade and Welfare Effects of TTIP Revised*, ifo Working Paper 219.

Bergstrand, J., M. Larch and Y. Yotov (2015), "Economic Integration Agreements, Border Effects, and Distance Elasticities in the Gravity Equation", *European Economic Review* 78, 307–327.

Caliendo, L. and F. Parro (2015), "Estimates of the Trade and Welfare Effects of NAFTA", *Review of Economic Studies* 82, 1–44.

Cimino-Isaacs, K. (2017), *A Guide to Renegotiating NAFTA,* Peterson Institute, https://piie.com/blogs/trade-investment-policy-watch/guide-renegotiating-naa.

Dai, M., Y. Yotov and T. Zylkin (2014), "On the Trade-Diversion Effects of Free Trade Agreements", *Economics Letters* 122, 321–325.

Felbermayr, G., B. Jung and M. Larch (2015), "Optimal Tariffs, Retaliation, and the Welfare Loss from Tariff Wars in the Melitz Model", *Journal of International Economics* 89, 13–25.

Felbermayr, G., J. Gröschl and I. Heiland (2017), *The European Union in Turmoil: A General Equilibrium Analysis of Trade and Welfare Effects,* ifo Institute, mimeo.

Freund, C. and J. Gagnon (2017), *Effects of Consumption Taxes on Real Exchange Rates and Trade Balances,* PIIE Working Paper 17-5.

Head, K. and T. Mayer (2014), "Gravity Equations: Workhorse, Toolkit, and Cookbook", in: Gopinath, G., E. Helpman and K. Rogoff (eds.), *Handbook of International Economics,* Vol. 4, Amsterdam: Elsevier, 131–195.

Head, K., T. Mayer and J. Ries (2010), "The Erosion of Colonial Trade Linkages after Independence", *Journal of International Economics* 81, 1–14.

Jung, B. (2012), "Gradualism and Dynamic Trade Adjustment: Revisiting the Pro Trade Effect of Free Trade Agreements", *Economics Letters* 115, 63–66.

Timmer, M., E. Dietzenbacher, B. Los, R. Stehrer and G. Vries (2015), "An Illustrated User Guide to the World Input–Output Database: The Case of Global Automotive Production", *Review of International Economics* 23, 575–605.

Yalcin, E., M. Steininger and G. Felbermayr (2017), *Global Impact of a Protectionist U.S. Trade Policy,* ifo Forschungsberichte 89, Munich: ifo Institute.