

Simulating Some of the Administration's Trade policies

By: Fred Campano and Dominick Salvatore¹

Based on data taken from the national accounts provided by the United Nations Statistical Office for 2017, the United States was the largest importer of goods and services. This amounted to 15.7% of the world's total. China was the second largest importer with 11.1% of the world's total. In the United States, the share of imports in GDP has been annually higher than the corresponding share of exports in GDP for decades (figure 1). Over the period 2000 – 2017, the average trade deficit was 3.87% of GDP, with no sign of improvement. One way to reduce the national debt, is to reduce the external deficit and that can be done by either reducing imports or increasing exports (or some combination of both). Most developing Asian countries have been successful narrowing their external deficit by following the post-war Japanese model of export promotion while developing countries elsewhere did not do as well

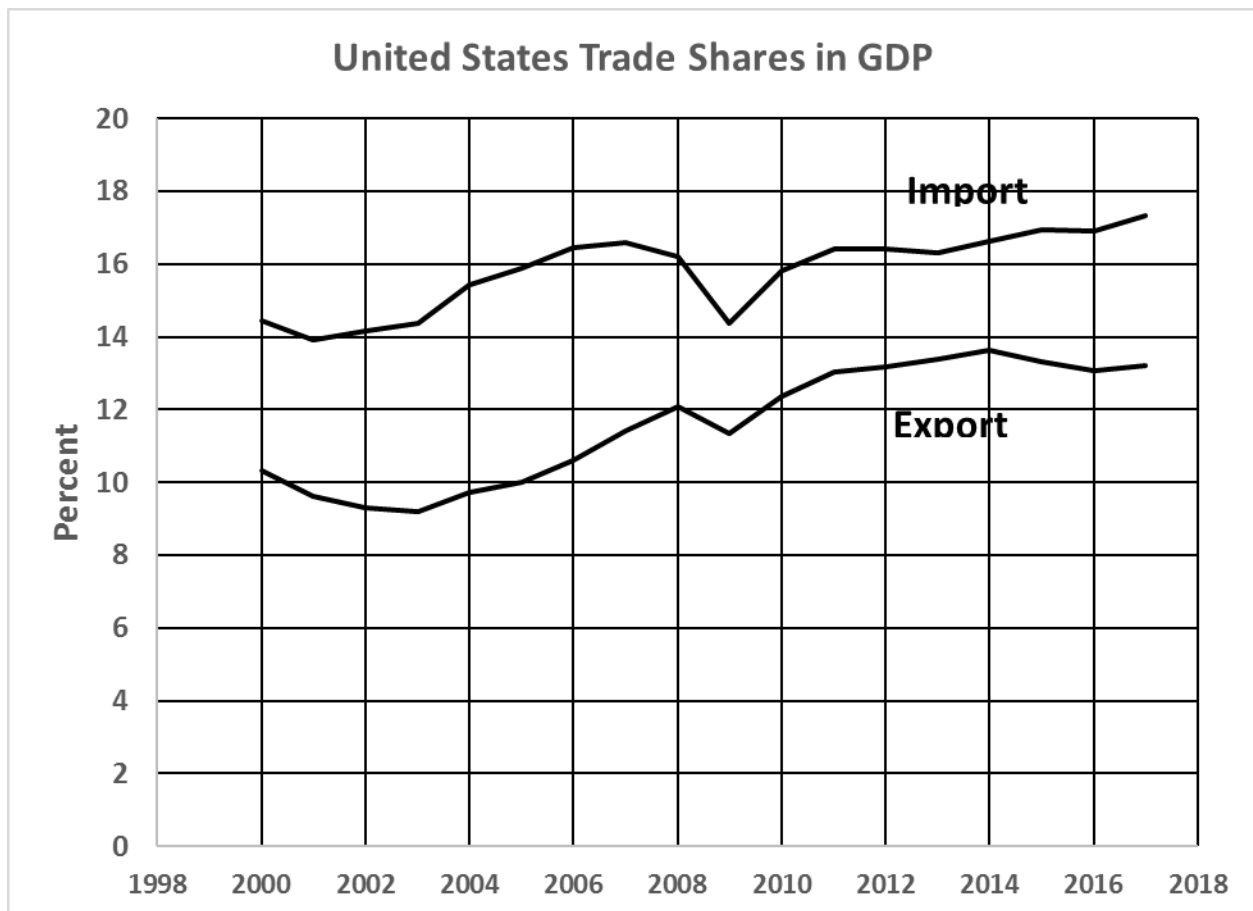


Figure 1

¹ Fordham University

employing import substitution policies. However, part of the reason why import substitution policies have not worked for developing countries is because of the delay it takes to develop a comparative advantage when the country lacks the technologies of the more advanced countries. However, if the United States practices import substitution, lack of technology will not be a binding constraint to growth. In this paper, we will simulate some of the results for the United States and 19 of its major trading partners which constitute 75% of the market for US exports. For each country we estimate a macroeconomic model of its national account's expenditure. The residual 25% of the US exports are spread over the remaining rest of the world (ROW). None of these countries account for as much as 1% of the total US exports. To this end, three scenarios have been estimated, namely: 1. a baseline scenario which is a continuation of the trends from 2000 – 2017 without any intervention of imports, 2. a non-discrimination scenario where the US reduces its total import demand by 10%, and 3. a simulation of some of the bilateral trade agreements of the United States with its major trading partners.

I. The Methodology

In order to project the national accounts expenditure table to the year 2020 a Harrod-Domar production function is estimated by individual country and an aggregate group "rest-of-the world". We also used the bilateral export data taken from the United Nations trade by destination data bank to construct a 21 by 21 trade share matrix in which the columns are the trade shares in the imports of the 21 countries and groups. Import demand of each country is estimated within the country's expenditure model and a vector of world demand of imports is filled. When the matrix is multiplied by the vector of total import demand of the 21 countries (and ROW), the vector of exports allocated to each country (or ROW) is the result.

The other components of the country's expenditure, that is, household consumption and government expenditure are also determined by demand functions driven by GDP. Investment shares in GDP are exogenous and based on the average shares from 2011 to 2017, but the incremental capital-output ratio is estimated over the longer period from 2000 to 2017. The estimated parameters for each country (and group) are shown in the appendix.

II. Scenario 1: The Baseline Scenario

GDP is projected using the Harrod-Domar model. No assumption is made of any change in trade policy in the United States nor anywhere else. Table 1 shows the projections for the US in levels (2005 US dollars) and each expenditure component as a share of GDP. The projected growth rate which is based on the estimated Harrod-Domar parameters is 1.64% per annum. A summary of the rest of the countries (and groups) for the baseline is shown in table 2. One of the goals of the new US administration is to raise the growth rate to above 3%.

Table 1 Baseline Scenario - Historical and Projected US Expenditure Variables
(Levels in millions of 2010 US dollars)

t	Y	C	G	I	X	M
2010	14964372	10202195	2522209	2752636	1852335	2364992
2011	15204020	10432749	2455280	2831721	1979241	2494406
2012	15542161	10585836	2433697	3027898	2046878	2550025
2013	15802855	10740642	2376129	3147673	2118137	2577739
2014	16208861	11048094	2364881	3283213	2208678	2693714
2015	16672692	11450367	2396385	3434149	2217733	2827336
2016	16920328	11763203	2419591	3386611	2210442	2863265
2017	17292575	12057283	2395395	3551485	2283387	2994975
		Projections				
2018	17576277	11950128	2513456	3505061	2679404	3071772
2019	17864633	12146182	2531235	3562565	2772359	3147708
2020	18157720	12345452	2549307	3621012	2866839	3224890
		Shares	of	GDP		
t	Y	C	G	I	X	M
2010	100.0	68.2	16.9	18.4	12.4	15.8
2011	100.0	68.6	16.1	18.6	13.0	16.4
2012	100.0	68.1	15.7	19.5	13.2	16.4
2013	100.0	68.0	15.0	19.9	13.4	16.3
2014	100.0	68.2	14.6	20.3	13.6	16.6
2015	100.0	68.7	14.4	20.6	13.3	17.0
2016	100.0	69.5	14.3	20.0	13.1	16.9
2017	100.0	69.7	13.9	20.5	13.2	17.3
		Projections				
2018	100.0	68.0	14.2	19.9	15.5	17.6
2019	100.0	68.0	14.0	19.9	15.8	17.8
2020	100.0	68.0	14.0	19.9	15.8	17.8

Table 2. Baseline Expenditure Projections for 2020 (millions of 2010 US\$)

	Y	C	G	I	X	M
USA	18157720	12345452	2549307	3621012	2866839	3224890
China	13413782	4829463	1768785	6380951	3772654	3338071
Mexico	1402996	899887	158562	323657	535136	514245
Canada	1995854	1093169	415102	479214	683386	675016
Japan	6268102	3544675	1202523	1432280	1170501	1081878
Germany	4008543	2130163	747573	770896	2209754	1849843
Rep. Korea	1491057	699186	221036	462589	922578	814332
United Kingdom	2929974	1882170	610169	532102	919766	1014233
India	3230353	1799728	328121	1185440	782397	865333
Italy	2212727	1311278	428847	393641	665946	586985
France	2958561	1619776	692839	674237	980022	1008313
Ireland	399826	130289	47233	91917	518141	387754
Switzerland	683191	361261	77500	153946	506141	415657
Brazil	2454489	1480661	459547	486576	329872	302168
Netherlands	945086	386434	256585	190597	851299	739829
Belgium	546354	274546	126395	130186	504193	488966
Malaysia	422641	204441	60104	107015	328630	277550
Indonesia	1287873	693266	115702	438019	336127	295242
Israel	336010	191766	69846	68964	117512	112078
Russian Fed.	1866339	923829	308089	434288	670538	470404
ROW	13181684	7631536	2222822	3066468	6331881	6071023

III. Scenario 2 10% Reduction in US Imports – No Discrimination

In this scenario, we assume that the US can successfully reduce its imports by 10%. It manages to do this by import substitution. Lower corporate tax rates make increasing domestic investment possible. An attempt is made to revive some industries such as the shoe industry or the automobile industry, where at one time the US was self-sufficient but has lost a good share of the domestic market to globalization. The revival of these industries is done without the intention of targeting any other nations exports to the US, it is simply a reduction of the total imports to the US by modernizing the selected industries. In such a case, we will assume all countries will have the same share of total US imports as in the baseline, but the total imports will be lower. When we iterate this scenario to convergence, we get the result as shown in table 3. For the US, GDP rises to \$ 18919950 as compared to \$ 18157720 in the baseline. The larger GDP implies more revenue for spending on government (both federal and state). However, the

convergence levels also imply a substantial increase in private sector investment, on the order of 6.25% over the period from 2017 to 2020. Under the baseline, the average rate of increase of private investment is only 2.0%. Since, this is in the private sector it may or may not materialize. The increase in investment depends upon the decisions made by the boards of the firms in the industries that have the potential for revitalization.

Because it is the world's largest importer, the 10% reduction in US imports causes reductions in the exports of most countries, but is especially significant in countries which send the bulk of their exports to the US. This in turn lowers their GDP and hence their own imports. Since the US is one of the countries which contributes toward their imports, then US exports are also reduced. For example, consider Canada which sends 76.8% of its exports to the US and Mexico which sends 81.2% of its total exports to the US. Under this scenario, Canada's GDP growth rate decreases by 0.99% as compared to the baseline and Mexico's growth rate is decreased by 0.46%. On the other hand, China's exports to the US are only 18% of its total and Germany exports to the US are only 13.8% of its total exports. China's growth rate increases in this scenario by 1.84%, while the growth rate GDP of Germany decreases by 0.3% . The UK, which sends 16.6 % of its exports to NAFTA also takes decline in the GDP growth rate, a decrease of 0.44% relative to the baseline. The lowering of the UK's GDP also causes a lowering of its import demand, and hence countries whose exports to the UK are an important part of their total exports, such as Australia and India are affected negatively. Italy, which sends 20.9% of its exports to the US and 12.3% of its exports to Germany experiences a decline under this scenario by a 0.33% decrease in the growth rate of GDP relative to the baseline. France, also decreases GDP growth rate 0.29% relative to the baseline.

However, this scenario reduces the 2020 balance of trade deficit for the US from -1.97% under the baseline to -1.53% and the US achieves its goal of a growth rate very close to 3% (one of the administrations goals) of 2.87%.

Table 3. Scenario 2: 10% Reduction in US Imports in 2020 – No Discrimination

2020	Y	C	G	I	X	M
USA	18826402	12800089	2590537	3754361	2790664	3060884
China	13195681	4752593	1740292	6277200	3681180	3280694
Mexico	1358391	873163	153835	313367	509204	489729
Canada	1930215	1057218	401450	463454	652295	643065
Japan	6224908	3522478	1194236	1422410	1144045	1060323
Germany	3973102	2117921	740964	764080	2162129	1810980
Rep. of Korea	1471716	691938	217884	456588	904691	799600
United Kingdom	2890605	1858004	601277	524952	895521	992118
India	3182794	1773468	323592	1167988	763380	851393
Italy	2191457	1301176	426878	389857	651052	578274
France	2932344	1605423	686699	668263	958468	987013
Ireland	393969	129191	47039	90572	502632	381186
Switzerland	674035	357120	76662	151883	495106	406554

Brazil	2437259	1470267	456874	483161	322629	298238
Netherlands	918383	383438	244866	185212	832467	727509
Belgium	616165	303602	140867	146821	494339	469578
Malaysia	414612	200558	58790	104982	322545	272641
Indonesia	1274044	686378	114376	433316	329630	291892
Israel	328429	187446	68673	67408	114157	109628
Russian Federation	1849551	915518	306970	430381	658724	463195
ROW	13013231	7534340	2195698	3027283	6211422	5964955

IV. Scenario 3: A 25% reduction of Road Vehicles and Parts from Non-NAFTA Countries

The results for this scenario are based on the United Nations Trade data (revision 2) of Standard International Trade Classification (SITC). The sum of SITC 0-9 is the total commodity imports of a country. SITC 78 is the commodity trade in Road vehicles, and 784 is a sub-category of 78 which is specifically auto parts and accessories. The countries involved for this scenario are Japan, China, Germany, Republic of Korea, United Kingdom and Italy. Table 4 shows the 2017 commodity imports of the USA from them, as well as the two NAFTA countries.

Table 4. 2017 USA Imports of Road Vehicles and Parts from Major Exporters (millions of \$)

SITC	Mexico	Canada	Japan	China	Germany	R.Korea	UK	Italy	World
0 - 9	317202	305743	139797	525192	119990	73449	53950	51344	2405823
78	85131	56262	51428	29183	27186	20350	9710	6079	309641
784	23667	9490.1	8955.4	10732.8	5284.7	4230.9	419.5	725.2	71298.0
%78	26.8	18.4	36.8	5.6	22.7	27.7	18.0	11.8	12.9
%784	7.5	3.1	6.4	2.0	4.4	5.8	0.8	1.4	3.0

The underlying assumption is that the United States will reduce its imports of SITC 78 from Japan, China, Germany Republic of Korea, the United Kingdom and Italy by 25%. These countries will retaliate by reducing imports from the United States by 25%, although not necessarily in the same SITC. The results are shown in table 5 below.

Table 5. Scenario 3: 25% Reduction in US Imports of SITC 78 from Non-NAFTA Countries

2020	Y	C	G	I	X	M
USA	18009147	12244437	2540146	3591384	2808957	3185765
China	13466782	4848143	1775710	6406163	3794902	3352014
Mexico	1410095	904140	159315	325295	539045	518147
Canada	2007462	1099527	417516	482001	688552	680666
Japan	6253180	3537007	1199660	1428870	1162152	1074432
Germany	4015320	2132503	748837	772199	2217617	1857273
Rep. of Korea	1492661	699788	221298	463087	924094	815555

United Kingdom	2933081	1884077	610871	532666	922406	1015979
India	3247430	1809157	329747	1191707	789062	870339
Italy	2217953	1313761	429330	394570	669505	589126
France	2969796	1625928	695470	676798	989122	1017442
Ireland	413087	132775	47672	94967	523218	383279
Switzerland	686666	362832	77818	154729	510388	419113
Brazil	2461924	1485146	460701	488050	332850	303863
Netherlands	944102	386434	256585	190597	868444	747883
Belgium	477228	245776	112064	113715	435147	429505
Malaysia	426794	206451	60784	108067	331697	280089
Indonesia	1295776	697202	116461	440707	339478	297156
Israel	338332	193089	70205	69441	118505	112829
Russian Fed.	1876059	928640	308737	436549	677250	474577
ROW	13263208	7679070	2235950	3085435	6387493	6122357

We see from Table 5, that the United States reaches a GDP of 18009147 in 2020. This is less than the baseline which is 18157720, and yields a compound growth rate of 1.36% between 2017 and 2020 while the baseline growth rate is 1.64%

V. Scenario 4: 25% Reduction in US Imports of SITC 78 including NAFTA Countries

This scenario has the same reduction of 25% of US imports as in scenario 3 with the addition of Mexico and Canada. Under this scenario we also assume that the countries involved will retaliate with the US. Hence there is an equal value reduction of exports from the US in the imports of Canada and Mexico

Table 6: 25% Reduction in US Imports of SITC 78 including NAFTA Countries

2020	Y	C	G	I	X	M
USA	17991886	12232701	2539082	3587942	2817427	3181220
China	13686188	4925472	1804374	6510535	3901262	3409734
Mexico	1367604	878682	154812	315493	513056	494793
Canada	1968485	1078178	409409	472642	669478	661694
Japan	6298296	3560192	1208315	1439179	1193027	1096945
Germany	4055790	2146482	756385	779982	2267573	1901651
Rep. of Korea	1523798	711458	226372	472746	953314	839272
United Kingdom	2959728	1900434	616890	537506	939887	1030947
India	3298481	1837346	334608	1210441	812649	885303
Italy	2239427	1323961	431318	398390	685600	597920
France	2994373	1639383	701225	682398	1010160	1037410
Ireland	421213	134298	47941	96835	530692	390818
Switzerland	695636	366890	78638	156751	520549	428032

Brazil	2475258	1493189	462770	490693	339243	306904
Netherlands	967879	386434	256585	190597	887166	766718
Belgium	484698	248885	113612	115494	442824	436228
Malaysia	440944	213295	63100	111649	342755	288741
Indonesia	1312288	705427	118045	446323	347894	301155
Israel	342143	195261	70795	70223	120623	114061
Russian Fed	1898466	939731	310230	441763	693519	484198
ROW	13954248	8079166	2347223	3246192	6863170	6557481

The 2020 GDP for the United States is now 17991886 million dollars, lower than in scenario 3. This implies a growth rate of 1.33%, which is a tad lower than scenario 3.

VI. Conclusions

Our model indicates that the United States can reduce its trade balance, but it should not try to reduce it using protectionist policies. Targeting major trading partners with quotas can lead to negative results for all parties concerned. This is especially true for countries like Canada and Mexico whose exports to the US are the bulk of its exports. China and Germany spread their exports globally, and are not as dependent on their exports to the US as Canada and Mexico. Consequently, import sanctions against them do not disrupt their economies as much as sanctions against the NAFTA partners. Nevertheless, sanctions against China and Germany do not help the US situation, because it is unlikely that these sanctions will not be met with retaliation, which can hurt the US more than them. A better approach to closing the trade gap in the United States, is to revitalize those industries that have been given up decades ago. To do this it would be necessary to produce the products that the US now imports more efficiently than the countries that are exporting them to the US. This implies a technological update which lowers domestic costs, but produces products that are acceptable to domestic tastes. This can be done for consumer goods, investment goods as well as for energy products (i.e. solar panels, wind turbines, and shale oil). Likewise, more export promotion of our services and less dependence on foreign suppliers will help. Once the domestic industries become low-cost efficient producers they can then compete in the global market place and the trade balance will naturally correct itself.

References

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Appendix

Table A1. Production Function Parameters

Country	ICOR	I/Y	Growth Rate
United States	12.16	19.94	1.64
China	6.57	47.57	7.24
Mexico	10.32	23.07	2.24
Canada	12.67	24.01	1.90
Japan	34.15	22.85	0.67
Germany	15.53	19.23	1.23
Rep. Korea	8.95	31.02	3.47
United Kingdom	12.08	18.16	1.50
India	4.97	36.67	7.39
Italy	11.86	17.79	1.50
France	22.71	22.78	1.00
Ireland	5.89	22.99	3.91
Switzerland	13.08	22.53	1.72
Brazil	7.52	19.82	2.64
Netherlands	19.04	20.17	1.06
Belgium	17.22	23.83	1.38
Malaysia	4.75	25.32	5.34
Indonesia	5.96	34.01	5.71
Israel	5.10	20.52	4.02
Russia	8.29	23.27	2.81
ROW	7.98	23.26	2.91

Appendix (continued)

Table A2: Demand Functions' Parameters

R-squares and t statistics furnished upon request

	Consumption		Government		Imports	
Country	Intercept	MPC/APC	Intercept	MPG/AGE	Intercept	MPM
U. States	0	0.679901	1429720.397	0.061659	-1556799.56	0.263342
China	101775.3702	0.352545	16341.7446	0.130645	-190746.281	0.263074
Mexico	59315.31449	0.599126	9886.171419	0.10597	-256883.28	0.54963
Canada	0	0.54772	0	0.207982	-296505.676	0.48677
Japan	323529.2473	0.513895	0	0.191848	-2046011.62	0.499017
Germany	745587.7973	0.345406	0	0.186495	-2545681	1.096539
Rep. Korea	140336.8942	0.374801	-21976.1605	0.16298	-321444.257	0.761726
U.K.	83681.38366	0.613824	-51597.4586	0.225861	-631665.115	0.561745
India	16050.16954	0.552162	20523.08616	0.095221	-81541.212	0.293118
Italy	260257.4676	0.474989	224069.8183	0.092545	-319214.944	0.40954
France	0	0.547488	0	0.234181	-1395455.18	0.812479
Ireland	55337.95981	0.187459	33996	0.033106	-60595.8229	1.121362
Switzerland	52262.58828	0.452287	15007.82071	0.091471	-263657.509	0.994327
Brazil	0	0.603246	78696.52141	0.155165	-257556.508	0.228041
Netherlands	280400.2775	0.112195	-158153.954	0.438837	0	0.792163
Belgium	47154.26103	0.416199	13127.67481	0.207314	0	0.762097
Malaysia	0	0.483724	-9075.52852	0.163684	19136.66392	0.611425
Indonesia	51798.23967	0.498083	-7861.18364	0.095944	-16673.4433	0.242194
Israel	281.6945792	0.569878	17870.93307	0.154683	3443.378561	0.323309
Russia	0	0.494995	183682.357	0.066658	-330987.556	0.429392
ROW	0	0.578975	100267.99	0.161023	-2229034.5	0.629666