

Measuring the Impact of the Steel Tariffs on the US Economy

by

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Abstract

In March 2018, President Donald Trump signed Proclamations imposing a tariff of 25 percent on US imports of steel from all countries excluding Canada and Mexico. The tariff is a response to years of foreign producers dumping their product on the US market, causing severe declines in the domestic steel industry. Many forecasts predicted calamitous results for the overall job market and GDP. The most egregious estimates predicted as many as 432,747 jobs lost throughout the US economy and a 0.2 percent reduction in GDP.¹ Many Coalition for a Prosperous America (CPA) members are involved in steelmaking or steel-intensive manufacturing industries, and what they were telling us and what the government statistics show are quite opposite to those predictions. Using the REMI macroeconomic model, a well-regarded and widely used economic policy tool, CPA set out to produce our own forecasts and determine why other forecasts are so inaccurate. After updating the model to reflect actual baseline GDP and total employment in 2018, importing CBO forecasts for GDP and employment over 2019-2021, adjusting prices to reflect the current low-inflation environment, and implementing announced industry plans regarding investment in the steel producing industry, we produce results that are closer to the actual economic outcomes we are witnessing since the tariffs were applied. Additionally, we look at two policy options for recycling the estimated \$5 Billion in steel tariff revenue from the Treasury to the private sector.

¹ Policy Brief, Round 3: ‘Trade Discussion’ or ‘Trade War’? The Estimated Impacts of Tariffs on Steel and Aluminum. Dr. Joseph Francois, Laura M. Baughman and Daniel Anthony. (June 5, 2018), Trade Partnership Worldwide, LLC/The Trade Partnership.

In March 2018, President Donald Trump signed Proclamations imposing a tariff of 25 percent on US imports of steel from all countries excluding Canada and Mexico. During this time many forecasts were published on the impact these tariffs would have on total employment, prices, and GDP. These dire estimates, it turns out, have not come to fruition. After monitoring monthly data in 2018 on GDP and employment, it became apparent that many of these forecasts were unrealistic. Thus, we set out to determine why the economy is reacting to the tariff in ways the forecasters models failed to predict. We chose to use the Regional Economic Modeling Inc's (REMI) US macroeconomic model to estimate the impact of the steel tariffs on the US economy. The model is widely used by research institutes, think tanks, consultants, and state and local governments throughout the US to study a variety of policy questions. Working with the REMI model, as opposed to creating our own, eliminates any doubts as to the theoretical foundation of our modeling efforts.

This paper is organized as follows: 1) The baseline forecast and adjustments; 2) Steel tariff simulation; 3) Addition of exogenous investment and employment; 4) Adjustment to 2018 prices; 5) Recycling tariff revenue - Automobile manufacturing rebate; 6) Recycling tariff revenue - Steel-intensive manufacturing rebate; and 7) Concluding remarks.

Baseline Model Forecast¹

The REMI PI+ v2.2 economic model has a pre-defined national baseline model from which a regional policy model baseline is created. Table 1 shows the REMI regional policy baseline for GDP, total employment, manufacturing employment, and employment in the iron and steel mills and ferroalloy manufacturing sector. REMI allows the user to create their own

baseline forecast using their own assumptions. We first put in 2017 actuals for GDP (BEA reported \$19,831.829 Billion and convert it to chained (2009) dollars, \$17,096.6 Billion), and total employment of 199,821,000. We then incorporated the GDP and employment growth assumptions from the Congressional Budget Office April 2018 report to Congress.² The CBO assumes GDP growth of 3.0% (2018), 2.9% (2019), 2.0% (2020), and 1.5% in 2021. The CBO forecast shows nonfarm payroll employment increases by 211,000 jobs per month (1.27% per year) in 2018, 62,000 per month (0.37% per year) in 2019 and 2020, and 30,000 jobs per month (0.18%) in 2021. These assumptions are shown in table 2.

Based on these assumptions, we run a new national baseline forecast in REMI. The model calibrates as closely as possible to match the employment and GDP assumptions. According to REMI, it is typically possible to hit either employment or GDP but not both during the model calibration. Nevertheless, this national baseline exhibits year-on-year growth in GDP and total employment more accurate for 2018 than the standard REMI baseline model. Table 3 shows the results of the calibration for the new national baseline.

After a national baseline forecast is run, the REMI model requires that a regional baseline forecast is run off the national baseline forecast. The resulting regional baseline forecast is shown in table 4. Neither GDP nor total employment match the input assumptions, but the relative year-on-year growth rates are close to the CBO assumptions in the base year.

Steel Tariff Simulation.

The announced tariff is 25 percent on steel. In our simulation we assume that the impact on the price of imported steel is 12.5 percent in 2018 and 25 percent thereafter. This is a

² The Budget and Economic Outlook: 2018 to 2028, April 9, 2018. Congressional Budget Office

reasonable assumption given that many steel users have locked in prices ahead of the tariff imposition and it is close to the average price increase steel users have experienced in 2018. Table 5 shows the impact of the tariff on GDP and employment as well as the change relative to the regional baseline. GDP declines 0.11 percent on average over our forecast period 2019 to 2021. Total employment is lower by 137,000 jobs in 2018 and 266,000 jobs on average from 2019-2021. As economic theory predicts, output and employment in iron and steel mills and ferroalloy manufacturing increases in every year. Prior to the imposition of the tariff, iron and steel and ferroalloy manufacturers, were producing at less than full capacity. With the tariff in place, domestic producers can compete with imports, and their output increases without requiring additional productive capacity. Output in the sector increases as follows: 1.67% (2018), 2.77% (2019), 2.55% (2020) and 2.43% in 2021.

Exogenous Investment and Employment in the Iron/Steel Sector

Output and employment in iron and steel mills and ferroalloy manufacturing increased in response to increased steel prices. However, management at multiple steel producers determined that the business environment for their products is improving and announced expansions of existing production facilities and construction of new facilities. Compiling these announcements yields a total of new exogenous investment of approximately \$3.024 Billion with 3,382 new jobs. Table 6 shows the various announcements by producers for new and expanded production, the number of new jobs, as well as the timeline for construction. New capacity is introduced in the model by adding exogenous investment to iron and steel mills and ferroalloy manufacturing. The investment is split evenly into non-residential facilities and equipment and we allocate it over three years: 25% (\$756 Million) in 2018, 50% (\$1.512 Billion) in 2019, and 25% (\$756

Million) in 2020. The new jobs enter the model as exogenous employment into the sector as follows: 846 jobs (25%) in 2018, 1,691 (50%) in 2019, and 846 in 2020.

Relative to the result which includes only the imposition of the tariff, the results, shown in table 7, include an increase GDP of \$1.36 Billion in 2018, \$2.5 Billion in 2019, and \$1 Billion in 2020. Total employment is higher in 2018 by 15,068, in 2019 by 26,960, and in 2020 by 10,412. The net result of the tariff plus new exogenous investment and jobs is still negative in terms of GDP and total employment relative to the CPA baseline without the tariffs.

Adjusting Prices in the Model

Price changes year-on-year 2017 to 2018, for the 75 commodity consumption categories in the model are not reflective of actual price changes we are witnessing in late 2018. We update the year-on-year price changes from 2017 to 2018 using October 2018 CPI data from the BLS.³ For the years 2019 to 2021, the year-on-year price changes in the model are applied to the adjusted 2018 prices. For example, the consumption category “new motor vehicles” has a 2018 price increase of 2.063% in the model. BLS data indicates that new motor vehicle prices have increased just 0.5% in the year to October 2018, so we reduce the price change in 2018 by -1.563%. If prices for a category are higher than model estimates, we increase prices and vice-versa for prices that are lower than model estimates. We have not modified the model’s annual price changes for the years 2019-2021. Table 8 shows the adjusted prices and forecasts for all 75 commodity consumption categories.

The modified model results, with the adjusted 2018 prices, shown in table 9, are much closer to what we are seeing today in the US economy. The modified model shows GDP growth

³ News Release, Bureau of Labor Statistics, US Department of Labor, Consumer Price Index – October 2018.

in 2018 up 3.53%, total employment increased 2.14%, and manufacturing employment up 2.46%, with employment in iron and steel mills and ferroalloy manufacturing up 2.76%. From 2019 onward, GDP growth is still robust but increasing at a declining rate. Total employment retreats in 2019 but resumes its upward growth through 2021. Employment in manufacturing begins to decrease as the increased prices (particularly prices related to petroleum) percolate through the economy. Going forward, this version of the model will be used as our policy baseline from which we will look at options for recycling the tariff revenue from the treasury to the private sector.

Recycling Tariff Revenue: Automobile Manufacturing Rebate

Revenue from the steel tariff is estimated to be approximately \$5 billion per year. We assume the government recycles this revenue to automobile manufacturers as a subsidy to their production costs. This is implemented in the model by reducing the production cost of new automobiles by \$5 billion per year. Because automobile manufacturing is a major component to GDP in the US and pays relatively good wages, average GDP is higher by an average of \$24.09 billion per year (about 0.1% of GDP) over the period 2019-2021. Employment in automobile manufacturing increases on average by 5,530 over the same period. Total employment is up 253,300 jobs per year as the multiplier effects of the subsidy stimulate the overall economy creating more jobs. The results are shown in table 10. The simulation shows that the federal government could generate even better growth and employment outcomes by rebating steel tariff revenue to the auto industry (purchasers of automobiles would share in the benefit of the rebate through lower auto prices).

Recycling Tariff Revenue: Steel-intensive Manufacturing Rebate

In this alternative rebate simulation, we recycle the tariff revenue to steel-intensive manufacturers. These include 11 sectors in the model: 1) Steel product manufacturing from purchased steel; 2) foundries; 3) forging and stamping; 4) cutlery and hand tool manufacturing; 5) architectural and structural metals manufacturing; 6) boiler, tank, and shipping container manufacturing; 7) hardware manufacturing; 8) spring and wire product manufacturing; 9) machine shops, turned product and screw, nut, and bolt manufacturing; 10) coating, engraving, heat treating, and allied activities; and 11) other fabricated metal product manufacturing. We allocate the \$5 Billion of recycled tariff revenue to each of these sectors based on their share of combined output in each year. For example, forging and stamping in 2019 produces 10.55% of all output among the steel intensive manufacturers. Applying 10.55% to \$5 billion results in a subsidy of \$511.3 million dollars. The allocation weights and subsidies are shown in table 11 and the results of the simulation are in table 12.

Much like the automobile manufacturing subsidy, the recycled tariff revenue results in substantial increases in GDP, employment in these industries and total employment. Over the period 2019-2021, GDP increases an average of \$23.6 billion, a multiplier of 4.72 on the \$5 billion rebate. The average number of new jobs created in these sectors combined is 30,039. For every new job generated, 8.6 jobs are added to the total economy, for an average increase of 257,800 jobs per year.

In terms of GDP, both rebate policies are virtually equivalent in an \$18.3 trillion economy. The automobile manufacturing subsidy adds an annual average of \$500 million more to GDP than does subsidizing the steel-intensive manufacturing industries. However, on average, the subsidy to steel-intensive manufacturers produces 4,500 more jobs per year than subsidizing

automobile manufacturing. In terms of multipliers, the automotive manufacturers produce 4,500 more jobs for every one job created in their industry than do steel-intensive manufacturers. The takeaway from this is that the average wage effects are larger when subsidizing the automotive manufacturers but in terms the number of jobs (albeit at lower average wages) the rebate to steel-intensive manufacturers performs better.

Conclusion

Many of the published estimates as to the negative economic impact of the imposition of a 25 percent tariff on imported steel differ greatly from what we are seeing in the current economic environment. Modeling the tariffs in the REMI model, we can replicate these dire estimates. However, this is only the case when holding all other things in the model constant. When the REMI model: 1) is updated to more accurately reflect the base year data for GDP and employment; 2) uses updated assumptions regarding future growth in GDP and employment; 3) includes reactions to the tariffs on the part of management in iron and steel and ferroalloy manufacturing; and 4) uses updated estimates of inflation to match actual prices changes in the base year, the model produces different results altogether. Our results forecast 3.5 percent growth in GDP compared to year on year growth as of Q3 2018 of 3.04%.⁴ Total employment is forecast to increase 2.14% compared to actual annualized growth of 1.71%.⁵ Manufacturing employment rises 2.46%, with employment in iron and steel mills and ferroalloy manufacturing up 2.76%. From 2019 onward, we show GDP growth is still robust but increasing at a declining rate. Total

⁴ Per BEA, real GDP was \$18,120.8 billion as of Q3-2017 and \$18,671.5 billion in Q3-2018, an increase of 3.04%

⁵ Per FRED, growth in employment from December 31, 2017 to October 31, 2018 was 1.41%. Annualizing this forecast using month-on-month changes from October to December 2017 we arrive at an annualized rate of 1.71%.

employment retreats in 2019 but resumes its upward growth through 2021. Employment in manufacturing begins to decrease as the increased prices (particularly prices related to petroleum) percolate through the economy.

All models necessarily simplify the behavior of a complex economy. Traditional trade models emphasize price effects and determine prices through inflexible input-output tables. They can also underestimate investment decisions made by industries that receive tariff protection. By using actual data, we have modified a standard model to generate results that better approximate the observable current performance of the US economy.

Table 1 - REMI Regional Baseline Forecast

Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,149.56	\$17,579.53	\$18,035.27	\$18,318.64	\$18,527.54
	% Change YOY		2.51%	2.59%	1.57%	1.14%
Total Employment	Thousands (Jobs)	197,649	201,064	203,310	202,843	201,742
	% Change YOY		1.73%	1.12%	-0.23%	-0.54%
Manufacturing Employment	Thousands (Jobs)	13,254.41	13,491.68	13,485.42	13,267.66	13,024.54
	% Change YOY		1.79%	-0.05%	-1.61%	-1.83%
Iron and Steel Mills and Ferroalloy Manufacturing	Thousands (Jobs)	86.053	86.532	85.306	82.779	80.104
	% Change YOY		0.56%	-1.42%	-2.96%	-3.23%

Table 2 - CBO's Economic Projections for Calendar Years 2018 to 2021						
Category	Units	2017	2018	2019	2020	2021
GDP CBO Projection	% Change		3.0%	2.9%	2.0%	1.5%
	Billions of Chained (2009) Dollars	17,096.1	17,609.9	18,120.9	18,483.5	18,760.9
Employment Total CBO Projection	Jobs per month	181,000	211000	62000	62000	30000
	1000's jobs	199,821	202,353	203,097	203,841	204,201
	% change		1.27%	0.37%	0.37%	0.18%

Table 3 – CPA Baseline Forecast Relative to CBO Assumptions						
Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,096	\$17,547	\$18,033	\$18,370	\$18,637
	% Change YOY		2.64%	2.77%	1.87%	1.45%
	Delta to CBO Assumptions	(\$0.11)	(\$62.44)	(\$87.95)	(\$113.11)	(\$124.11)
Total Employment	Thousands (Jobs)	199822	202354	203098	203842	204202
	% Change YOY		1.27%	0.37%	0.37%	0.18%
	Delta to CBO Assumptions	0.65	0.77	0.74	0.91	0.83

Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,099	\$17,520	\$18,000	\$18,346	\$18,623
	% Change YOY		2.46%	2.74%	1.92%	1.51%
	Delta to REMI Baseline	(\$51)	(\$60)	(\$35)	\$27	\$95
Total Employment	Thousands (Jobs)	199900	202071	202742	203547	203987
	% Change YOY		1.09%	0.33%	0.40%	0.22%
	Delta to REMI Baseline	2251	1007	-567	704	2245
Manufacturing Employment	Thousands (Jobs)	13405.465	13558.58	13446.85	13312.96	13168.89
	% Change YOY		1.14%	-0.82%	-1.00%	-1.08%
	Delta to REMI Baseline	151.05	66.90	-38.57	45.31	144.35
Iron and Steel Mills and Ferroalloy Manufacturing	Thousands (Jobs)	87.06	86.865	84.943	82.965	80.923
	% Change YOY		-0.22%	-2.21%	-2.33%	-2.46%
	Delta to REMI Baseline	1.007	0.333	-0.363	0.186	0.819

Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,099	\$17,508	\$17,978	\$18,321	\$18,597
	% Change YOY		2.39%	2.68%	1.91%	1.51%
	Delta to CPA Baseline	\$0	(\$11)	(\$22)	(\$25)	(\$25)
Total Employment	Thousands (Jobs)	199900	201935	202487	203276	203716
	% Change YOY		1.02%	0.27%	0.39%	0.22%
	Delta to CPA Baseline	0	-137	-256	-271	-271
Manufacturing Employment	Thousands (Jobs)	13405.465	13549.35	13427.54	13289.78	13143.66
	% Change YOY		1.07%	-0.90%	-1.03%	-1.10%
	Delta to CPA Baseline	0.00	-9.23	-19.31	-23.18	-25.24
Iron and Steel Mills and Ferroalloy Manufacturing	Thousands (Jobs)	87.06	88.321	87.297	85.09	82.898
	% Change YOY		1.45%	-1.16%	-2.53%	-2.58%
	Delta to CPA Baseline	0	1.456	2.354	2.125	1.975

Table 6 – Announced New Iron and Steel and Ferroalloy Manufacturing Capacity and Jobs							
Company	Product	Output	Jobs	\$ Investment	City	State	Date of Construction
Nucor	Rebar	350000	250	\$240,000,000.00	Frostproof	FL	2018, 2019
Nucor	Merchant Bar Quality	500000	50	\$180,000,000.00	Bourbonnais	IL	2018, 2019
Nucor	Rebar		250	\$250,000,000.00	Sedalia	MO	2019
Kobe Steel and U.S. Steel	Galvanized Steel	500000	80	\$240,000,000.00	Leipsic	OH	2018, 2019
Steel Dynamics	Rebar	240000	33	\$75,000,000.00	Columbia City	IN	2018
Nucor	Hot Band Galvanized	500000	75	\$176,000,000.00	Ghent	KY	2018, 2019
Nucor	Steel Bar	400000	15	\$85,000,000.00	Marion	Oh	2018, 2019
Charter Steel	Special Bar Quality		25	\$150,000,000.00	Cuyahoga Heights	OH	2018
Steel Dynamics	Rebar	1000000	15	\$28,000,000.00	Roanoke	VA	2018 2020
Nucor	Hi strength Steel		100	\$230,000,000.00	Blytheville	AR	2018, 2019
Skyline Steel (Nucor)	welded pipe		15	\$15,000,000.00	Luka	MS	2018
Steel Dynamics	New Galvanizing Line	400000	45	\$140,000,000.00	Fort Wayne	IN	2018 2020
JSW Group	Steel Plant		500	\$500,000,000.00	Baytown	TX	2018 2020
Feldmeier Steel	Tank Factory		99	\$15,000,000.00	Dewitt	NY	2018
Allegheny Technologies Joint Venture with Tsingshan Stainless			100		Midland	PA	2018 2020
U.S. Steel	Reopen Blast Furnace			\$ -	Granite City	IL	
Tenaris Steel	Pipe Mill	600000	600		Bay city	TX	
Republic Steel	Special Bar Quality		1000		Lorain	OH	
Cleveland Cliffs Inc	Iron Making Hot Briquetted Iron	1600000	130	\$700,000,000.00	Toledo	OH	2017 2018
Total			3382	\$3,024,000,000			

Table 7 - CPA Regional Forecast -Steel Tariff + Exogenous Investment and Employment						
Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,099	\$17,510	\$17,980	\$18,322	\$18,597
	% Change YOY		2.40%	2.69%	1.90%	1.50%
	Delta to CPA Baseline		(\$10)	(\$20)	(\$24)	(\$26)
Total Employment	Thousands (Jobs)	199900	201950	202514	203287	203713
	% Change YOY		1.03%	0.28%	0.38%	0.21%
	Delta to CPA Baseline		-121	-229	-261	-274
Manufacturing Employment	Thousands (Jobs)	13405.465	13551.06	13430.67	13291.1	13143.43
	% Change YOY		1.09%	-0.89%	-1.04%	-1.11%
	Delta to CPA Baseline		-7.52	-16.18	-21.86	-25.46
Iron and Steel Mills and Ferroalloy Manufacturing	Thousands (Jobs)	87.06	88.432	87.512	85.196	82.897
	% Change YOY		1.58%	-1.04%	-2.65%	-2.70%
	Delta to CPA Baseline		1.567	2.569	2.231	1.974

Table 8 - Adjustments to Consumption Commodity Prices					
		2018	2019	2020	2021
1	New motor vehicles	-1.65247	-1.5193	-1.6515	-1.7746
2	Net purchases of used motor vehicles	-3.8	-3.4608	-3.6853	-3.7241
3	Motor vehicle parts and accessories	-2	-1.5486	-1.772	-1.8959
4	Furniture and furnishings	-1.2	-1.3451	-1.6447	-1.5954
5	Household appliances	1	0.907	0.7161	0.7628
6	Glassware, tableware, and household utensils	-5.2	-5.154	-5.5753	-5.5247
7	Tools and equipment for house and garden	-1.6	-1.2569	-1.5073	-1.5535
8	Video, audio, photographic, and information processing equipment and media	0.1	-0.6573	-0.7942	-0.9222
9	Sporting equipment, supplies, guns, and ammunition	-5.5	-5.5563	-5.7445	-5.9204
10	Sports and recreational vehicles	-0.3	0.0186	-0.0277	-0.1569
11	Musical instruments	-3.4	-2.9391	-3.1739	-3.2163
12	Jewelry and watches	-5.3	-4.7793	-4.9941	-5.0296
13	Therapeutic appliances and equipment	-1.8	-1.3779	-1.712	-1.7543
14	Books, educational and recreational	-2.8	-2.0946	-2.3827	-2.4943
15	Luggage and similar personal items	-5.8	-5.8355	-6.1152	-6.1704
16	Telephone and facsimile equipment	-0.9	-1.5078	-1.7841	-1.8901
17	Food and nonalcoholic beverages purchased for off-premises consumption	-1.1	-0.5114	-0.7313	-0.8538
18	Alcoholic beverages purchased for off-premises consumption	0.2	0.5804	0.3475	0.2173
19	Food produced and consumed on farms	0	0	0	0
20	Men's and boys' clothing	-1.4	-1.0355	-1.27	-1.3124
21	Women's and girls' clothing	-3.3	-2.8815	-3.2161	-3.2584
22	Children's and infants' clothing	-1.2	-0.7904	-1.1263	-1.1686
23	Other clothing materials and footwear	-2.9	-2.5608	-2.7853	-2.8241
24	Motor vehicle fuels, lubricants, and fluids	7	7.3837	7.1187	6.967
25	Fuel oil and other fuels	13.7	13.7962	13.4959	13.4308
26	Pharmaceutical and other medical products	-1.5	-0.744	-0.9358	-1.0405
27	Recreational items	-10.1	-10.2518	-10.4396	-10.5051
28	Household supplies	0	0	0	0
29	Personal care products	0	0	0	0
30	Tobacco	0.3	1.3118	1.0617	0.9669
31	Magazines, newspapers, and stationery	-0.1	0.4558	0.1612	0.2102
32	Net expenditures abroad by U.S. residents	0	0	0	0
33	Rental of tenant-occupied nonfarm housing	1	1.9793	1.6064	1.4108
34	Imputed rental of owner-occupied nonfarm housing	0	0	0	0

35	Rental value of farm dwellings	0	0	0	0
36	Group housing	1.2	1.9452	1.5831	1.5537
37	Water supply and sanitation	0.4	1.3224	1.084	0.9941
38	Electricity	-3.5	-2.904	-3.3164	-3.3589
39	Natural gas	-3	-2.9462	-3.3739	-3.3277
40	Physician services	-1.8	-1.5128	-1.7422	-1.7807
41	Dental services	-0.6	0.1723	-0.1853	-0.1342
42	Paramedical services	-0.3	0.0287	-0.2847	-0.2337
43	Hospitals	1.3	1.7558	1.4612	1.4291
44	Nursing homes	1.3	1.8475	1.5519	1.4384
45	Motor vehicle maintenance and repair	-0.3	0.2459	0.0333	-0.0838
46	Other motor vehicle services	0.5	0.7373	0.5826	0.438
47	Ground transportation	1.4	2.0754	1.797	1.7675
48	Air transportation	-3	-2.2776	-2.6436	-2.5944
49	Water transportation	-2.2	-1.8276	-2.0584	-2.0968
50	Membership clubs, sports centers, parks, theaters, and museums	-0.1	0.5051	0.2867	0.0821
51	Audio-video, photographic, and information processing equipment services	-1.3	-0.5077	-0.8792	-0.9117
52	Gambling	0	0	0	0
53	Other recreational services	-0.7	-0.0293	-0.3082	-0.3377
54	Purchased meals and beverages	-0.3	0.3392	0.0564	0.0273
55	Food furnished to employees (including military)	-0.5	0.259	-0.0087	-0.0355
56	Accommodations	-2.5	-1.7654	-2.0497	-2.1603
57	Financial services furnished without payment	0	0	0	0
58	Financial service charges, fees, and commissions	2.6	3.4813	3.3092	3.2178
59	Life insurance	0	0	0	0
60	Net household insurance	-1	-0.1082	-0.4622	-0.5676
61	Net health insurance	-1.6	-0.8288	-1.2041	-1.2364
62	Net motor vehicle and other transportation insurance	3.8	4.751	4.4064	4.3794
63	Telecommunication services	-1.7	-1.448	-1.7169	-1.7718
64	Postal and delivery services	0.1	0.6814	0.4916	0.3876
65	Internet access	-1.2	-0.8182	-1.1617	-1.2079
66	Higher education	-0.4	0.4435	0.2678	0.1731
67	Nursery, elementary, and secondary schools	-0.7	0.2061	-0.0561	-0.1562
68	Commercial and vocational schools	-0.9	-0.1592	-0.3522	-0.5326
69	Professional and other services	-1.8	-1.0185	-1.2961	-1.3256
70	Personal care and clothing services	-0.5	0.3712	-0.0041	-0.1163
71	Social services and religious activities	0	0	0	0
72	Household maintenance	2	2.6	2.3124	2.2837

Table 8 cont'd - Adjustments to Consumption Commodity Prices					
73	Foreign travel by U.S. residents	0	0	0	0
74	Expenditures in the United States by nonresidents	0	0	0	0
75	Final consumption expenditures of nonprofit institutions serving households	0	0	0	0

Table 9 - CPA Policy Baseline -Steel Tariff + Exogenous Investment and Employment + Price Adjustment						
Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,099	\$17,702	\$18,076	\$18,478	\$18,756
	% Change YOY		3.53%	2.11%	2.22%	1.51%
	Delta to CPA Baseline		182	76	132	133
Total Employment	Thousands (Jobs)	199,900	204,171	203,502	204,957	205,407
	% Change YOY		2.14%	-0.33%	0.72%	0.22%
	Delta to CPA Baseline		2100	759	1410	1420
Manufacturing Employment	Thousands (Jobs)	13,405.465	13,735.27	13,554.52	13,447.39	13,297.18
	% Change YOY		2.46%	-1.32%	-0.79%	-1.12%
	Delta to CPA Baseline		176.68	107.67	134.42	128.29
Iron and Steel Mills and Ferroalloy Manufacturing	Thousands (Jobs)	87.06	89.459	88.232	86.072	83.75
	% Change YOY		2.76%	-1.37%	-2.45%	-2.70%
	Delta to CPA Baseline		2.594	3.289	3.107	2.827

Table 10 - CPA Regional Forecast -Steel Tariff + Exogenous Investment and Employment + Price Adjustment + Auto Rebate						
Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,099	\$17,727	\$18,100	\$18,502	\$18,779
	% Change YOY		3.67%	2.11%	2.22%	1.50%
	Delta to CPA Policy Baseline		\$25	\$24	\$24	\$23
Total Employment	Thousands (Jobs)	199900	204443	203758	205210	205640
	% Change YOY		2.27%	-0.34%	0.71%	0.21%
	Delta to CPA Policy Baseline		272	256	253	232
Manufacturing Employment	Thousands (Jobs)	13405.465	13762.56	13581.31	13473.79	13322.14
	% Change YOY		2.66%	-1.32%	-0.79%	-1.13%
	Delta to CPA Policy Baseline		27.29	26.79	26.40	24.96
Iron and Steel Mills and Ferroalloy Manufacturing	Thousands (Jobs)	87.06	89.669	88.442	86.273	83.937
	% Change YOY		3.00%	-1.37%	-2.45%	-2.71%
	Delta to CPA Policy Baseline		0.21	0.21	0.201	0.187

Table 11 - Rebate Allocation to Steel-Intensive Industries (\$Billions)						
	2108	2019	2020	2021	2022	2023
Steel product manufacturing from purchased steel	(0.293)	(0.292)	(0.292)	(0.291)	(0.290)	(0.289)
Foundries	(0.341)	(0.339)	(0.336)	(0.334)	(0.331)	(0.329)
Forging and stamping	(0.510)	(0.511)	(0.512)	(0.513)	(0.513)	(0.514)
Cutlery and hand tool manufacturing	(0.133)	(0.135)	(0.137)	(0.139)	(0.141)	(0.143)
Architectural and structural metals manufacturing	(1.054)	(1.045)	(1.040)	(1.034)	(1.027)	(1.019)
Boiler, tank, and shipping container manufacturing	(0.528)	(0.528)	(0.527)	(0.526)	(0.526)	(0.528)
Hardware manufacturing	(0.099)	(0.099)	(0.099)	(0.099)	(0.099)	(0.098)
Spring and wire product manufacturing	(0.106)	(0.107)	(0.109)	(0.110)	(0.111)	(0.112)
Machine shops; turned product; and screw, nut, and bolt manufacturing	(0.946)	(0.948)	(0.949)	(0.950)	(0.951)	(0.953)
Coating, engraving, heat treating, and allied activities	(0.372)	(0.374)	(0.377)	(0.379)	(0.382)	(0.385)
Other fabricated metal product manufacturing	(0.618)	(0.622)	(0.624)	(0.627)	(0.629)	(0.631)
Total	(5.000)	(5.000)	(5.000)	(5.000)	(5.000)	(5.000)

Table 12 - CPA Regional Forecast -Steel Tariff + Exogenous Investment and Employment + Price Adjustment + Steel Rebate						
Category	Units	2017	2018	2019	2020	2021
Gross Domestic Product	Billions of Chained (2009) Dollars	\$17,099	\$17,725	\$18,100	\$18,502	\$18,779
	% Change YOY		3.66%	2.11%	2.22%	1.50%
	Delta CPA Policy Base	\$0	\$23	\$24	\$24	\$23
Total Employment	Thousands (Jobs)	199900	204441	203763	205217	205647
	% Change YOY		2.27%	-0.33%	0.71%	0.21%
	Delta CPA Policy Base	0	270	261	260	240
Manufacturing Employment	Thousands (Jobs)	13405.465	13761.43	13581.94	13475.52	13324.56
	% Change YOY		2.66%	-1.30%	-0.78%	-1.12%
	Delta CPA Policy Base	0	26.163	27.418	28.137	27.387
Iron and Steel Mills and Ferroalloy Manufacturing	Thousands (Jobs)	87.06	89.704	88.493	86.335	84.007
	% Change YOY		3.04%	-1.35%	-2.44%	-2.70%
	Delta CPA Policy Base	0	0.245	0.261	0.263	0.257