

Maximizing job-creation bang-for-buck by reducing import leakages

How many more jobs would be supported by infrastructure investments if import shares were lower in domestic manufacturing?

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Americans across the political spectrum consistently express support for major infrastructure investments.¹ A large, sustained increase in infrastructure investment would benefit the U.S. economy in many ways (see Bivens 2018 for an overview of the benefits), yet no serious increase in infrastructure spending has yet occurred.

This policy memo focuses on one major economic argument in favor of increased infrastructure investment—that it would increase demand for American manufactured goods and, in turn, generate American manufacturing jobs. As this memo shows, more jobs will be created if policymakers take steps to reduce the yawning U.S. trade deficit that allows jobs to “leak” outside the U.S. economy as U.S. spending increases.

Spending in any given economic sector sets off ripple effects, or linkages, across other sectors.² For example, an increase in demand for construction-sector output supports construction jobs directly but also supports jobs in industries that supply inputs to the construction sector. Take the case of a large infrastructure project that includes constructing intercity rail transportation. Such a project would create direct jobs in construction (jobs building tunnels and bridges and track beds, and the like). But the project would also create indirect jobs in the industries supplying the wide range of inputs required—such as construction equipment and tools, steel and concrete, and services rendered by environmental and information technology consultants.

The number of direct and indirect jobs supported by an increase in economywide spending depends in

part on how much of this spending goes to purchase imports rather than domestically produced goods and services. In the case of infrastructure investments specifically, the number of U.S. manufacturing jobs supported depends on the share of purchased manufacturing inputs that is produced domestically as opposed to being imported from abroad.

The larger the share of imported inputs, the smaller the number of supplier jobs supported in domestic manufacturing. This policy memo provides an illustrative example of how many manufacturing jobs would be supported under the status quo (i.e., if the import share remains high due to the current large trade deficit) and under an alternative scenario in which the share of manufacturing inputs imported from abroad drops by a third due to a sizable decrease in the manufacturing trade deficit.

We find that by cutting the manufacturing trade deficit to a more sustainable level (by roughly two-thirds), tens of thousands of additional U.S. manufacturing jobs would be supported by any ambitious investment in infrastructure. There are many reasons why we should use the levers of policy to put American manufacturing production on a more-level playing field with global competitors. These policy levers—whether they are moves to ensure that the value of the U.S. dollar falls to a more competitive level in global markets, to stringently enforce trade laws, or to enact “Buy America” provisions that mandate some level of domestic content in government procurement—can help maximize the job creation spurred by infrastructure investment in communities across the country.

Background on infrastructure investments and trade shares in manufacturing

Currently, federal government financing supports roughly \$350 billion per year in U.S. transportation and water infrastructure, either directly or through transfer of fiscal resources (grants or loan guarantees or tax exemptions) to state and local governments.³ It has been widely argued that this is insufficient and that a much larger infrastructure investment effort should be pursued.⁴ This policy memo considers the employment impact of a \$150 billion increase in infrastructure investment that would raise annual infrastructure spending up to \$500 billion.

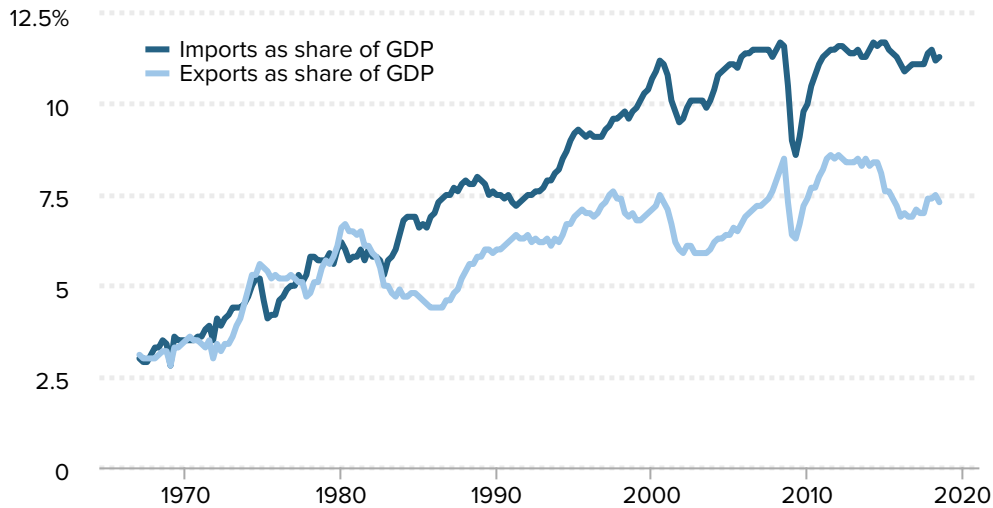
A commonly used proxy for manufacturing trade flows includes goods imports and exports, but excludes agricultural goods from exports and excludes petroleum products from imports.⁵ **Figure A** shows manufacturing exports and imports as a share of total U.S. gross domestic product (GDP). The gap between imports and exports is the trade deficit in manufacturing goods expressed as a share of GDP. What stands out from this figure is the large trade deficit in American manufacturing.

While the trade deficit in manufactured goods is substantial when expressed as a share of overall GDP, it is much bigger when expressed as the share of *domestic consumption of*

Figure A

Import growth dwarfs export growth in manufactured goods

Manufacturing exports and imports as shares of U.S. gross domestic product (GDP), 1967–2018



Note: Manufacturing exports are proxied by goods exports, excluding agricultural products. Manufacturing imports are proxied by goods imports, excluding petroleum products.

Source: Bureau of Economic Analysis (BEA) import and export data (BEA 2019a, 2019b) and National Income and Product Accounts data (BEA 2018)

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manufactured goods. Domestic consumption is measured as domestic *production* in manufacturing plus imports of manufactured goods minus exports of manufactured goods. If trade were balanced, then domestic consumption would equal domestic production. When instead the U.S. runs a manufacturing trade deficit, this means that domestic production falls short of domestic consumption and hence manufacturing employment is depressed, even as Americans consume evermore manufactured goods.

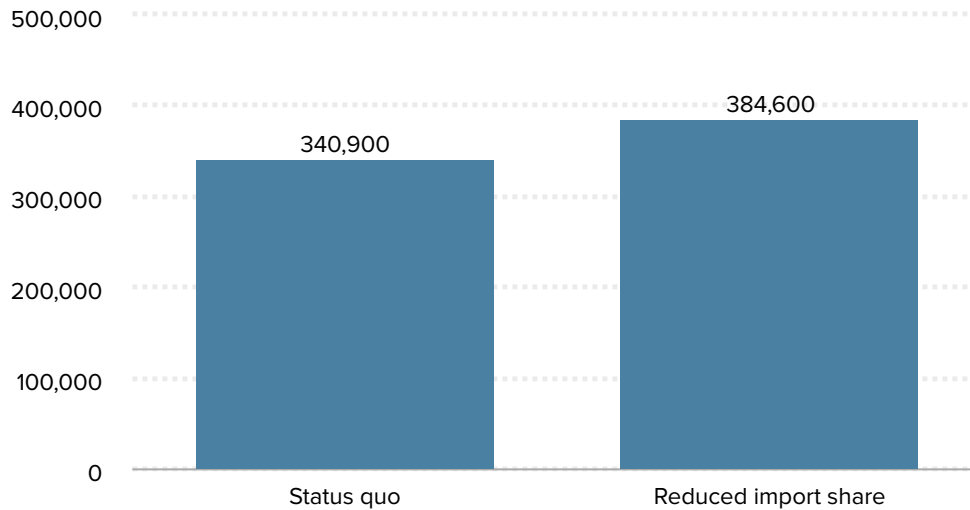
The manufacturing trade deficit is roughly 14 percent of domestic manufacturing consumption when this consumption is measured in gross output terms. If consumption is measured in value-added terms, then the manufacturing trade deficit is closer to 38 percent. Because it is not entirely clear which is the more relevant measure for assessing the trade deficit's impact on American manufacturing, we simply take the average of these measures—26 percent.⁶ This is a very large effect—domestic manufacturing production would be a quarter larger in the United States if manufacturing trade were balanced.

The trade deficit and the enormous share of domestically consumed manufactured goods that are imported are not the inevitable result of a globalized economy. Instead, they are largely the outcomes of a host of long-term policies that have hamstrung domestic manufacturing production. Policies have encouraged businesses to chase low-wage workforces to foreign nations comparatively unencumbered by regulatory protections for workers' rights or the environment, while policymakers have failed to enforce our trade

Figure B

Reducing import leakages would create more jobs from investing in infrastructure

Manufacturing job gains from a \$500 billion infrastructure investment with current levels of imports (status quo) and a one-third reduction in import share of manufacturing



Source: Author's analysis using data from the Bureau of Labor Statistics (2017)

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and procurement laws and have been reluctant to acknowledge and address currency misalignments—even those caused by other nations' intentional deployment of mercantilist exchange rate management.⁷ These past policy failures have not just led to rampant job loss in the manufacturing sector in recent decades; they have also weakened the power of infrastructure investment to create jobs. In short, because of our trade deficit, future policy efforts—such as U.S. taxpayer-funded infrastructure investments—that would otherwise be a boon to American manufacturing may instead lead to the leakage of manufacturing jobs abroad.

Two potential infrastructure scenarios

As we note above, if an ambitious infrastructure investment plan is approved by policymakers, the United States could be spending upward of \$500 billion per year on these investments. One natural question that might arise is, “How much would this infrastructure investment buoy demand for jobs in American manufacturing?” **Figure B** provides estimates for two scenarios.

Scenario One is the status quo, reflecting our estimate of manufacturing jobs that would be supported through \$500 billion in infrastructure spending given today's import shares in manufacturing industries. This estimate is obtained directly from the domestic employment requirements matrix (DERM) maintained by the Bureau of Labor Statistics (BLS

2017). The DERM allows one to feed in a vector of spending in infrastructure construction activity and derive the jobs that would be supported in supplier industries, including manufacturing.

Scenario Two is an estimate of manufacturing jobs that would be supported through \$500 billion in infrastructure spending if import shares of manufacturing consumption were cut by a third. We choose this share because it is roughly consistent with a 70 percent reduction in the manufacturing trade deficit, with imports and exports contributing proportionally to this closure.⁸ Given that manufacturing trade deficits will have to substantially shrink in coming decades if overall U.S. trade is going to move closer to a balance, it makes sense to assess what a significant reduction in the overall manufacturing trade deficit implies for import shares of manufacturing consumption.⁹

Under Scenario One, a \$500 billion infrastructure investment yields 340,900 jobs in the manufacturing sector. Under Scenario Two, with import shares cut by a third, a \$500 billion infrastructure investment yields 384,600 jobs in manufacturing, or almost 45,000 more jobs than would be supported by infrastructure investments alone.

Appendix Table 1 provides the breakdown of manufacturing industry employment gains stemming from these two scenarios. In either scenario, the 10 largest-gaining industries are architectural and structural metals manufacturing; cement and concrete product manufacturing; other wood product manufacturing; plastics product manufacturing; machine shops manufacturing; veneer, plywood, and engineered wood product manufacturing; other fabricated metal product manufacturing; sawmills and wood preservation; lime, gypsum, and other nonmetallic mineral product manufacturing; and ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing.

Discussion of results

There are, of course, a number of tools available for reducing the leakages from excessive net imports (trade deficits) in manufacturing. The most effective ones are systemic; particularly effective are those that target misaligned exchange rates or other persistent unfair trade practices that are the root cause of overall trade deficits.¹⁰

In the specific case of jobs supported in American manufacturing by infrastructure investments, more targeted policies mandating domestic content for government procurement and contracting would also boost domestic manufacturing jobs. Such “Buy America” policies ensure that taxpayer-financed projects use goods produced by American companies and workers, providing an economic boon to our manufacturing sector with no additional spending. While existing domestic-content preference policies are of immeasurable importance, it is important to note that they are limited in their scope—in terms of both the types of infrastructure projects and the types of materials that are covered. Meanwhile, many policymakers have proposed changes that would strengthen enforcement and close loopholes to prevent leakage.

The goal of this policy memo is simply to provide an illustrative estimation of the scale of

job gains that could possibly be claimed by ensuring that large-scale infrastructure investments are supported by a (reasonably) higher share of domestic content in manufacturing supplier industries. These job gains are far from trivial and would be a major benefit of policies that reduce the gap between imports and exports in America's manufacturing sector.

Acknowledgments

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Manufacturing jobs supported by a \$500 billion infrastructure investment, under status quo and reduced import share, by industry

Industry	Status quo	Reduced import share
<i>Architectural and structural metals manufacturing</i>	54,723	61,742
<i>Cement and concrete product manufacturing</i>	43,281	48,832
<i>Other wood product manufacturing, including wood TV, radio, and sewing machine cabinet manufacturing</i>	24,169	27,269
<i>Plastics product manufacturing</i>	21,007	23,701
<i>Machine shops; turned product; and screw, nut, and bolt manufacturing</i>	14,197	16,018
<i>Veneer, plywood, and engineered wood product manufacturing</i>	11,409	12,872
<i>Other fabricated metal product manufacturing</i>	11,405	12,868
<i>Sawmills and wood preservation</i>	10,736	12,113
<i>Lime, gypsum, and other nonmetallic mineral product manufacturing</i>	10,114	11,411
<i>Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing</i>	9,854	11,118
<i>Household and institutional furniture and kitchen cabinet manufacturing, excluding wood TV, radio, and sewing machine cabinet manufacturing</i>	8,697	9,813
<i>Other electrical equipment and component manufacturing</i>	7,335	8,275
<i>Motor vehicle parts manufacturing</i>	6,931	7,820
<i>Coating, engraving, heat treating, and allied activities</i>	6,279	7,084
<i>Electric lighting equipment manufacturing</i>	5,056	5,705
<i>Other general purpose machinery manufacturing</i>	4,968	5,605
<i>Converted paper product manufacturing</i>	4,902	5,530
<i>Printing and related support activities</i>	4,794	5,408
<i>Office furniture (including fixtures) manufacturing</i>	4,605	5,195
<i>Clay product and refractory manufacturing</i>	4,010	4,524
<i>Electrical equipment manufacturing</i>	3,793	4,279
<i>Petroleum and coal products manufacturing</i>	3,551	4,006
<i>Boiler, tank, and shipping container manufacturing</i>	3,550	4,005
<i>Iron and steel mills and ferroalloy manufacturing</i>	3,495	3,943
<i>Navigational, measuring, electromedical, and control instruments manufacturing</i>	3,316	3,741
<i>Semiconductor and other electronic component manufacturing</i>	3,306	3,730
<i>Agriculture, construction, and mining machinery manufacturing</i>	3,280	3,701

Appendix
Table 1
(cont.)

Industry	Status quo	Reduced import share
<i>Paint, coating, and adhesive manufacturing</i>	3,109	3,507
<i>Foundries</i>	2,770	3,125
<i>Other miscellaneous manufacturing</i>	2,749	3,101
<i>Steel product manufacturing from purchased steel</i>	2,639	2,977
<i>Forging and stamping</i>	2,402	2,710
<i>Textile mills and textile product mills</i>	2,387	2,693
<i>Basic chemical manufacturing</i>	2,316	2,613
<i>Spring and wire product manufacturing</i>	2,062	2,326
<i>Glass and glass product manufacturing</i>	1,954	2,205
<i>Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing</i>	1,913	2,158
<i>Rubber product manufacturing</i>	1,880	2,121
<i>Alumina and aluminum production and processing</i>	1,729	1,950
<i>Other chemical product and preparation manufacturing</i>	1,706	1,924
<i>Nonferrous metal (except aluminum) production and processing</i>	1,703	1,921
<i>Metalworking machinery manufacturing</i>	1,603	1,808
<i>Pulp, paper, and paperboard mills</i>	1,463	1,651
<i>Pesticide, fertilizer, and other agricultural chemical manufacturing</i>	1,337	1,508
<i>Household appliance manufacturing</i>	1,247	1,406
<i>Commercial and service industry machinery manufacturing, including digital camera manufacturing</i>	1,212	1,367
<i>Ship and boat building</i>	1,181	1,332
<i>Hardware manufacturing</i>	1,040	1,173
<i>Medical equipment and supplies manufacturing</i>	747	843
<i>Communications equipment manufacturing</i>	720	812
<i>Cutlery and hand tool manufacturing</i>	699	788
<i>Engine, turbine, and power transmission equipment manufacturing</i>	622	701
<i>Industrial machinery manufacturing</i>	619	698
<i>Aerospace product and parts manufacturing</i>	587	662
<i>Animal slaughtering and processing</i>	505	569
<i>Computer and peripheral equipment manufacturing, excluding digital camera manufacturing</i>	347	392
<i>Other food manufacturing</i>	319	359
<i>Railroad rolling stock manufacturing</i>	291	328

Appendix
Table 1
(cont.)

Industry	Status quo	Reduced import share
<i>Apparel, leather, and allied product manufacturing</i>	259	292
<i>Soap, cleaning compound, and toilet preparation manufacturing</i>	251	283
<i>Beverage manufacturing</i>	248	280
<i>Grain and oilseed milling</i>	237	267
<i>Pharmaceutical and medicine manufacturing</i>	198	223
<i>Dairy product manufacturing</i>	191	215
<i>Fruit and vegetable preserving and specialty-food manufacturing</i>	149	168
<i>Other furniture-related product manufacturing</i>	138	155
<i>Bakeries and tortilla manufacturing</i>	137	155
<i>Manufacturing and reproducing magnetic and optical media</i>	116	131
<i>Motor vehicle body and trailer manufacturing</i>	110	124
<i>Animal food manufacturing</i>	76	86
<i>Sugar and confectionery product manufacturing</i>	73	82
<i>Seafood product preparation and packaging</i>	63	71
<i>Other transportation equipment manufacturing</i>	24	27
<i>Motor vehicle manufacturing</i>	17	19
<i>Audio and video equipment manufacturing</i>	14	15
<i>Tobacco manufacturing</i>	1	1
Total	340,900	384,629

Note: Column two represents jobs created if import shares in manufacturing were reduced by a third.

Source: Author's analysis using data from the Bureau of Labor Statistics (BLS 2017)

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Endnotes

1. See AAM 2019 for polling results on infrastructure spending.
2. See Bivens 2019 for a description and quantification of these linkages.
3. This estimate comes from the Congressional Budget Office (CBO 2018a, 2018b). The CBO reports indicate that the federal government spends roughly \$100 billion directly on infrastructure, and that the federal government supports roughly 60 percent of the \$340 billion spent by states indirectly through loan guarantees or tax exemptions. The federal government also provides roughly \$50 billion per year in grants to state and local governments for transportation projects. Adding these fiscal resources together, the federal government supports roughly \$350 billion in infrastructure investment.
4. See the report card from the American Society of Civil Engineers (ASCE 2017) for the most-cited estimate of the insufficiency of current infrastructure investments.

5. More precise measures of manufacturing trade flows are available, but not on as timely a basis or with as long a historical time series as this proxy measure.
6. Gross output is essentially a measure of sales or revenue of an industry (with intrasectoral purchases removed). Value added is a measure of final output of an industry, with the contribution of all intermediate inputs removed. It is not entirely clear which measure is the more appropriate denominator for scaling the manufacturing trade deficit. For overall trade balances, it is clearly correct to use the value-added measure of output as the denominator in such a calculation, as the total trade deficit is the same whether measured in gross output or value-added terms. But for trade balances of specific sectors in the economy (even large sectors like manufacturing), this strict correspondence between gross output and value-added concepts of trade flows does not necessarily hold. Given this uncertainty, we simply report both measures.
7. See Scott 2017 on how policy decisions regarding exchange rates have been the dominant factor explaining rising trade deficits.
8. We choose a 70 percent reduction in the manufacturing trade deficit because this decline, coupled with unchanged service surpluses, would roughly balance overall trade.
9. As noted earlier, the manufacturing trade deficit is roughly equal to 26 percent of domestic manufacturing consumption. A 70 percent reduction in the U.S. manufacturing trade deficit (given current levels of consumption) would hence require an 18.2 percent increase in domestic production. If we assume 60 percent of this increase comes from reduced import shares (with the remainder coming from expanded exports), this implies a 10.8 percent increase in total domestic manufacturing output for any increase in domestic demand. If employment responded proportionately, this would imply a 10.8 percent increase in the level of manufacturing employment for any given increase in domestic demand. If we apply this job boost to the Scenario One measure of jobs to get the number of jobs supported by a 70 percent decrease in manufacturing trade deficits, this implies over 377,000 jobs supported by a \$500 billion infrastructure investment, a number quite close to our measure that simply reduces import shares in domestic manufacturing production by a third.
10. See Scott 2017 for a discussion of the causes of manufacturing trade deficits.

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