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## **USING STANDARD MODELS TO BENCHMARK THE COSTS OF GLOBALIZATION FOR AMERICAN WORKERS WITHOUT A COLLEGE DEGREE**

BY JOSH BIVENS

**T**rade's impact on American workers was a topic of heated debate during the recent presidential election. Most of the discussion focused on the implications of the overvalued dollar, which makes imports cheaper and exports more expensive—thereby contributing to the large trade deficits the U.S. economy has consistently generated in the last 15 years. Over the last decade, this overvalued dollar has been driven primarily by countries—particularly China—that, as a matter of intentional policy, manage the value of their currency for competitive gain.

This is indeed an important issue and has serious implications for *macroeconomic* outcomes such as growth in gross domestic product (GDP) and employment. However, besides this currently more pressing macroeconomic challenge to the U.S. economy posed by globalization, there is also a longer-run *microeconomic* challenge to wage growth of most American workers posed by the integration of a rich U.S. and much poorer global economy. This paper examines the microeconomic effects of growing trade flows with less developed countries and presents evidence that this sort of trade—dominated by China over the last decade—has been a significant drag on the wage growth of most American workers.

This paper begins by explaining how trade between the United States and poorer economies tends to reduce the wages of most American workers. It then documents the expansion of this trade in recent decades and uses a model developed by Krugman (1995) and updated by Bivens (2008) and Mishel et al. (2012) to determine how this trade has expanded wage inequality. Next, the paper estimates how these growing wage gaps have affected the earnings of non-college-educated U.S. workers. Finally, because trade's impacts on wages are often minimized in policy debates, it compares the wage losses stemming from trade with other economic benchmarks that are characterized as significant in Beltway policy debates.

The main findings of this paper are:

- A standard model estimating the impact of trade on American wages indicates that growing trade with less-developed countries lowered wages in 2011 by 5.5 percent—or by roughly \$1,800—for a full-time, full-year worker earning the average wage for workers without a four-year college degree. One-third of this total effect is due to growing trade with just China.
- Trade with low-wage countries can explain roughly a third of the overall rise since 1979 in the wage premium earned by workers with at least a four-year college degree relative to those without one. However, trade with low-wage countries explains more than 90 percent of the rise in this premium since 1995.
- For full-time wage earners without a college degree, annual earnings losses due to trade with low-wage nations are larger than income losses under a hypothetical policy that permanently extends the Bush-era tax cuts by making across-the-board cuts to government transfer payments such as Social Security, Medicare, Medicaid, and unemployment insurance.

## How trade can lower wages

The integration of the rich U.S. economy and poorer global economies drives specialization that leads the U.S. economy to increase production in capital-intensive (both physical and human) industries and decrease production in labor-intensive industries. This increased specialization is the basis for overall national gains from trade, and is why trade is often described as “win-win.” But while traditional trade theory does indeed predict that overall national income rises due to specialization, it also predicts that even more income is redistributed *within* nations. For a country like the United States, the implication is that *most* workers are likely net losers from growing trade with poorer countries.

The logic behind this trade-induced redistribution is simply that as the United States increases production (and increases exports) of capital-intensive goods and reduces production (and increases imports) of labor-intensive

goods, this leads directly to a reduced demand for labor and increased demand for capital services. This in turn reduces wages while raising the returns to capital (both physical and human). (For a detailed overview of the effects of trade on U.S. labor markets, see Bivens 2007 and Bivens 2008.)

Importantly, the wage effects of global integration reach beyond those workers exposed directly to foreign competition. As imports displace non-college-educated workers from tradeable sectors (such as manufacturing), these laid-off workers need to accept lower wages to obtain work in other sectors (such as landscaping or construction). Further, the competition provided by these workers helps to lower the wages of similar workers *already employed* in these sectors. In short, while it is impossible to replace a waitress (a job in the non-tradable restaurant sector) with imports, her wages are harmed by having to compete with apparel workers who have lost jobs due to increased trade flows.

It is also important to note that wages for most American workers may suffer even absent this reorganization of production, as the mere threat of direct foreign competition or of the relocation of part or all of a production facility can lead workers to grant wage concessions to their employers. This is often referred to as the “threat effect” of globalization. There is ample evidence that variation in wages is in large measure due to differing degrees of bargaining power in imperfectly competitive labor markets. Given this, and given the deep damage to bargaining power inflicted by global integration that has greatly strengthened employers’ hand in wage bargaining with employees, it seems clear that this “threat effect” could be considerable indeed (see, for example, Rodrik 1998 on the impact of globalization on wage bargaining).

In summary, there are many ways that trade lowers wages. The following sections examine how international trade has affected the U.S. wage structure—in particular, the impact on wages of recent decades’ trends in trade with less-developed nations. It should be noted that these

estimates do not capture the hard-to-measure “threat effects” just mentioned, so they almost surely understate the true impact of trade on American wages.

## Growing U.S. trade with poorer partners

Globalization has led to increased trade flows between the United States and other countries. Since the early to mid-1970s, a growing share of this trade has occurred with low-wage nations.

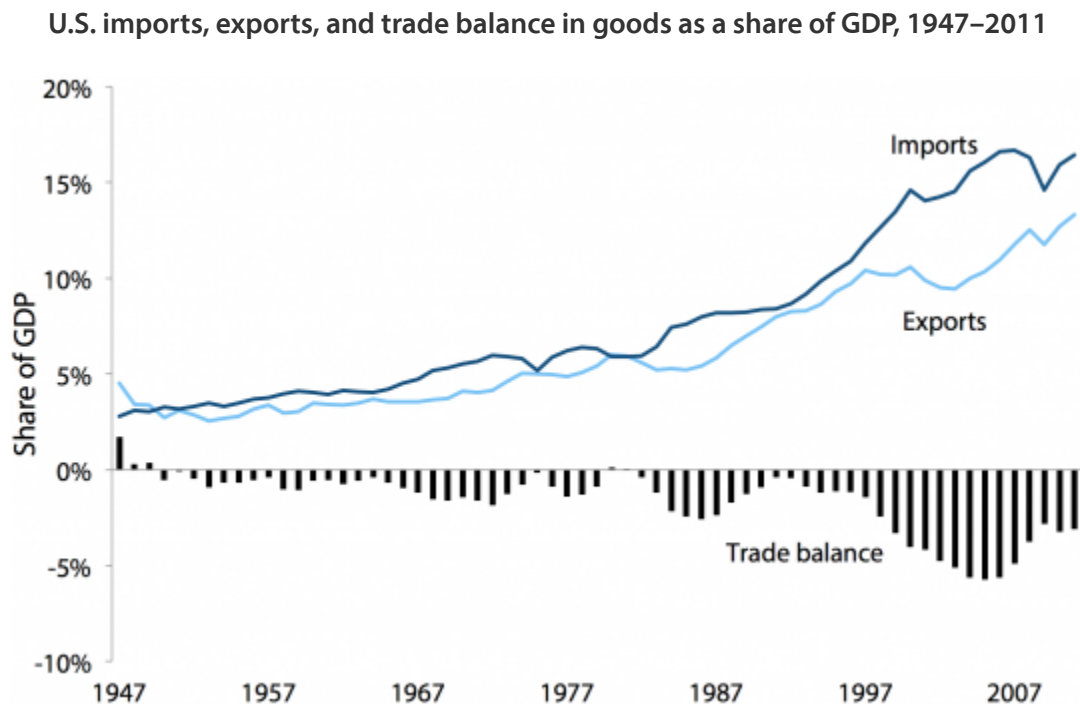
**Figure A** presents the trends in the imports and exports of goods as well as the size of the U.S. trade deficit in goods relative to GDP over the postwar period. Trade was balanced for the most part from 1947 through the 1970s. A large deficit emerged in the mid-1980s as exports fell and imports continued to grow. Exports recovered after the fall-off in the dollar’s value in the late 1980s and helped to close the deficit by the early 1990s.

The goods trade deficit spiked in the mid-1980s, rising to 2.6 percent of GDP (up 2.7 percentage points of GDP from 1980 to 1986). This escalation of the trade deficit and the rapid growth of imports were associated with a major restructuring of wages (and a fall in real wages for many workers) that occurred in the early 1980s, as documented in Mishel et al. (2012). The trade deficit fell below 1.0 percent of GDP in the early 1990s before rising rapidly in the late 1990s to 4.0 percent of GDP in 2000.

The deficit grew to 5.6 percent of GDP in 2004–2006. To the extent that the trade deficit is a proxy for trade’s impact on wages of middle- and low-wage workers, the timing of growing trade deficits coincided with rising wage inequality during two recoveries, one in the late 1990s and the other in the early and mid-2000s, as explained in Mishel et al. (2012).

An important characteristic of globalization has been the rising importance of trade with lower-wage, developing countries, especially since the end of the 1980s. This

FIGURE A



**Source:** Author's analysis of Bureau of Economic Analysis National Income and Product Accounts. Reproduced from Mishel et al. (2012), Figure 4Y.

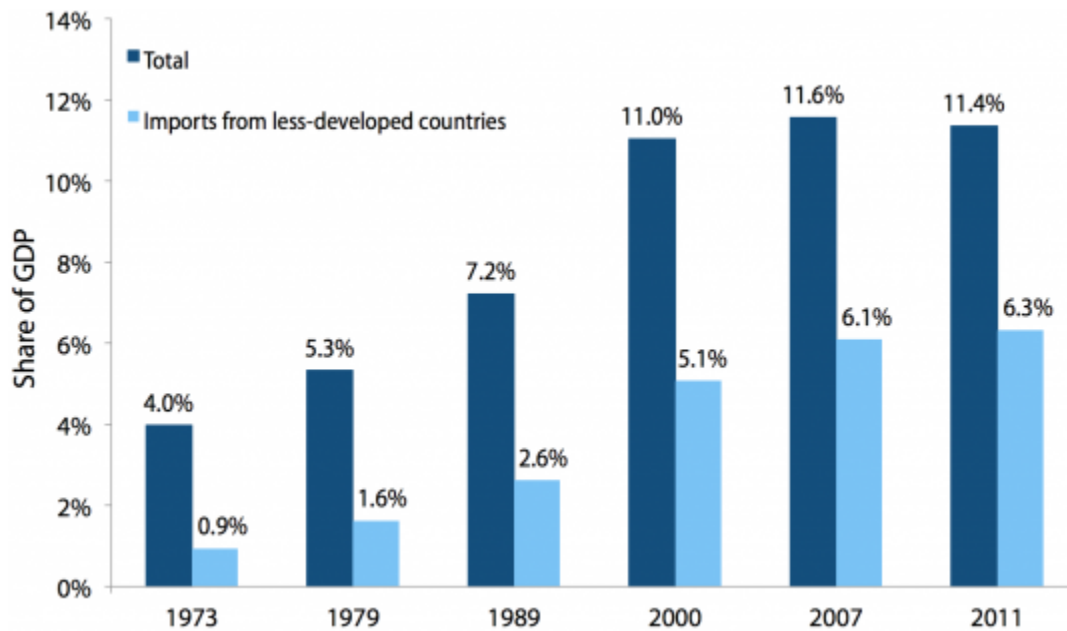
development is illustrated in **Figure B** by the growth in the share of U.S. manufacturing imports originating in developing countries (measured as a share of GDP). In 1973, imports from low-wage countries represented only 0.9 percent of GDP and, despite a rapid rise in imports in the 1980s, they reached only 2.6 percent of GDP in 1989. By 2000, however, imports from low-wage countries had doubled in importance, registering 5.1 percent of GDP, and they grew even further to 6.1 percent of GDP by 2007, to the point that they made up more than half of all manufacturing imports. By 2011 imports from low-wage countries had grown further to 6.3 percent of GDP even though manufacturing imports as a whole had declined. Industries subject to foreign competition have faced growing competition over the last 30 years, and this competition increasingly comes from lower-wage countries. In fact, the rise in imports between 1979 and 2011 was primarily due to greater imports from low-wage nations: About three-fourths (4.7 percentage points) of the 6.0 percentage-point rise in U.S. manufacturing

imports as a share of GDP was due to imports from low-wage countries.

We further explore the changes in the composition of trade by examining the relative (to the United States) productivity levels of nations to which the United States exported and from which it received imports since the early 1970s. A nation's productivity level is an indicator of its wage level and its level of development; thus, a lower relative productivity level of U.S. import partners indicates increased competition from developing, lower-wage countries. As **Figure C** shows, U.S. export and import trading partners had equivalent productivity levels in 1973, at roughly 57 percent of U.S. productivity, and this parity prevailed through 1989. However, by 2000 the productivity levels of U.S. import trading partners had fallen. Between 2000 and 2011 our exports became increasingly focused on higher-productivity nations, and the productivity levels of the countries where our imports originate fell further. These trends imply that our trade

FIGURE B

U.S. manufacturing imports as a share of GDP, 1973–2011



Source: Author’s analysis of United States International Trade Commission Tariff and Trade DataWeb and Bureau of Economic Analysis National Income and Product Accounts. Reproduced from Mishel et al. (2012), Figure 4Z.

imbalances with lower-wage nations grew in scale in the 2000s.

### Evidence from standard models on the impact of trade with low-wage countries on U.S. wages

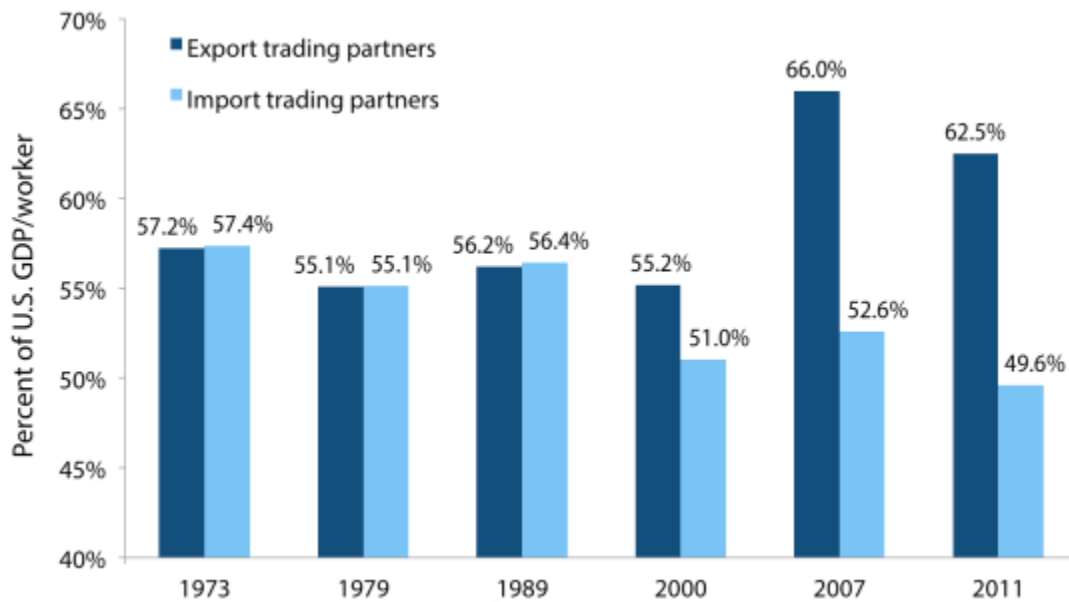
The data presented so far clearly show that trade, particularly with low-wage developing countries, accelerated rapidly in recent decades. This section briefly examines how international trade trends have widened the wage gap between those with a college degree and those without.

To gauge the impact of globalization on wages and wage inequality, particularly the rising competition from lower-wage nations, we examine the results of a “computable general equilibrium” (CGE) model developed by economist Paul Krugman in the mid-1990s. What drives this model’s estimates of the impact of trade on wage inequality is the share of trade coming from low-wage developing countries. The model answers two questions: How

much would global prices (both of products and labor) have to change in order make goods from less-developed countries unprofitable to send to the U.S. market, and how much would U.S. wages change in response? In other words, what would U.S. wages (and domestic product prices) be but for the opportunity to trade with less-developed countries? The larger the real-world share of trade with less-developed countries in any given year, the larger the hypothetical change in prices and wages needed to zero it out, and the larger trade’s impact on American wages. All imports in this analysis are manufacturing imports originating from less-developed countries and not services, oil, or other natural resource imports. The model assesses the impact of this trade on the hourly wage differential between those with a college degree or more (college or advanced degrees) and other workers (with this latter category combining those with “some college,” high school, or “less than high school” educations); this differential is referred to as the college/noncollege wage gap.

FIGURE C

Relative productivity of U.S. trading partners, 1973–2011



**Note:** Bars show trading partners' productivity as a share of U.S. productivity.

**Source:** Author's analysis of United States International Trade Commission Tariff and Trade DataWeb and the Penn World Table (Heston, Summers, and Aten 2011). Reproduced from Mishel et al. (2012), Figure 4AA.

In 1979, when such trade with less-developed countries made up just 1.8 percent of GDP, the model shows a modest 2.7 percent widening of the college/noncollege wage gap as a result of this trade (Table 1). In 1995, when trade with low-wage nations had risen to 3.6 percent of GDP, the relative impact on the wage gap was correspondingly higher, at 5.6 percent. Between 1979 and 1995, developing-country trade's growing impact on the wage gap (a 2.9 percentage-point increase) was equivalent to 16.7 percent of the 17.2 percentage-point rise of the college/noncollege wage gap in this period.

By 2011, the trade share from low-wage countries had risen to 6.4 percent of GDP, substantially greater than in 1995 and 1979. The wage impact of this increased trade from low-wage countries was 10.0 percent in 2011, 4.4 percentage points higher than in 1995. Because the college/noncollege wage gap rose only modestly in this period, from 46.1 percent in 1995 to 50.9 percent in 2011, the increased impact of trade on relative wages

(4.4 percentage points) accounted for 93.4 percent of the growth of the college/noncollege wage gap since the mid-1990s. Thus, increased competition from low-wage countries has been a strong factor pushing toward greater wage inequality since 1995, and without it the growth in the gap would have been trivial, from 46.1 to 46.5 percent. Over the entire 1979–2011 period, trade from low-wage nations caused a 7.3 percentage-point rise in the college/noncollege wage gap, accounting for a third of the entire growth in this education wage differential.

Much of the growth in U.S. trade with less-developed countries has originated from China, and Table 1 provides an estimate of the impact of the growth of U.S.-China trade on the college/noncollege wage gap. These estimates simply apportion to China an impact based on its share of less-developed country imports. China trade grew by 1.6 percentage points of GDP from 1995 to 2011, accounting for more than half of the total growth (2.8 percentage points of GDP) of less-developed-country imports. Con-

TABLE 1

## Impact of trade with low-wage countries on college/noncollege wage gap in the United States, 1973–2011

	1973	1979	1989	1995	2000	2007	2011	CHANGE		
								1979–1995	1995–2011	1979–2011
<b>Manufacturing trade penetration (as share of GDP)*</b>										
<i>Less-developed country (LDC) trade</i>	1.0%	1.8%	2.5%	3.6%	4.6%	5.6%	6.4%	1.8	2.8	4.7
<i>China trade***</i>	0.0	0.0	0.2	0.5	0.8	1.8	2.0	0.5	1.6	2.0
<b>College/noncollege wage gap**</b>										
	36.9%	28.9%	41.5%	46.1%	48.2%	49.2%	50.9%	17.2	4.8	22.0
<b>Estimated impact of trade on college/noncollege wage gap</b>										
<i>All LDC trade</i>	1.6%	2.7%	4.0%	5.6%	7.3%	8.8%	10.0%	2.9	4.4	7.3
<i>China trade***</i>	0.0	0.0	0.3	0.7	1.2	2.8	3.2	0.7	2.5	3.2
<b>Trade share of college/noncollege wage gap</b>								<b>PERCENT OF CHANGE</b>		
<i>All LDC trade</i>	4.3%	9.5%	9.5%	12.1%	15.0%	17.9%	19.7%	16.7%	93.4%	33.2%
<i>China trade***</i>	0.0	0.1	0.6	1.6	2.5	5.7	6.3	4.1	51.6	14.4

\* "Penetration" is the average of the import share and the trade share to reflect current imbalance but also impact of balanced trade.

\*\* Differential between those with a college or advanced degree and all other workers

\*\*\* Based on China share of LDC trade share, which assumes China trade impact equals other LDC trade impact

**Source:** Author's update of Bivens (2008) reanalysis of Krugman (1995) computable general equilibrium model using 2011 USITC and Bureau of Economic Analysis NIPA data. Reproduced from Mishel et al. (2012), Table 4.29.

sequently, the trade with China served to expand the college/noncollege wage gap by 2.5 percentage points, or 51.6 percent of the total 4.8 percentage-point growth in the college/noncollege wage gap from 1995 to 2011.

## Putting the findings in context

This section contextualizes the findings previously discussed by estimating the degree to which the growth of trade with lower-wage nations has decreased the wages of an archetypal U.S. worker and household. In addition, because trade's impacts on wages are often minimized in policy debates, this section compares the wage losses

stemming from trade with those that would result from other economic benchmarks presented as significant in economic policy debates.

**Table 2** shows the implied loss to American workers from growing trade with less-developed nations (methodological details are provided in the appendix). The first column of data translates the aforementioned wage-depressing effects of this trade into dollars lost by a full-time, full-year worker earning the average wage for workers without a four-year college degree ("noncollege workers," henceforth) in 2011. The next column presents the wage losses for a household composed of two workers



TABLE 2

### Benchmarking globalization's impact on non-college-educated U.S. workers and households

Policy	COST OF POLICY, 2011	
	Archetypal worker*	Archetypal household**
<i>Growing trade with less-developed countries</i>	\$1,761	\$3,084
<i>Growing trade with China</i>	564	987
<i>Making Bush-era tax cuts permanent and financing with across-the-board cuts to transfers***</i>	963	1,685
<i>Solving 75-year Social Security funding gap with across-the-board payroll tax increase</i>	862	1,510
<i>Annual federal income taxes</i>	775	1,357

\* Annual income loss for a full-time worker earning average hourly wage for non-college-educated workers in 2011

\*\* Annual income loss for a household of two workers supplying 3,500 hours of work per year while earning average hourly wage for non-college-educated workers in 2011

\*\*\* "Transfers" refers to programs such as Social Security, Medicare, Medicaid, unemployment insurance, and food stamps.

**Source:** Author's analysis of Krugman (1995), Bivens (2008), Mishel et al. (2012), Furman (2007), Social Security Administration (2012), and CBO (2012). See the appendix for methodology.

earning this average hourly wage who supply a total of 3,500 hours of paid work per year (roughly the average for middle-income households in 2011).

Table 2 shows that growing trade with poorer countries cost this archetypal worker roughly \$1,800 in 2011, an earnings loss of 5.5 percent. Growing trade with China alone implies a loss of more than \$550 by that same year. For the archetypal household, the comparable losses are just under \$3,100 and \$1,000, respectively.

Table 2 also contextualizes these findings by comparing them with the earnings losses that would result from hypothetical policy changes that loom large in current policy debates. In particular, we compare them with the effects of financing a permanent extension of the Bush-era tax cuts with an across-the-board cut in federal transfers such as Social Security, Medicare, Medicaid, unemployment insurance, and the Supplemental Nutrition Assistance Program (i.e., food stamps).

Furman (2007) presents research showing that such a policy change would provide a very slight GDP boost in the long run (as lower marginal tax rates increase labor supply and savings), but would impose absolute losses on lower- and middle-income households. This is because they receive only relatively small tax cuts and rely much more heavily than affluent households on these transfer programs.

As the table shows, increased trade with less-developed countries has resulted in much larger losses than would occur under this rather drastic policy shift. This highlights the degree to which growing trade has harmed the living standards of noncollege workers.

The table also includes the cost to the archetypal worker and household of closing the 75-year actuarial shortfall in Social Security with an immediate across-the-board increase in the payroll tax rate. It should be noted that this policy shift is neither necessary nor particularly desirable: There is no pressing urgency to close this forecasted actu-



arial shortfall, and should closing it become necessary in the future, more progressive measures—such as lifting the income threshold that defines the tax base for the Social Security payroll tax—could be adopted instead. However, this 75-year accounting shortfall is often presented in D.C. policy discussions as a potentially crushing burden on America’s workers. It is thus instructive to determine how the costs to workers that could be incurred from closing the shortfall compare with earnings losses resulting from growing trade. As it turns out, the standard model shows that growing trade with poorer countries has cost the archetypal worker and household more than twice as much as would raising payroll taxes to close the projected Social Security shortfall. To put it mildly, this is not a widely recognized insight in D.C. policymaking.

Lastly, Table 2 shows the amount of federal income taxes paid by the archetypal worker and household in 2011 (the estimate applies the average federal income tax rate from 2002 to 2009 of households in the middle income fifth). Again, the costs imposed on noncollege workers by growing trade is significantly larger than the average amount of annual federal income taxes paid by this group—another insight that is seldom recognized in most policymaking circles. This further highlights the extent to which trade with less-developed countries has harmed the living standards of noncollege workers.

## Conclusion

Much recent debate over the challenges globalization poses to American workers has understandably focused on the macroeconomic dangers that an overvalued U.S. dollar and chronic U.S. trade deficit present. The downward pressure on wages imposed by trade flows is exacerbated by the overvalued U.S. dollar; the overvalued dollar makes imports cheaper and exports more expensive, which in turn increases the U.S. trade deficit. However, even if the dollar eventually reaches a sustainable level and trade deficits close, globalization will continue to impose a drag on the wages of most American workers.

This paper presents evidence from a standard trade model on the size of these effects. Bivens (2008) notes further that the impact of global trade on American wages could well double, or even triple; according to some well-pedigreed forecasts, trade in previously non-traded sectors (such as professional services) will expand due to falling communications and information technology costs.

It is important to note that various policy decisions that have governed how the American economy is integrated into the global economy have increased the damage done to American workers. These acts of omission as well as commission include pursuing expanded global integration through trade agreements that carve out protections for corporate investors but not for American workers, and failing to block the overvaluation of the U.S. dollar. It is also important to note that overall national income is likely larger because of globalization and expanded opportunities to trade, and that there has been little to no effort to ensure that these overall national gains are broadly shared. Indeed, national income gains have instead become increasingly concentrated at the top of the income distribution in the same timespan examined in this paper.

It is time to reorient all levers of economic policy—both international and domestic—to ensure that the gains globalization produces actually filter through to help, not harm, most American workers.

—*Josh Bivens joined the Economic Policy Institute in 2002 and is currently the director of research and policy. His primary areas of research include macroeconomics, social insurance, and globalization. He has authored or co-authored three books (including The State of Working America, 12th Edition) while working at EPI, edited another book, and has written numerous research papers, including for academic journals. He appears often in media outlets to offer economic commentary and has testified several times before the U.S. Congress. He earned his Ph.D. from The New School for Social Research.*

— Sections of this paper were adapted from the author's contribution to *The State of Working America*, 12th Edition (Mishel et al. 2012).

## Appendix

The results from the Krugman (1995) CGE model are used to assess the wage impact of trade with less-developed countries. While often only the results for relative wages are highlighted by such models, they also yield absolute changes in wages for college and noncollege workers. For this update, we take the relative wage changes generated by the CGE model and then simply apportion this relative change into gains for college workers and losses to noncollege workers.

We achieve this by taking ratios of these relative and absolute wage changes from the results of Bivens (2008). This yields the result that trade with poorer nations has lowered noncollege wages by 5.5 percent and increased college wages by 4.5 percent. We then multiply the implied hourly wage changes for noncollege workers by the annual earnings of a full-time employee earning the average wage for noncollege workers in 2011 (\$16.14 per hour, according to Mishel et al. 2012), and then by the annual earnings of a household that supplies 3,500 hours of work per year at this same hourly wage. This yields the annual earnings losses for these two groups.

For the cost of financing a permanent extension of the Bush-era tax cuts with an across-the-board cut in transfer payments, we simply update the results of Furman (2007) by inflating his results by the CPI-U-RS between 2006 and 2011.

For the cost of closing the 75-year actuarial shortfall in Social Security, we multiply the annual earnings of our model worker and household by 2.67 percent—the amount that the Social Security Administration has indicated that combined payroll taxes would have to rise in order to close the 75-year funding gap (Social Security Administration 2012). It should be noted that only half

of this increase would be directly visible to workers, as employers pay half the overall payroll tax rate. However, because most economists assume that wages will fall (or grow more slowly) over time to finance any rise in employer payroll taxes, Table 2 assigns the full cost of closing the 75-year gap to workers.

Lastly, for calculating the cost of federal income taxes to our model worker and household, we multiply their annual earnings by the 2.4 percent average income tax rate of the middle fifth between 2002 and 2009, according to data from the Congressional Budget Office (CBO 2012).

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