ESTIMATING THE ECONOMIC AND BUDGETARY EFFECTS OF NEW H-1B VISAS IN THE SENATE GANG OF EIGHT'S PROPOSED IMMIGRATION BILL

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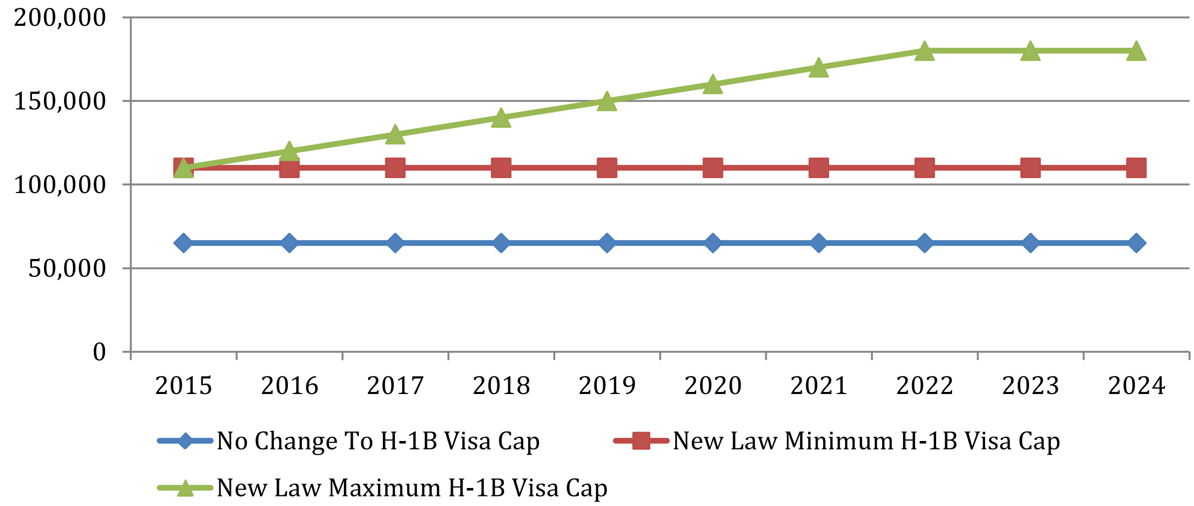
The Hoover Institution's **Conte Initiative on Comprehensive Immigration Reform** is the result of numerous workshops, meetings, and conversations during the past year among academics, politicians, and Hoover fellows concerned with the structure and outcomes of America's immigration system. Chaired by Hoover senior fellow Edward Lazear, the initiative continues to examine legal and illegal immigration. The guiding principle is to identify clear improvements to what most agree is an unfair and inefficient immigration system.

Initial estimates put the appropriations cost of the Senate Gang of Eight's immigration bill (S. 744) at about $17 billion over ten years, leading at least a few politicians to cite cost as a potential reason to oppose its passage.[1] But as Senator Rubio and others have pointed out, that cost does not include the economic benefits and tax revenue that would come from future immigrants. One group in particular, new H-1B visa workers, would add an estimated $456 billion to GDP and $113 billion to federal tax revenue over the next ten years. $244 billion of that increase in GDP would accrue to current US citizens and residents, with the rest going to the new H-1B workers.

Estimating the Number of New H-1B Workers

The Senate Gang of Eight's immigration plan increases the general cap on H-1B visas to a minimum of 110,000 and a maximum of 180,000, and increases the master's degree cap from 20,000 to 25,000. The cap is allowed to increase or decrease by a maximum of 10,000 each year, depending on the newly created High Skilled Jobs Demand Index.

Figure 1, General H-1B Visa Cap For New Visas Under Current Law and Proposed Senate Bill



There were 124,000 applications in the first five days of fiscal year 2014 applications for the general and advanced degree H-1B visas.[2] If the cap were to start at 110,000 in fiscal year 2015 and increase by 10,000 each year, it would reach the 180,000 limit in 2022. There seems to be considerable growth in demand for H-1B visas over time. In fiscal year 1992, 48,600 general H-1B visas were granted, but there were 163,300 visa granted in 2001 when the cap was temporarily lifted to 195,000.[3] It is reasonable to assume the new cap would increase each year

[1] Sara Murray, "Immigration Bill's Price Tag an Issue," *WSJ Online*, April 16, 2013, http://online.wsj.com/article/SB10001424127887324345804578427170797280396.html.

[2] USCIS, "H-1B Fiscal Year (FY) 2014 Cap Season," http://www.uscis.gov/portal/site/uscis/menuitem.5af9bb95919f35e66f614176543f6d1a/?vgnextoid=4b7cdd1d5fd37210VgnVCM100000082ca60aRCRD&vgnextchannel=73566811264a3210VgnVCM100000b92ca60aRCRD.

[3] National Foundation For American Policy, "H-1B Visas by the Numbers: 2010 and Beyond," *NFAP Policy Brief*, March 2010.

by the 10,000 slots allotted until it hit the 180,000 visa limit. The first year after implementation would see 50,000 more H-1Bs issued than before; 45,000 under the general cap and 5,000 under the master's degree exemption.

H-1B visas are granted for an initial term of three years with the opportunity for an additional three-year extension. While many complete those six-year terms and return home, others either return home early or obtain other forms of work authorization. H-1B visas are one of the few temporary work visas that allow the holder to pursue a green card while living and working in the United States. One-year extensions can be granted if the visa holder is petitioning for a green card. Absent questions of emigration the number of additional workers in each year would be the new workers above the old cap in a year plus the number of workers still in the workforce from prior years.

Unfortunately, there is not an official estimate of annual emigration of those holding H-1B visas. Lowell and Bump (2000) cite 3.2% as a typical estimate of annual emigration for immigrants, but they caution "emigration rates should be assumed to vary for different visas dominated by immigrants of known age and place-of-birth, e.g., lower rates of emigration apply to highly skilled green carders but higher rates to Mexican immigrants in temporary work programs."[4] To keep estimates conservative and to include the transition to other visas, the assumed emigration rate was nearly tripled to 10% a year; H-1B workers who did not emigrate were estimated to work for six years and then leave the country.

Table 1, The Effect of Emigration on H-1B Workers in the Workforce Under New Caps

Year	Without Emigration	With 10% Emigration
2015	50,000	50,000
2016	110,000	105,000
2017	180,000	164,500
2018	260,000	228,050
2019	350,000	295,245
2020	450,000	365,721
2021	510,000	412,576
2022	570,000	459,432
2023	620,000	496,288
2024	660,000	524,144

The number of additional H-1B workers in the workforce increases fairly rapidly, with growth slowing down by 2021 when the initial six-year term of fiscal year 2015 H-1B recipients ends. (Note: the numbers are the total number of H-1B workers in the workforce in that year who otherwise would not have been in the workforce if the Senate's bill were to pass.)

[4] B. Lindsay Lowell and Micah Bump, "Projecting Immigrant Visas: Report on an Expert's Meeting," *Institute for the Study of International Migration*, October 2006, 5-6.

Estimating The Effect on GDP of New H-1B Workers

H-1B visa holders are well-educated and earn high wages. In 2011, 58% held advanced degrees and the mean wage of H-1B visa workers was $78,000. Mean wages were $72,000 for newly arrived H-1B recipients and $82,000 for those renewing their visas for continuing employment.[5] Administrative data from the Department of Homeland Security shows median income for initial H-1B visa recipients rose from $48,000 in 2004 to $62,000 in 2011, an annualized increase of 3.72% (Mean wages were not available as far back as 2004). That time period includes an economic boom, bust, and recovery. In order to be conservative, wages of all H-1B recipients are assumed to grow at 3% a year. Nominal dollars are used for all figures to allow for comparisons to the Congressional Budget Office's (CBO) ten-year budget forecasts.

Since mean wages are more useful for economic impact and tax revenue estimates, this analysis uses the most recent data for mean wages of initial H-1B recipients in fiscal year 2011 as the base wage, adjusted by 3% wage growth a year. The adjusted mean initial wage in fiscal year 2015, using fiscal year 2011 as the base year, is $81,037. To be conservative, mean initial wage in the first year of this analysis is assumed to be $80,000.

Table 2, Estimated Mean Initial Wages

Fiscal Year	Wages (Nominal Dollars)
2015	$80,000
2016	$82,400
2017	$84,872
2018	$87,418
2019	$90,041
2020	$92,742
2021	$95,524
2022	$98,390
2023	$101,342
2024	$104,382

The estimated effect on GDP of new H-1B workers is the sum of labor and capital income that can be attributed to those workers. The labor share of income is calculated by multiplying the number of H-1B workers in each year by their estimated mean wage. They pay federal income and payroll taxes at the same rates that legal permanent residents and American citizens pay. H-1B workers capture their net income (gross earnings minus taxes), while the federal tax revenue would go to American citizens and current residents. Gross earnings by new H-1B workers would total $297 billion, of which $212 billion would be captured by H-1B workers in the form of post-tax earnings and $84 billion would be captured by American citizens and residents in the form of federal tax revenue.

Once total labor income has been estimated, the sum of capital income attributable to new H-1B workers can be found by estimating the total share of income that goes to labor, since the shares of labor and capital sum to one. Labor's share of income is close to historic lows of around 60%.[6] The CBO, noting the stable behavior of labor's share of income since World War II, assumes a reversion to the long-term average of close to 63%.[7] Higher estimates of labor

[5] Department of Homeland Security, "Characteristics of H-1B Specialty Occupation Workers," March 12, 2012, Tables 6, 10, 11, and 12.

[6] Margaret Jacobson and Filippo Occhino, "Labor's Declining Share of Income and Rising Inequality," *Federal Reserve Bank of Cleveland*, September 15, 2012, http://www.clevelandfed.org/research/commentary/2012/2012-13.cfm.

[7] Congressional Budget Office, "How CBO Forecasts Income," *Background Paper*, August 2006.

income are necessarily associated with lower estimates of total capital income. In order to be conservative, this analysis assumes labor's share of income will be 65%. At that rate, the additional capital income attributable to new H-1B workers is $160 billion over ten years. Since the size of new H-1B workers is dwarfed by the size of the American population, it is reasonable to assume that nearly all of the benefits of the additional $160 billion in capital income accrue to current residents and citizens.

Table 3, Increase in GDP Attributable to New H-1B Workers (Billions of Dollars)

Fiscal Year	Total Labor Income	Capital Income	GDP
2015	$4.00	$2.15	$6.15
2016	$8.65	$4.66	$13.31
2017	$13.96	$7.52	$21.48
2018	$19.94	$10.73	$30.67
2019	$26.58	$14.31	$40.90
2020	$33.92	$18.26	$52.18
2021	$39.41	$21.22	$60.63
2022	$45.20	$24.34	$69.54
2023	$50.29	$27.08	$77.38
2024	$54.71	$29.46	$84.17
Total	$296.67	$159.75	$456.42

Estimating Tax Revenue Paid by New H-1B Workers

As high-paid workers, H-1B recipients pay considerable amounts in federal income and payroll taxes. Effective federal tax rates in this analysis were estimated using the National Bureau of Economic Research's (NBER) TAXSIM (v9) calculator, based on the average initial wage of an H-1B recipient in 2011 of $72,000.[8] Payroll taxes were corrected to remove the payroll tax holiday in place in 2011, therefore making the assumption that more payroll tax holidays are unlikely to be implemented in the future. Both employee and employer contributions were included.

Assumptions are also necessary to determine the distribution of H-1B population who is single versus married, and how many dependents they have. Using NBER's TAXSIM calculator, single individuals with earnings of $72,000 faced an $11,750 income tax and $11,016 payroll tax bill in 2011 (absent the payroll tax holiday); married individuals with two kids had a lower income tax burden of $5,990. 83% of H-1Bs applying for initial employment in 2011 were younger than 35 and 57% were younger than 30.[9] The U.S. State Department reported the ratio of H-4 (spouse and dependents) to H-1B visas issued in 2012 at 59%, although H-4 visas are also issued to spouses and dependents of H-2A and H-2B visa holders – seasonal agricultural and non-

[8] Daniel Feenberg and Elizabeth Coutts, "An Introduction to the TAXSIM Model," *Journal of Policy Analysis and Management*, 12 (1993): 189-194. National Bureau of Economic Research TAXSIM (v9), http://users.nber.org/~taxsim/taxsim-calc9/index.html.

[9] Department of Homeland Security, "Characteristics of H-1B Specialty Occupation Workers," March 12, 2012, Table 5.

agricultural workers.[10] Reliable estimates of the distribution of dependents and marriage status of H-1B visas are difficult to come by; for simplicity's sake, this estimate conservatively assumes 60% are single and 40% are married with two kids.

Using the assumptions listed above, the average H-1B worker in 2011 had a federal tax burden of $20,462 on $72,000 of income, yielding an effective federal tax rate of 28.94%. Note that this number includes both income and payroll taxes. It also matches the magnitude of estimates made in Holen (2009).[11] Since federal tax rates change with regularity, it seems imprudent to make estimates about what future tax rates could be. Instead, the assumption is made that labor income in each of the years estimated is taxed at a 28.94% effective rate.

Table 4, Federal Tax Revenue Attributable to New H-1B Workers (Billions of Dollars)

Fiscal Year	Labor Tax Revenue	Capital Tax Revenue	Total
2015	$1.14	$0.39	$1.52
2016	$2.46	$0.84	$3.30
2017	$3.97	$1.35	$5.32
2018	$5.67	$1.93	$7.60
2019	$7.56	$2.58	$10.13
2020	$9.64	$3.29	$12.93
2021	$11.20	$3.82	$15.02
2022	$12.85	$4.38	$17.23
2023	$14.29	$4.87	$19.17
2024	$15.55	$5.30	$20.85
Total	$84.31	$28.75	$113.07

Estimates are also made about federal tax revenue collected on capital's share of income. Capital is typically taxed at lower rates than labor income. Recent estimates of effective tax rates on capital are difficult to come by; the tax code has changed substantially in the last few years, most notably from the American Taxpayer Relief Act of 2012 (ATRA) that extended portions of the 2001 EGTRRA and 2003 JGTRRA "Bush tax cuts," eliminated some, and partially resolved the "fiscal cliff." A 2005 estimate by the CBO put the effective tax rate of business capital at 24.2% assuming the 2001 and 2003 laws were extended permanently, and 31.9% if the laws were allowed to expire.[12] The overall effective tax rate on capital estimated is much smaller – 13.8% with the extension of tax cuts and 17.4% without – although that number is "strongly influenced" by a negative rate on implicit income from owner-occupied housing. Since the capital share of income estimated in this analysis is related to the additional marginal product businesses acquire by hiring high-skilled employers, the effective tax rate on business

[10] United States State Department, "FY2012 NIV (Nonimmigrant Visa) Workload by Category," http://www.travel.state.gov/pdf/FY2012NIVWorkloadbyVisaCategory.pdf.
[11] Arlene Holen, "The Budgetary Effects of High-Skilled Immigration Reform," *Technology Policy Institute*, March 2009.
[12] Congressional Budget Office, "Taxing Capital Income: Effective Rates and Approaches to Reform," October 2005.

capital is preferred. To be conservative, and until estimates of the effective rate of capital's share of income can be calculated following ATRA, this analysis assumes an effective tax rate on capital of 18%.

Estimating Tax Benefits Paid to New H-1B Workers

As "unqualified" foreign workers, H-1B visa recipients do not qualify for public assistance programs like TANF, SSI, SNAP (food stamps), or Medicaid.[13] Exceptions include emergency services covered under Medicaid and coverage in various states that have chosen to include children of temporary workers and pregnant women who are foreign nationals in their state plans; however, the vast majority of H-1B workers earn more than the income limits that would make them eligible for those programs. H-1B visa holders receive little in government assistance. When the CBO scored the failed 2007 comprehensive immigration bills, it didn't make estimates of the cost of direct spending changes from lifting H-1B visa caps.[14] H-1B workers pay payroll taxes and are eligible for Social Security and Medicare after they work for forty quarters, but this analysis assumes H-1B workers leave the country after six years (minus attrition) and does not estimate budgetary effects after ten years.

The Effect of New H-1B Workers on Wages

The wages of American and foreign workers competing with H-1B visa holders could fall, although it is incredibly difficult to say by how much. Better information on the elasticities of demand and supply will be known when caps are lifted or eliminated. The more elastic demand for labor is, the smaller the downward pressure on wages of new H-1B recipients and current competing workers, both native and foreign. Quotas like the cap on H-1B visas shift markets away from efficient outcomes and clearing prices, as well as shift negotiating power away from workers. Businesses capture most of the surplus of hiring new workers due to the limits on visas; increasing the caps could shift more of the surplus to workers without putting downward pressure on wages.

Some economists have found immigration impacts wages in a negative way, most notably George Borjas.[15] Others studies disagree.[16] Still others have found complementarities, where immigrants and natives adjust to each other in the workforce in mutually advantageous ways. Rachel Friedberg's 2001 paper examining Israel's 12 percent increase in population in just four years following the fall of emigration restrictions from the Soviet Union, bringing an enormous number of high-skilled immigrants, stands out as one of the best natural experiments of its

[13] Ruth Ellen Wasem, "Noncitizen Eligibility for Federal Public Assistance: Policy Overview and Trends," *Congressional Research Service*, September 27, 2012.

[14] Congressional Budget Office, "Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007," June 4, 2007.

[15] George J. Borjas and Lawrence F. Katz, "The Evolution of the Mexican-Born Workforce in the United States," in *Mexican Immigration to the United States*, ed. George J. Borjas [University of Chicago Press, May 2007], 13-55.

[16] Gianmarco I.P. Ottaviano and Giovanni Peri, "Rethinking the Effect of Immigration on Wages," *NBER Working Paper No. 12497*, March 2010.

kind. Friedberg found no adverse impact of immigration on wages of native workers.[17] Finally, immigrant labor can increase purchasing power by lowering prices, an effect left out of many analyses on the effect of wages from immigration.[18]

Conclusion

The estimated effect of raising the caps on new H-1B workers is to increase GDP by $456 billion over ten years, $212 billion of which they would capture themselves and $244 billion that would accrue to current citizens and residents. Federal tax revenue would increase by $113 billion over the same period. The estimates in this analysis are necessarily first-order effects on GDP and federal tax revenues. It is possible that these estimates could be higher due to faster than assumed wage growth, lower than assumed attrition rates, fewer dependents and spouses, and more progressive tax rates at higher incomes. It also possible that more competition in the labor market could adversely affect the wages of native-born workers. The magnitude of these competing effects remains to be seen. Even the most pessimistic assumptions, however, point to a net positive impact on the economy and the federal budget.

[17] Rachel M. Friedberg, "The Impact of Mass Migration on the Israeli Labor Market," *The Quarterly Journal of Economics*, Vol. 116 (4) November 2001, 1373-1408.

[18] Patricia Cortes, "The Effect of Low-Skilled Immigration on U.S. Prices: Evidence from CPI Data," *Journal of Political Economy* 116 (2008): 381-422.