TECHNOLOGY POLICY INSTITUTE
Studying the Global Information Economy

THE BUDGETARY EFFECTS OF HIGH-SKILLED IMMIGRATION REFORM

Arlene Holen

March 2009

The Budgetary Effects of High-Skilled Immigration Reform

Arlene Holen*

Executive Summary

Most economists believe that admitting more highly skilled workers from other countries is beneficial to the U.S. economy. This is particularly true of workers in the fields of science, technology, engineering, and mathematics (STEM).

Immigration also has positive effects on the federal budget. Highly skilled workers pay more in taxes than less skilled workers and they are not likely to receive federal benefits, particularly in the near term.

This paper examines those fiscal effects to help inform the immigration policy debate. The estimates are not precise. They rely on very simple assumptions that are consistent with the economics literature and indicate the magnitudes involved.

The paper finds:

- In the absence of green card and H-1B constraints, roughly 182,000 foreign graduates of U.S. colleges and universities in STEM fields would likely have remained in the United States over the period 2003-2007. They would have earned roughly $13.6 billion in 2008, raised the GDP by that amount, and would have contributed $2.7 to $3.6 billion to the federal treasury.

- In the absence of green card constraints, approximately 300,000 H-1B visa-holders whose temporary work authorizations expired during 2003-2007 would likely have been in the United States labor force in 2008. These workers would have earned roughly $23 billion in 2008, raised the GDP by that amount, and would have contributed $4.5 to $6.2 billion to the federal treasury.

- Similar results are obtained when analyzing legislation considered by Congress during the last few years. For example, under reasonable assumptions, the relaxation of green card constraints proposed in the Comprehensive Immigration Reform Act of 2006 could have increased labor earnings and GDP by approximately $34 billion in the tenth year following enactment and had a net positive effect on the budget of $34 to $47 billion over ten years.

- Relaxation of H-1B caps under the Comprehensive Immigration Reform Act of 2007 could have increased labor earnings and GDP by $60 billion in the tenth year following enactment and improved the federal budget's bottom line by $64 to $86 billion over ten years.

Failing to enact such legislation has been costly to the economy and the federal treasury.

* Senior fellow, Technology Policy Institute. The author thanks B. Lindsay Lowell, Kathy Ruffing, Stuart Anderson, and Thomas M. Lenard for helpful discussions and James L. Riso for able research assistance. Any remaining errors in this paper are my own. The Ewing Marion Kauffman Foundation provided support for this research.

Introduction

Although economists hold different views on the economic effects of immigration in general, they are virtually unanimous in their belief that admitting more highly skilled workers, particularly in STEM fields (science, technology, engineering, and mathematics), is beneficial to the U.S. economy (see e.g., Mankiw 2008). High-skilled immigration promotes technological entrepreneurship, economic growth, and productivity.

It is less well understood that immigration—especially high-skilled immigration—has beneficial fiscal effects at the federal and also possibly the state and local levels (see e.g., Lee and Miller 2000). This paper examines the economic effects of high-skilled immigration and its effects on the federal budget. Its purpose is to provide data and analysis to help inform the immigration policy debate.

Constraints on Admissions in Current Law

High-skilled workers can enter the U.S. labor force by obtaining an employment-based green card, which allows an individual to stay in the United States as a permanent resident, or an H-1B visa, which allows an individual to work here for three years, renewable to six years. Current law limits the annual number of H-1B visas to 65,000 and also exempts up to 20,000 foreign nationals holding a master's or higher degree from a U.S. university from the cap. H-1B petitions far exceed the number of slots and are allocated through a random selection process. Most H-1B visa holders and their employers hope to be able to convert their H-1B visa to a green card, so they can stay permanently.

The current annual cap on green cards for skilled workers is 40,000 and there is a five-year backlog of applications. (There are separate caps of 40,000 for priority workers with extraordinary ability and also for professionals holding advanced degrees.) Per-country caps further limit admissions, especially of applications from China and India. The result of these constraints is that many high-skilled workers in scientific and technical fields who are currently working in the United States on temporary H-1B visas are forced to leave their jobs each year and return home. Similarly, many foreign students completing scientific and technical training at U.S. colleges and universities who would otherwise remain and work in the United States are returning to their home countries, taking their U.S.-acquired human capital with them. This loss

of human resources imposes significant costs on the U.S. economy and constitutes a drain on federal revenues.

Over the past three years, Congress has considered comprehensive immigration reform packages that increased employment-based admissions and other, more narrowly targeted bills. Immigration issues are likely to be revisited during the coming months as technology spending in the stimulus package boosts demand for engineers, individuals with advanced degrees, and other skilled workers, at the same time as news of layoffs raise concerns about the jobs and wages of domestic workers.

Background

The Congressional Budget Office (CBO) has concluded that immigration overall affects federal finances positively (2006c, p. 4; 2007c, p. 1). The fiscal implications of admitting and retaining more high-skilled workers, through either employment-based green cards or H-1B visas, appear to be especially favorable. This result holds primarily because high-skilled workers pay more in taxes than low-skilled workers and are less likely to receive public benefits. (For a detailed explanation of the benefits side of the ledger, see Appendix A, Federal Benefits Resulting from Increasing High-Skilled Immigration.)

CBO's analyses are widely cited, although certain key aspects—notably on the tax side—are scantily explained. Thus the favorable budget effects of high-skilled immigration, which could facilitate new legislation, are not widely understood and have received little attention. Budget scores are often critical to the passage of legislation. Measures with positive scores are sought by members of Congress as offsets to the cost of other legislation and for inclusion in legislative packages.

Only CBO issues official scores and does so for legislation that has been passed by Congress or reported by a Committee. Tax revenues are estimated by the Joint Committee on Taxation (JCT) and incorporated into CBO's cost estimates; however revenue estimates are not reported or explained in detail. Official cost estimates depend on precise legislative wording.

The estimates in this paper are designed to approximate the types of estimates made by the Congressional Budget Office in preparing budget baseline estimates and in scoring legislative proposals.

Many of the estimates in this paper are necessarily hypothetical. Nevertheless, they are intended to be consistent insofar as possible with CBO's methodology as explained in its cost estimates and analyses and also with academic studies of the effects of immigration on the economy.

Empirical Analyses of the Effects of Immigration

Examining how immigration affects the well-being of U.S. workers is complex. The effects of immigration extend over many years and it is difficult to isolate its effects from those of other factors.

A number of studies have estimated labor market outcomes for domestic workers that result from the presence of foreign-born workers. In principle, to the extent foreign-born workers have similar skills and experience as native workers, they would compete with native workers for jobs and tend to lower their wages. But immigrants in general have different characteristics than native workers. Among other differences, they more frequently hold advanced degrees. Differences between domestic and immigrant workers in education and skills can lead to complementarities that result in benefits including higher earnings for domestic workers.

Studies of the effects of immigration on labor markets have taken two approaches: some have focused on areas where there were large increases in the number of immigrants while others have looked at nationwide variations in the number of immigrants over time. A study by George Borjas, examining detailed census data on native workers, concluded that a 10 percent increase in workers in a particular education-experience group would reduce weekly earnings in that group by roughly 4 percent before adjustments in new investment in capital or before investments in skills by workers are made (Borjas 2003).

Most recent studies have found little effect of immigrants on domestic workers (e.g. Card 1990). A review of the empirical literature by the National Research Council concluded that there is

only a weak relationship between native wages and the number of immigrants. One group that appears to be most affected are immigrants from earlier waves for whom the more recent immigrants are close substitutes in the labor market (Smith and Edmonston 1997, p. 6).

Secondary economic adjustments to immigration occur because immigrants stimulate the demand for capital and also encourage domestic workers to invest in more education. A subsequent study by Borjas concluded that if there were complete adjustment of the capital stock, immigrants would have no adverse effect on native workers' earnings (Borjas 2005). One recent analysis that examined adjustment costs concluded that capital generally adjusts quickly to changes in other factors of production (Hall 2004). A study of immigrants' wage effects that took account of adjustments in the capital stock concluded that immigration tends to slightly raise the average wages of domestic workers and that the effect is greater when capital has had more time to adjust (Ottaviano and Peri 2006). A more recent study by the same authors found that in the long run, immigration has a small positive effect on average native wages and on the wages of native workers without a high school degree (Ottaviano and Peri 2008).[1]

Dynamic Estimates

At the outset, it is important to note that CBO's general practice in preparing cost estimates, following longstanding Congressional budget procedures, is not to incorporate the budgetary effects of changes in the economic outlook, commonly referred to as "dynamic scoring." That is, gross domestic product (GDP) is taken to be fixed (CBO 2009, p. 2). In its cost estimates of major immigration legislation, however, the agency has departed from that practice and has taken its macroeconomic effects into account (CBO 2006c, p. 7). CBO estimated, for example, that S. 2611, the Comprehensive Immigration Reform Act of 2006, would add about 2.5 million employees to the workforce by 2016, mostly through its guest-worker program and through raising the caps on the number of legal immigrants. The work performed by those additional employees would raise the level of GDP, other things being equal, by increasing the production of goods and services. Alternatively, the agency reasoned, tightened border security and more

[1] These studies are about the effects of immigration in general. High-skilled immigration raises the stock of human capital, which might be expected by itself to raise complementary workers' wages.

stringent enforcement of compliance with immigration laws could dampen the growth of the labor force by slowing net inflows of unauthorized workers.

Beyond those direct effects on the workforce, comprehensive immigration legislation can boost the economy in other ways, most prominently by increasing the amount of investment. In its estimate of the effects on revenues of the Comprehensive Immigration Reform Act of 2006 (S. 2611), on revenues, JCT included the effect of both additional wages earned by immigrants and reduced wages for other workers resulting from an influx of new workers (CBO 2006c, p. 8).

On net, CBO concluded that, notwithstanding many uncertainties surrounding assessments of the budgetary impact of proposed immigration policies, S. 2611 would increase economic growth by a small degree and could improve the financial outlook for the Social Security system, although not by enough to avert the funding shortfall projected in Social Security's long-term outlook. The agency's review of the existing research literature on immigration found that, in aggregate and over the long term, tax revenues generated by immigrants exceed the cost of the services they receive (CBO 2007c, p. 1). An important factor that affects budgetary impact is the skill level of new workers—policies that provide more access for higher-skilled workers would yield more favorable budgetary effects than policies that provide more access for lower-skilled workers.

Uncertainties in Projecting Immigrant Visas

Congressional debates on immigration reform are usually contentious and based on differing views of how resulting changes in immigrant flows would affect U.S. residents. But the translation of legislative provisions into expected numbers of new entrants to the United States, especially provisions that would make major changes to current law, is highly uncertain. There are no straightforward methods for making such estimates and there is often no clear answer to the question of how a particular piece of legislation would affect the number of immigrants admitted in the future. Widely varying projections make it difficult for analysts to assess economic and budget effects and make it more difficult for Congress to find agreement.

For example, in considering S. 2611 it was not clear, even to experts examining the specific language of the legislation, what visas were set aside for specific immigration classes, what visa classes and occupations were exempted from numerical caps, and how the escalators and contingent provisions would work. Also uncertain were potential interactions among provisions and reasonable assumptions for mortality and emigration. Experts' projections also varied according to whether they considered visas that could potentially be made available under the terms of the legislation, whether they took into account potential labor market conditions and labor supply factors, and whether they took into account administrative bottlenecks. Additional elements of uncertainty were future family multipliers and naturalizations.

A panel of experts considered the ramifications of S. 2611 in October 2006 (Lowell and Bump 2006). The experts' projections of incremental overall immigration, even using reasonably comparable definitions, ranged from 14.5 to 47 million people over 20 years.

Budget Effects of Visa Fees and Fines

The budget effects of the various fees and fines incorporated in immigration legislation are also not straightforward—the anticipated amount of funds collected cannot be simply added up and taken to represent positive effects on the budget. The reason is that the income generated is typically made available to various federal departments such as the Department of Homeland Security, the State Department, the Department of Labor, the National Science Foundation, and the Department of Health and Human Services, to cover activities such as processing costs and increased adjudications, to improve enforcement of immigration laws, for educational activities, and for grants to states to provide services to noncitizens. Because there is a lag between the collections and outlays, however, budget effects, although positive, tend to be relatively small for the ten-year period the Congressional Budget Office typically takes into account in its cost estimates. Over the long term the lags are unimportant and the net effects of visa fees and fines are very small.

For example, Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007, provided that H-1B nonimmigrants and others with advanced degrees admitted under the legislation would, along with their employers, be required to pay fees ranging from $320 to $3,500. CBO estimated that annual admissions would exceed 100,000, thus increasing offsetting

receipts by about $7.0 billion over the 2008-2017 period. However, CBO's cost estimate of June 4, 2007 concluded that collections would be spent by various departments and that because spending would lag collections for several years, the net effect on outlays would be a reduction of only $2.2 billion over the ten-year period.

Similarly, applicants for green cards in that legislation would pay fees totaling about $500 and CBO estimated that the provision would increase offsetting receipts by about $500 million over the 2008-2017 period. Those collections and State Department surcharges for immigration visas, however, would be spent mostly in the same year as received, so the net positive budgetary effect over the ten-year period would be only about $15 million.

Estimates of the Fiscal Effects of High-Skilled Immigration Restrictions

The estimates in this paper show significant positive fiscal effects from loosening entry constraints on the admission of high-skilled workers to the United States. They are based on data that come from a number of sources. In some cases they present ranges associated with various scenarios. The estimates are designed to give policy makers, interest groups, and the public relevant information on the economic and budget ramifications of current and potential policies that affect immigration of high-skilled workers to the United States. The estimates are not precise—they rest on very simple assumptions and counterfactuals—but they provide an indication of the magnitudes involved.

The results for various legislative scenarios are meant to be illustrative. Official budget estimates that are used in the Congressional budget process rest on the precise wording and interpretation of legislative language. The translation of legislative provisions into expected numbers of new entrants to the country, especially those that would make major changes to current law is highly uncertain, as explained above.

This paper makes the general assumption that the projected earnings of new immigrants contribute an equivalent amount to GDP. Some factors that underlie that assumption may bias the resulting estimates upward—for example, adjustments are not made for unemployment among added workers or for negative effects they may have on the employment and earnings of existing workers. The literature suggests these effects are likely to be small.

Other factors, which are likely to be larger, may bias the estimates downward. For example, adjustments are not made for labor complementarities, filling jobs that alleviate labor market shortages, or for factors that serve to increase the productivity of existing workers and therefore raise their wages. These are positive effects that one would expect from an increase in highly trained workers, particularly those in science, technology, engineering, and mathematics fields. Nor are adjustments made for additional investments that would be induced by attracting more capital investment. Labor substitution and complementarities are examined in the empirical studies cited above as are the effects of induced incremental investment. Further, the added work of spouses and dependents of green-card holders, which are not taken into account here, would serve to raise GDP. The estimates take into account expected emigration. The net effects of simplifying assumptions should be that the estimates are conservative.

The major findings are summarized below. Appendix B, together with the tables, explains in detail the methodology used to derive the results.

STEM graduates of U.S. colleges and universities

These results broadly describe how the federal budget and the economy are affected by caps on employment-based green cards and H-1B visas that keep foreign STEM graduates of American colleges and universities from remaining in the United States. See Table 1, Foreign Graduates in STEM Fields.

- Over the five years 2003-2007, 143,391 bachelor's degrees, 255,267 master's degrees, and 49,532 doctoral degrees were granted to non-resident aliens in STEM fields by U.S. colleges and universities in the United States.

- Roughly 193,000 foreign STEM graduates would have remained in the United States in the absence of employment-based entry constraints over the period 2003-2007. Adjusting for annual emigration, roughly 182,000 would have been in the U.S. labor force in 2008.

- Those STEM graduates would have earned roughly $13.6 billion in 2008 and the GDP would have been that much greater if those graduates had not been excluded from the U.S. labor force.

- The loss to federal revenues resulting from the exclusion of those foreign STEM graduates was approximately $2.7 to $3.8 billion.

- Because those foreign graduates are young, self-selected, highly educated, and have excellent employment opportunities, the likelihood they would receive federal benefits such as Medicare, Social Security, Medicaid, or other health or income-related benefits is extremely low in the near term.

Temporary high-skilled workers

These results broadly describe how the federal budget and the economy are affected by green card caps that limit the adjustment of H-1B visa holders to permanent residence status. In the absence of green card constraints, many H-1Bs would remain in the U.S. labor force after their temporary status expires. See Table 2, H-1B Estimates.

- About 330,000 H-1B visa-holders whose temporary work authorizations ran out during 2003-2007 would have been working in the United States in 2008 had they been able to get green cards and become permanent legal residents. Adjusting for annual emigration, roughly 300,000 of them would have been in the U.S. labor force in 2008.

- Those H-1Bs would have earned roughly $23 billion in 2008 and the GDP would have been that much greater had they been able to get green cards and become permanent legal residents.

- The loss to federal revenues in 2008 resulting from those H-1B workers excluded by green card constraints was approximately $4.5 to $6.2 billion.

- This group is highly unlikely to receive federal benefits such as Medicare, Social Security, Medicaid, or other health or income-related benefits in the near term.

- Using estimating parameters over a wider range, the loss to federal revenues in 2008 was $2.3 to $11.1 billion.

Legislation to raise caps on green cards

These results, presented in the format of CBO cost estimates, broadly describe how the federal budget and the economy would be affected by several legislative scenarios to raise green card caps. See Table 3, Budget Effects of Increasing Employment-Based Green Card Caps.

Scenario IA is the increase under S. 2611, the Comprehensive Immigration Reform Act of 2006. The act called for increasing the green card cap to 650,000 plus any unused employment-based visas from the previous six years. The new cap would apply to both workers and their dependents; the unused visas from prior years would apply only to workers. The act also expanded the types of individuals no longer subject to annual limits on legal immigrants.

- Based on CBO's estimates of cumulative new green card holders, S. 2611 would have led to increased labor earnings and increased GDP of almost $180 billion over the ten years following enactment and by almost $34 billion in the tenth year.

- Federal revenues from added green card workers would have increased by roughly $35 to $47 billion over ten years and federal costs for programs such as Medicaid and student loans would have risen by less than $1 billion.

- The net positive budgetary effect of the green card provisions of S. 2611 over ten years would have been approximately $34 to $47 billion.

Scenario IB also shows results for S. 2611, but for the subset of highly skilled workers in computer and engineering occupations. Scenario IB also differs from IA in that it relies on different assumptions from CBO's, which result in a far greater increase in the number of green card admissions under the terms of the legislation.[2]

- Under this alternative scenario, labor earnings and GDP would have increased by more than $390 billion in the ten years following enactment and by about $78 billion in the tenth year.

- Federal revenues would have increased by $77 to $105 billion over ten years.

Scenario II is the green card increase under Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007. The new green card cap would be approximately 260,000 in fiscal year 2008, the first year that would have followed enactment.

- The additional green card holders would have earned roughly $35 billion over ten years, raising GDP by that amount, and by roughly $7 billion in the tenth year.

- Federal revenues would have increased following enactment of Senate Amendment 1150 by some $7 to $9 billion over ten years.

- Federal costs for programs such as Medicaid and student loans would have increased by about $275 million over ten years and new visa fees would have reduced outlays by $15 million, leaving the net budget impact virtually unchanged.

Legislation to raise H-1B caps

These results, also presented in the format of CBO cost estimates, describe how the federal budget and the economy would be affected by two scenarios to raise H-1B caps. See Table 4, Budget Effects of Increasing H-1B Caps.

Scenario I is the Comprehensive Immigration Reform Act of 2006. The new H-1B cap would increase the number of visas available each year for persons with a bachelor's degree or higher and certain other persons with advanced degrees by about 100,000. This scenario applies specifically to workers in computer and engineering fields.

[2] One key difference in assumptions is that Scenario IB considers the visas that could potentially be made available under the terms of the legislation while CBO assumes that administrative bottlenecks would limit the increase in new green card entrants (For more detail see Appendix B, Estimates).

- Additional computer and engineering workers under the higher H-1B caps of S. 2611 would have boosted the nation's labor earnings and GDP by roughly $150 billion over ten years and by $25 billion in the tenth year.

- Federal revenues would have been roughly $30 to $40 billion higher over ten years, for a positive fiscal effect in that range.

Scenario II is the increase in H-1B caps under Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007. The new H-1B cap would increase the annual number by about 100,000.

- Higher H-1B caps under Senate Amendment 1150 to S. 1348 would have added roughly $315 billion to labor earnings over ten years and by $25 billion in the tenth year.

- Additional federal revenues would have come to about $61 to $84 billion over ten years and improved the federal budget's bottom line by about $64 to $86 billion over that period.

Conclusion

The flow of highly skilled immigrants to the United States increases entrepreneurship, economic growth, and productivity. This paper finds that high-skilled immigrants also have substantial positive effects on the federal budget. Such workers pay more in taxes than low-skilled workers and are less likely to receive federal benefits, particularly in the near term.

The estimates in this paper are intended to provide relevant information to policy makers on the economic and budget implications of high-skilled immigration reform. The estimates are not precise—they necessarily rest on simplifying assumptions—but they provide an indication of the magnitudes involved.

The economy would have been larger and the federal budget deficit would have been substantially reduced if foreign graduates of U.S. colleges and universities had not been constrained by green card and H-1B caps or if temporary workers could freely adjust to permanent resident status.

Similar results are obtained when analyzing legislation considered during the last few years to relax those labor market constraints. Failing to enact such legislation has been costly to both the economy and the federal treasury.

Appendix A:
Federal Benefits Resulting from Increasing High-Skilled Immigration

High-skilled immigrants and temporary workers are generally relatively young or in their prime working years, are self-selected, highly educated, and are in high demand by employers. Thus, such individuals are their dependents are unlikely to receive federal benefits such as Social Security, Medicare, Medicaid, or other health or income-related benefits during the ten-year period that is used in scoring Congressional legislation.

The Congressional Budget Office, in its cost estimate of Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007, noted that over the next 10 years, the additional spending resulting from that broad legislative reform would be primarily for refundable tax credits and Medicaid, but that outlays for other programs would also rise. Those increases would be partially offset by collections from various fees that are recorded as offsets to outlays. The impact on other mandatory programs would be much smaller because they have fixed funding, place more restrictions on the eligibility of noncitizens, or would not experience a significant increase in spending until after the ten-year budget period. Legislation enacted in 1996, the Personal Responsibility and Work Opportunity Reconciliation Act, limited the eligibility of noncitizens for public benefit programs. In general, CBO assumed that new participants within federal programs would resemble similarly-situated foreign-born individuals who currently participate in those programs.

CBO concluded that Medicaid spending for emergency and other services would rise as a result of the additional employment-based immigration allowed under Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007, in the same ways as additional family-sponsored immigration. But the increase in the number of employment-based immigrants would have a smaller impact on Medicaid spending because all of those immigrants would be employed, and thus less likely to qualify for Medicaid benefits. Also, because a larger share of them are already in the United States, many would have been already eligible for emergency services.

CBO estimated that the increase in employment-based immigrants would raise federal Medicaid spending by about $80 million over the ten-year budget period. The agency estimated that

spending for food stamps would rise by about $35 million over 10 years; for Social Security, Medicare, and Supplemental Security Income spending would rise by $80 million over ten years; and that the estimated subsidy cost of spending for student loans would rise by about $80 million over ten years. The estimate of total federal benefits comes to $275 million over ten years.

CBO's cost estimate of Senate Amendment 1150 to S. 1348 does not separately identify federal benefits that would result from increasing H-1B visas in that legislation, suggesting that such increases would likely be negligible. CBO's cost estimate for S. 2611, the Comprehensive Immigration Reform Act of 2006, indicates increased direct spending for additional H-1B visas and persons with advanced degrees of $600 million over ten years.

Appendix B: Estimates

Economic and budget effects under current law of foreign graduates U.S. of colleges and universities and temporary high-skilled workers returning to their home countries as a result of constraints on employment-based green cards.

The estimates in this section may be thought of as "looking behind" a federal budget baseline. They are not in themselves baselines under current law, i.e. what economic and budget conditions would be in the absence of legislative change. The estimates broadly describe how the economy and the budget are affected by a resource constraint in current law, caps on employment-based green cards and H-1B visas that sharply limit the supply of foreign born workers in science, technology, engineering, or mathematics (STEM) who would otherwise be engaged in productive economic activity. The estimates may also be thought of as the opportunity cost to the economy and the federal budget of barriers to U.S. entry of highly skilled foreign workers.

Foreign STEM graduates

The data underlying estimates in this section are shown in Table 1, Foreign Graduates in STEM Fields.

The first step in the estimating process is to determine the number of foreign student graduates in STEM fields in recent years. The annual number of graduates is a flow. The number that would otherwise be working in the United States is a stock, i.e. those at a point in time that would be part of the U.S. labor force. The number of graduates in past years to be included was chosen to be five—to provide a reasonable idea of the effects of green card constraints over the past five years on the federal budget in a single year: 2008.

The data on foreign STEM graduates over the period 2003 to 2007 come from IPEDS (Integrated Postsecondary Education System), a data set provided by the National Center for Education Statistics.[3] The data were collected in 2007 and represent degree completions in public and

[3] Available on their website at http://nces.ed.gov/ipedspas/dct/index.asp

private colleges and universities at the bachelor's, master's, and doctoral levels, for non-resident aliens whose primary major was in STEM fields. The ten primary, 2-digit, STEM field codes were taken from a publication of the U.S. Immigration and Customs Enforcement Agency (ICE 2008). These are instructional programs that have been designated by ICE as science, technology, engineering, or mathematics degrees for the purpose of approving a 17-month STEM extension of optional practical training.

Over the five years 2003-2007, 143,391 bachelor's degrees were granted in STEM fields in the United States to non-resident aliens, 255,267 master's degrees, and 49,532 doctoral degrees.

B. Lindsay Lowell, Director of Policy Studies of the Institute for the Study of International Migration at Georgetown University, roughly estimates that over the period 1999-2003, 30 percent of foreign students granted master's degrees adjusted from foreign student visa status to legal permanent resident (green card) status following graduation, and slightly over 20 percent adjusted to temporary worker (H-1B) status (Lowell 2007). From this we may infer that some 50 percent of foreign master's recipients would have returned to their home countries or pursued further education here on account of those U.S. entry constraints.

Lowell's comparable estimates for foreign doctoral recipients adjusting from student visa status to green card and H-1B status indicate that roughly 25 percent adjust to become legal permanent residents and 45 percent remain in temporary worker status. Thus, we may infer that about 30 percent of foreign PhD recipients returned to their home countries following graduation on account of entry constraints or pursued post-doctoral education here. Lowell observes the strong interest of such foreign students to remain and work in the United States (Lowell 2000, pp. 14-15). The National Science Foundation (2008) reports that among 2002 to 2005 graduates, roughly three-fourths of foreign doctoral recipients in science and engineering fields planned to stay in the United States after graduation, with a much higher share for Indians and Chinese recipients.

Because foreign recipients of bachelor's degrees in STEM fields may be expected to have formed weaker ties to the United States than those receiving more advanced degrees and are

likely to have relatively weaker job prospects, we estimate a lower percent than for master's degree recipients would have been able to adjust their status and remain in the country—roughly 30 percent. Thus, approximately 70 percent returned to their countries of origin or continued their education here. We estimate conservatively that some half of those, or 35 percent of foreign bachelor's degree recipients in STEM fields, would have worked in the United States in the absence of legal entry constraints.

Overall, we calculate that some 193,000 foreign STEM graduates would have remained in the United States in the absence of employment-based entry constraints over the period 2003-2007. Adjusting those figures for annual rates of normal emigration of 3.2 percent (see Lowell and Bump 2006), we estimate that roughly 182,000 would have remained in the U.S. labor force in 2008.

What would the earnings of those graduates have been and what would they have paid in federal taxes? Data on annual earnings by occupation are reported by the Bureau of Labor Statistics (BLS 2008). Annual mean earnings for computer and mathematical science occupations were $72,190. Earnings were higher in engineering fields, roughly $80,000, and also in life and physical science occupations. Assuming earnings of $75,000, we estimate that overall the group would have earned roughly $13.6 billion in 2008 and the GDP would have been that much greater if those graduates had not been excluded from the U.S. labor force.

The Tax Policy Center (TPC) of the Urban Institute and Brookings Institution has developed a microsimulation model that is designed to mimic revenue estimates of the Joint Committee on Taxation and calculate the federal income tax liability of sample families (Lieserson 2006). The TPC estimates for 2006 federal income tax liability of $10,388 for a single person earning $75,000, and $7,363 for a head of household with one child earning that amount. Taxes for a married person filing jointly with no children are indicated to be $6,985, and $5,490 with one child. Recent graduates of colleges and universities are young and beginning their careers. Many are likely to be single; they will marry and have children over the years. We roughly estimate their annual federal income tax liability to be $9,000. The FICA tax, including the employer and employee shares, would come to roughly $11,000.

Thus, annual federal revenues forgone in 2008 for each foreign graduate over the past five years who otherwise would have worked at STEM jobs in the United States but for green card and other entry constraints, comes to roughly $20,000, or a loss to the federal budget of about $3.6 billion in 2008.

Because those foreign graduates are young, self-selected, highly educated, and have excellent employment opportunities, the likelihood they would receive federal benefits such as Medicare, Social Security, Medicaid, or other health or income-related benefits is extremely low in the near term.

Alternative tax liability estimates are based on CBO's *Historical Effective Tax Rates*, using the fourth earnings quintile (CBO 2007b). Average household earnings for that quintile are $84,500 and the effective federal tax rate is 17.3 percent, yielding an estimated loss of federal revenue of $270 billion in 2008.

Temporary high-skilled workers

The underlying estimates in this section are shown in Table 2, H-1B Estimates.

The first step in the estimating process is to determine the number of temporary employment visa-holders in the United States in recent years. That number is conceptually a stock; the annual numbers who leave the country but would otherwise have remained in the absence of green card caps constitute annual flows. The sum of the outflows over a period of years (we choose five years for this purpose, 2003 to 2007, as above for estimates of foreign graduates) is then roughly the stock of workers who otherwise would have been engaged in productive economic activity in a single year, 2008. As explained above, looking at the effects on the federal budget of such loss of economic resources amounts to looking behind the budget baseline.

Unfortunately, official data are not collected on the number of H-1B workers in the country, but several researchers have made estimates. They vary widely:

B. Lindsay Lowell estimated the H-1B population in 2006 to be roughly 500,000 and 425,000 in 2000 (Lowell 2006). Elizabeth M. Grieco (2006) estimated that the U.S. population of temporary workers, including those on L visas and spouses, was 704,000. Grieco's estimates are based on administrative data. Jacob Funk Kirkegaard (2007, pp. 41-42) estimated the number of H-1B visa holders in the United States was between 370,000 and 770,000 in 2005.

Starting with Lowell's estimate of an H-1B visa population of 500,000, we begin by roughly estimating the number whose visas could expire each year to be between 83,000 and 167,000 (83,000 if all stayed in the United States the maximum 6 years—3 years initially with a 3 year extension—and 167,000 if they stayed for only 3 years). The Office of Immigration Statistics reports that roughly half of H-1B approved petitions were for initial employment and half for continuing employment in FY 2002 and FY 2003 (OIS 2004). Legislation in 2000 provided that individuals with H-1B visas may continue to work if they have a green card application pending. We allow this condition to diminish our range by 10 percent and very roughly estimate the annual average number of expirations may be on the order of 112,000 (the midpoint).

We assume that the vast majority of workers with expiring H-1B visas would adjust to permanent resident status if they could. Caps on green cards, especially when combined with per-country limits, are an increasingly binding constraint on temporary high-skilled workers' ability to adjust to permanent status and remain to work in the United States. Lowell observes that the size of the adjusting population is driven by the proportion that desire and pursue permanent resident status. He anticipates that the share of temporary H-1Bs who desire to remain permanently increases over time as their composition reflects more distant countries of origin and as they shift to increasingly technical occupations (Lowell 2000).

The number of green cards potentially available each year for those H-1B workers adjusting to immigration status is 120,000 (40,000 for skilled workers and professionals, and 40,000 each for the categories of priority workers with extraordinary ability and for professionals holding advanced degrees). But approximately 55 percent of employment-based green cards subject to quotas go to spouses and dependents, leaving some 54,000 for workers themselves. Thus, roughly 59,000 H-1B workers are estimated to have returned each year to their countries of

origin over the five years 2003 to 2008, on account of green card constraints. This figure is adjusted upward to roughly 67,000 to account for the issuance of green cards to new arrivals to the United States, leaving fewer for those making adjustments in status (OIS 2006-2008, Table 7). Jacob Funk Kirkegaard concludes that the vast majority of high-skilled employment-based immigrants, especially in the highest-skilled categories, adjusted their status rather than constituting new arrivals (Kirkegaard 2007, p. 34 and Figure 2.1). Per-country caps, which are especially restrictive to applicants from India and China, constitute other stringent constraints on green cards available to H-1B holders. These are not considered here.

This rough estimate of 67,000 annual H-1B returnees seems reasonable in light of Lowell's estimates in the range of 80,000 to 90,000 for 2001 and 60,000 to 70,000 for 2002 (Lowell 2007). Lowell also forecasted roughly 30,000 to 40,000 H-1B workers adjusting to permanent legal status each year over the period 2003 to 2007 (Lowell 2000, Figure 4). Combining those figures with the estimates above of 75,000 to 150,000 H-1B expirations each year yields a range of 35,000 to 120,000 annual H-1B returnees.

Overall, we calculate that over 330,000 H-1B workers whose temporary work authorizations ran out during the period 2003-2007 would have been living and working in the United States in 2008 had they been able to get green cards and become permanent legal residents. Adjusting for annual emigration the estimate is roughly 308,000.

If each had earned $75,000, a very conservative figure for this group, they would have earned roughly $23.1 billion in 2008 and the nation's GDP would have been that much greater. Using TPC's microsimulation estimates, the annual federal income tax liability as estimated above for foreign STEM graduates of $9,000, and FICA tax liability of $11,000, again very conservative figures, we calculate the loss to federal revenue in 2008 to be about $6.2 billion. This group is highly unlikely to receive federal benefits in the near term such as Social Security, Medicare, or Medicaid. Using CBO's estimates of federal tax liability based on effective tax rates yields a $4.5 billion loss in federal revenues in 2008.

Applying the range above for annual H-1B returnees of 35,000 to 120,000 who in the absence of constraints on becoming legal permanent residents would have remained here, we estimate that roughly 160,000 to 557,000 individuals would have been living and working in the United States in 2008 after annual emigration of 3.2 percent. The group's annual earnings in 2008 would have been between $12 billion and $41.7 billion. We estimate the loss to federal revenues in 2008 from avoidable returns of H-1B workers to their home countries was between $3.2 billion and $11.1 billion using TPC's estimates. The federal revenue loss is $2.3 billion to $8.1 billion under CBO's figures.

Economic and budget effects of legislation to increase annual caps on green cards issued to high-skilled workers.

The estimates in this and the following section, which addresses H-1B caps, are presented in the format of CBO cost estimates. They are based on assumed changes in law relative to a current law baseline, consider both revenue and cost effects, and present estimates for ten years following enactment along with ten-year totals. As spelled out above, the estimates are "dynamic" in the sense that they do not assume the GDP is fixed but that it would rise along with increases in the U.S. labor force.

The estimates in this section are shown in Table 3, Budget Effects of Increasing Employment-Based Green Card Caps. Table 3 presents two legislative scenarios: Scenario I is the increase in green card caps under S. 2611, the Comprehensive Immigration Reform Act of 2006 and Scenario II is the increase under Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007.

Two sets of estimates are shown for the 2006 legislation. The first, under Scenario IA, is based on CBO's actual cost estimate and takes as its starting point CBO's projected cumulative new entrants—employment-based admissions and exclusion of certain immigrants from limits. The provisions of that legislation, as is true of much immigration legislation, were extremely complex.[4] Translating their actual effect into expected numbers of new entrants is highly

[4] The new green card cap would be 650,000 plus any unused employment-based visas from the previous six years. The new cap would apply to both workers and their dependents; the unused visas from prior years would apply only to workers. The act would also expand the types of individuals no longer subject to annual limits on legal

uncertain and dependent upon potential interactions among provisions and on a variety of assumptions, including those for mortality and emigration.

CBO's cost estimate does not break out the revenues associated with various types of new entrants—for example, guest workers, family-sponsored admissions, and employment-based admissions. So the revenue estimates were derived, as described above, from CBO's estimates of the number of cumulative new green-card entrants as a result of the legislation combined with rough estimates of what they would have earned and the federal taxes they would have paid. The estimates rest on the assumption that 45 percent of cumulative new entrants would be primary workers, with 55 percent of new entrants accounted for by spouses and dependents, as explained above. The estimates again assume annual individual earnings of $75,000 and again project federal revenues as above, following calculations by the Urban-Brookings Tax Policy Center and by CBO, in its *Historical Effective Tax Rates* (denoted in the tables as *a* and *b*, respectively).

Federal costs are shown for direct spending programs such as Medicaid and student loans, as estimated by CBO for employment-based admissions and for the exclusion of certain immigrants from limits. CBO's cost estimate for S. 2611 does not break out the budget effects of various provisions related to fees and fines. Indeed, the budget effects of fees and fines in immigration legislation are not straightforward. The funds collected cannot simply be added up and taken to represent positive effects on the budget because future outlays by several federal agencies are closely linked to the collections.

The overall effects of the green-card provisions in S. 2611 would have resulted in increased labor earnings and increased GDP of almost $180 billion over a ten year period and $34 billion in the tenth year. Federal income and social insurance taxes would have gone up by roughly $35 to $47 billion and federal costs would have risen by less than $1 billion. The net positive budgetary impact over the ten-year period would have been $34 to $47 billion.

---

immigrants. But CBO concluded that most of the immigrants who would be excluded would have otherwise been eligible for employment-based green cards (CBO 2006b, p.8).

Scenario IB of Table 3 also describes budget effects of S. 2611 using a CBO cost estimate format, but for a subset of new green card workers—highly skilled foreign computer and engineering workers. Scenario IB takes as its starting point the projections of B. Lindsay Lowell of Georgetown University (Lowell 2006). Lowell's estimates are thus for a narrower population of new entrants than CBO's and he makes different underlying assumptions, which he spells out in detail. One key difference is that CBO assumes administrative bottlenecks would limit the increase in new green card entrants that would result from the legislation while Lowell considers the visas that could potentially be made available. Lowell interprets the Senate bill to allow a fivefold increase in employment-based green cards, significantly larger than CBO's estimates (Lowell and Bump 2006).

Thus, even though Scenario IB considers a subset of new green card workers, the estimated economic and budget effects of S. 2611 are much larger in Scenario IB than IA. The green card provisions of S. 2611 in Scenario IB would raise labor earnings and GDP by more than $390 billion over a ten year period and by $78 billion in the tenth year. Federal income and social insurance taxes would increase by $77 to $105 billion over ten years. Federal costs are not estimated for this scenario but they are likely to be small.

Scenario II, increasing green card caps under Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007,[5] is estimated similarly to Scenario IA, and is based on CBO's cost estimate. The additional green card holders would have earned about $35 billion over ten years, raising GDP by that amount, and by $7 billion in the tenth year. For this scenario, CBO shows estimates for visa fees and fines as well as for added direct spending on programs such as Medicaid and student loans. Netting out added direct spending of $275 million over ten years and including positive effects of visa fees and fines of $15 million yields a net positive budgetary impact over ten years of roughly $7 to $9 billion.

[5] The new green card cap would be approximately 260,000 in fiscal year 2008, the first year following enactment. The cap would be lowered to 140,000 in 2013 (CBO 2007a, p. 21).

Economic and budget effects of lifting annual caps on H-1B temporary high-skilled workers.

The estimates in this section are shown in Table 4, Budget Effects of Increasing H-1B Caps. Table 4 presents two legislative scenarios: Scenario I is the Comprehensive Immigration Reform Act of 2006[6] and Scenario II is Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007.[7]

Scenario I describes the effects of higher H-1B caps under S. 2611 using a CBO cost estimate format for a subset of new H-1Bs—highly skilled foreign computer and engineering workers. The starting point is projected cumulative new H-1B workers as estimated by B. Lindsay Lowell (Lowell 2006). Added labor earnings are estimated as before, and estimated federal revenues again follow from calculations by the Urban-Brookings Tax Policy Center and CBO in *Historical Effective Tax Rates*. Labor earnings and GDP would increase for this subset of workers by about $150 billion over a ten year period (by $25 billion in the tenth year). Federal revenues would rise by roughly $30 to $40 billion over ten years, for a positive effect on the budget in that range.

Scenario II describes the effects of higher H-1B caps under Senate Amendment 1150 and takes as its starting point CBO's projection for new H-1B visas associated with the legislation. Added labor earnings and projected GDP would rise by about $315 billion over ten years (by $60 billion in the tenth year). Federal revenues would rise by roughly $61 to $84 billion over ten years. Federal costs are not estimated for these H-1B scenarios but are likely to be small. CBO estimates positive budget effects of visa fees of $2.2 billion over ten years stemming from reduced outlays, for a net positive budget effect of about $64 to $86 billion over ten years.

[6] The new H-1B cap would increase the number of visas available each year for persons with a bachelor's degree or higher and certain other persons with advanced degrees. The annual number of such individuals would be about 100,000 (CBO 2006a, p. 26).

[7] The new H-1B cap would increase the annual number of H-1B immigrants and others with advanced degrees by about 100,000 (CBO 2007a, p. 26).

Table 1
Foreign Graduates in STEM Fields

- STEM Degrees Awarded to Nonresident Aliens

	2003	2004	2005	2006	2007	Total
Bachelor's	27,226	28,641	29,221	29,392	28,911	143,391
Master's	51,315	54,089	51,885	50,473	47,505	255,267
Doctor's	7,580	8,610	9,830	11,288	12,224	49,532
						448,190

- Status Following Graduation

	Adjusted to:		Left US or pursued further education
	Green Card	H-1B	
Bachelor's	30%		70%
Master's	30%	20%	50%
Doctor's	25%	45%	30%

- Graduates Who Would Have Remained in Absence of H-1B and Green Card Constraints

	2003	2004	2005	2006	2007	Total
Bachelor's*	9,529	10,024	10,227	10,287	10,119	50,187
Master's	25,658	27,045	25,943	25,237	23,753	127,634
Doctor's	2,274	2,583	2,949	3,386	3,667	14,860
						192,680

* Assumes half of non-adjusters do not seek adjustment.

- Graduates Who Would Have Remained to 2008 with Annual Emigration of 3.2%

	2003	2004	2005	2006	2007	Total
Bachelor's	(Considered above)					50,187
Master's	22,267	24,221	23,978	24,072	23,381	117,919
Doctor's	1,973	2,313	2,726	3,230	3,610	13,853
						181,959

- 2008 Potential Earnings

	Individual	Total
Income	$75,000	$13,647 million

- Federal Tax Receipts Forgone in 2008

a	Personal	FICA	Total
Tax liability	$9,000	$11,000	$3,639 million

Based on Tax Policy Center model in Leiserson 2006 (Table 1).

b	Household Earnings	Effective Tax Rate	Total
Tax liability	$84,500	17.3%	$2,660 million

Based on CBO 2007b (Table 1).

Table 2
H-1B Estimates

- Annual Expirations Minus Green Cards Available

Estimated		Green cards for high-skilled workers per year:	120,000
H-1B population:	500,000	Green cards accounting for new arrivals (15%)	
Annual expirations:	112,500	and dependents (55%):	45,900

Would-be H-1B adjusters constrained per year: 66,600

- H-1B Workers Who Would Have Remained to 2008 in Absence of Green Card Constraints

	2003	2004	2005	2006	2007	Total
Returnees	66,600	66,600	66,600	66,600	66,600	333,000
After emigration (3.2%)	57,798	59,648	61,557	63,526	65,559	308,089

Potential additional high-skilled workers in 2008 adjusted for emigration: 308,089

- 2008 Potential Earnings

	Individual	Total
Income	$75,000	$23,107 million

- 2008 Federal Tax Receipts

a	Personal	FICA	Total
Tax liability	$9,000	$11,000	$6,162 million

Based on TPC model in Leiserson 2006 (Table 1).

b	Household Earnings	Effective Tax Rate	Total
Tax liability	$84,500	17.3%	$4,504 million

Based on CBO 2007b (Table 4).

- Annual Expirations Minus Green Cards Available (as Range)

Would-be H-1B adjusters constrained per year — Low: 34,700 High: 120,300

- H-1B Workers Who Would Have Remained to 2008 in Absence of Green Card Constraints

	2003	2004	2005	2006	2007	Total
Low, adjusted	30,114	31,078	32,072	33,099	34,158	160,521
High, adjusted	104,402	107,742	111,190	114,748	118,420	556,503

After annual emigration of 3.2%

- 2008 Earnings and Federal Tax Receipts

	Individuals	Total Earnings	Total Tax Liability *a* (TPC)	*b* (CBO)
Low	160,521	$12,039	$3,210	$2,347
High	556,503	$41,738	$11,130	$8,135

Tax receipts estimated as above.

in millions

Table 3
Budget Effects of Increasing Employment-Based Green Card Caps

- Scenario IA: S. 2611, Comprehensive Immigration Reform Act of 2006

		Years After Passage										10-Year
		1	2	3	4	5	6	7	8	9	10	Total
Projected cumulative new entrants (in thousands)[i]		*	125	250	375	500	600	700	800	900	1,000	
Projected cumulative primary workers added (thousands)[ii]		*	56	112	169	225	270	315	360	405	450	
Earnings (in millions)		*	$4,219	$8,400	$12,638	$16,875	$20,250	$23,625	$27,000	$30,375	$33,750	$177,131
Federal revenues	*a*	*	$1,125	$2,240	$3,370	$4,500	$5,400	$6,300	$7,200	$8,100	$9,000	$47,235
(in millions)	*b*	*	$822	$1,637	$2,463	$3,289	$3,947	$4,605	$5,263	$5,920	$6,578	$34,525
Federal costs, direct spending (in millions)[iii]		*	*	*	*	*	*	$100	$100	$200	$300	$800
Net budget effects	*a*	*	$1,125	$2,240	$3,370	$4,500	$5,400	$6,200	$7,100	$7,900	$8,700	$46,435
(in millions)	*b*	*	$822	$1,637	$2,463	$3,289	$3,947	$4,505	$5,163	$5,720	$6,278	$33,725

See CBO 2006b.

[i] Sum of employment-based admissions and exclusion of certain immigrants from limits (Table 2).

[ii] Estimated 45 percent of individuals are primary workers, 55 percent are dependents.

[iii] Sum of employment-based admissions and exclusion of certain immigrants from admissions limit (Table 4).

a based on Leiserson 2006 (Table 1); *b* based on CBO 2007b (Table 1).

See also Congressional Research Service 2006.

Table 3, cont.
Budget Effects of Increasing Employment-Based Green Card Caps

- Scenario IB: S. 2611, Comprehensive Immigration Reform Act of 2006, Computer and Engineering Workers

		Years After Passage										10-Year
		1	2	3	4	5	6	7	8	9	10	[11]	Total
Cumulative new green cards (in thousands)		75	158	240	343	447	550	673	796	919	1042	[1165]	
Earnings (in millions)		$5,625	$11,813	$18,000	$25,750	$33,500	$41,250	$50,475	$59,700	$68,925	$78,150		$393,188
Federal revenues (in millions)	*a*	$1,500	$3,150	$4,800	$6,867	$8,933	$11,000	$13,460	$15,920	$18,380	$20,840		$104,850
	b	$1,096	$2,302	$3,508	$5,019	$6,530	$8,040	$9,838	$11,636	$13,434	$15,232		$76,637
Federal costs		-	-	-	-	-	-	-	-	-	-		-

See Lowell 2006.
a based on Leiserson, 2006 (Table 1); *b* based on CBO 2007b (Table 1).

Table 3, cont.
Budget Effects of Increasing Employment-Based Green Card Caps

- Scenario II: Senate Amendment 1150 to S. 1348, Comprehensive Immigration Reform Act of 2007

		Years After Passage										10-Year
		1	2	3	4	5	6	7	8	9	10	Total
Net change in US population, merit-based admissions (in thousands)		*	25	50	75	100	120	140	160	180	200	
Projected cumulative primary workers added (in thousands)[iv]		*	11	23	34	45	54	63	72	81	90	
Earnings (in millions)		*	$825	$1,725	$2,550	$3,375	$4,050	$4,725	$5,400	$6,075	$6,750	$35,475
Federal revenues	*a*	*	$220	$460	$680	$900	$1,080	$1,260	$1,440	$1,620	$1,800	$9,460
(in millions)	*b*	*	$161	$336	$497	$658	$789	$921	$1,053	$1,184	$1,316	$6,915
Federal costs, direct spending (in millions)[v]												$275
Visa fees (in millions)[v]												$15
Net budget effects	*a*											$9,200
(in millions)	*b*											$6,655

See CBO 2007a (Table 2).
[iv] Estimated 45 percent of individuals are primary workers, 55 percent are dependents.
a based on Leiserson, 2006 (Table 1); *b* based on CBO 2007b (Table 1).
[v] See CBO 2007a, pp. 21-22.

Table 4
Budget Effects of Increasing H-1B Caps

- Scenario I: S. 2611, Comprehensive Immigration Reform Act of 2006, Computer and Engineering Workers

		Years After Passage											10-Year
		1	2	3	4	5	6	7	8	9	10	[11]	Total
Projected cumulative new H-1B workers (in thousands)[i]		45	83	120	158	197	235	261	287	313	339	[365]	
Earnings (in millions)		$3,375	$6,188	$9,000	$11,875	$14,750	$17,625	$19,575	$21,525	$23,475	$25,425		$152,813
Federal revenues (in millions)	*a*	$900	$1,650	$2,400	$3,167	$3,933	$4,700	$5,220	$5,740	$6,260	$6,780		$40,750
	b	$658	$1,206	$1,754	$2,315	$2,875	$3,435	$3,815	$4,196	$4,576	$4,956		$29,785
Federal costs		-	-	-	-	-	-	-	-	-	-		-

[i] See Lowell 2006.

a based on Leiserson 2006 (Table 1); *b* based on CBO 2007b (Table 1). Same applies below.

Table 4, cont.
Budget Effects of Increasing H-1B Caps

- Scenario II: Senate Amendment 1150 to S. 1348, Comprehensive Immigration Reform Act of 2007

		Years After Passage										10-Year
		1	2	3	4	5	6	7	8	9	10	Total
Net change in US population H-1B visas (in thousands)[ii]		*	100	200	300	400	480	560	640	720	800	
Earnings (in millions)		*	$7,500	$15,000	$22,500	$30,000	$36,000	$42,000	$48,000	$54,000	$60,000	$315,000
Federal revenues	*a*	*	$2,000	$4,000	$6,000	$8,000	$9,600	$11,200	$12,800	$14,400	$16,000	$84,000
(in millions)	*b*	*	$1,462	$2,924	$4,386	$5,847	$7,017	$8,186	$9,356	$10,525	$11,695	$61,398
Federal costs		-	-	-	-	-	-	-	-	-	-	-
Visa fees (in millions) [iii]												$2,200
Net budget effects	*a*											$86,200
(in millions)	*b*											$63,598

[ii] See CBO 2007a (Table 2).
[iii] CBO 2007a, p. 26.

References

Borjas, George J. 2003. "The Labor Demand Curve *Is* Downward Sloping: Reexamining the Impact of Immigration on the Labor Market." *Quarterly Journal of Economics*, Vol. 18, No. 4, pp. 1335-1374.

———. 2005. *Wage Trends Among Disadvantaged Minorities*. NPC Working Paper No. 05-12. National Poverty Center, University of Michigan. August.

Bureau of Labor Statistics, U.S. Department of Labor (BLS). 2008. *Occupational Employment and Wages, 2007*. May 9.

Card, David. 1990. "The Impact of the Mariel Boatlift on the Miami Labor Market." *Industrial and Labor Relations Review*, Vol. 43, No. 2, pp. 245-257.

Congressional Budget Office (CBO). 2005. *The Role of Immigrants in the U.S. Labor Market*. November.

———. 2006a. *Cost Estimate S. 2611 Comprehensive Immigration Reform Act of 2006 as introduced on April 7, 2006*. May 16.

———. 2006b. *Cost Estimate S. 2611 Comprehensive Immigration Reform Act of 2006 as passed by the Senate on May 25, 2006*. August 18.

———. 2006c. "The Budgetary Impact of Current and Proposed Border Security and Immigration Policies." Statement by Paul R. Cullinan before the U.S. Senate Committee on the Budget. August 30.

———. 2007a. *Cost Estimate Senate Amendment 1150 to S. 1348, Comprehensive Immigration Reform Act of 2007 as amended by the Senate through May 24, 2007*. June 4.

———. 2007b. *Historical Effective Federal Tax Rates: 1979 to 2005*. December.

———. 2007c. *The Impact of Unauthorized Immigrants on the Budgets of State and Local Governments*. December.

———. 2009. *Cost Estimate H.R. 1 American Recovery and Reinvestment Act of 2009, an amendment in the nature of a substitute, as introduced by Senators Inouye and Baucus on January 31, 2009*. February 2.

Congressional Research Service. 2006. "Comparison of Selected Provisions on Permanent and Temporary Admissions in Title V of Senate-passed S. 2611, House-passed H.R. 4437, and Current Law" memorandum. August 29.

Greico, Elizabeth M. 2006. *Estimates of the Nonimmigrant Population in the United States: 2004*. Office of Immigration Statistics, U.S. Department of Homeland Security. June.

Hall, Robert E. 2004. "Measuring Factor Adjustment Costs." *Quarterly Journal of Economics*, Vol. 119, No. 3, pp. 899-927.

Hart, David M. 2006. “Global Flows of Talent: Benchmarking the United States.” Information Technology and Innovation Foundation. November 17.

Kerr, William R. and William F. Lincoln. 2008. “The Supply Side of Innovation: H-1B Visa Reforms and US Ethnic Invention.” Harvard Business School Working Paper 09-005. December.

Kirkegaard, Jacob Funk. 2007. *The Accelerating Decline in America’s High-Skilled Workforce: Implications for Immigration Policy*. Peterson Institute for International Economics. December.

Lee, R. and T. Miller. 2000. “Immigration, Social Security, and Broader Fiscal Impacts.” *American Economic Review,* Vol. 90 No. 2, pp. 350-354. May.

Leiserson, Greg. 2006. “Income Taxes and Tax Rates for Sample Families, 2006.” Urban-Brookings Tax Policy Center. December.

Lowell, B. Lindsay. 2000. “H-1B Temporary Workers: Estimating the Population.” Working paper 12. Center for Comparative Immigration Studies, University of California, San Diego. May.

———. 2006. “Projected Numbers of Foreign Computer and Engineering Workers Under the Senate’s Comprehensive Immigration Reform Act (S. 2611).” Institute for the Study of International Migration, Georgetown University. August.

———. 2007. “H-1B Visa Data: What Exists and What We Can Learn from It Regarding Scientists and Engineers.” Presentation at National Bureau of Economic Research workshop. November 7.

Lowell, B. Lindsay and Micah Bump. 2006. “Projecting Immigrant Visas: Report on an Experts Meeting.” Institute for the Study of International Migration, Georgetown University. October.

Mankiw, N. G. 2008. “What if the Candidates Pandered to Economists?” *New York Times*. July 13.

National Science Foundation. 2008. *Science and Engineering Indicators: 2008*. Division of Science Resources Statistics, National Science Foundation. January.

Office of Immigration Statistics, U.S. Department of Homeland Security (OIS). 2004. *Characteristics of Specialty Occupation Workers (H-1B): Fiscal Year 2003*. November.

———. 2006-2008. *Yearbook of Immigration Statistics.*

Ottaviano, G. and G. Peri. 2006. “Rethinking the Effects of Immigration on Wages.” NBER Working Paper 12497. August.

———. 2008. “Immigration and National Wages: Clarifying the Theory and the Empirics.” NBER Working Paper No. 14188. July.

Smith, James P. and Barry Edmonston, eds. 1997. *The New Americans: Economic, Demographic, and Fiscal Effects of Immigration*. Washington, DC: National Academy Press.

U.S. Immigration and Customs Enforcement (ICE). 2009. “STEM Designated Degree Programs (Effective date April 8, 2008; Updated September 25, 2008).” Available at http://www.ice.gov/sevis/stemlist.htm, accessed in February.

Wadhwa, Vivek, et al. 2007. “Intellectual Property, the Immigration Backlog, and a Reverse Brain-Drain: America’s New Immigrant Entrepreneurs, Part III.” Ewing Marion Kauffman Foundation. August.

———. 2009. “America’s Loss is the World’s Gain: America’s New Immigrant Entrepreneurs, Part IV.” Ewing Marion Kauffman Foundation. March.