Immigration and US Economic Competitiveness
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August 24, 2012

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Keywords: Immigration, migrant workers, competitiveness

Abstract
Most Americans are dis-satisfied with US immigration policies. This dissatisfaction stems from several factors, including the presence of over 11 million unauthorized foreigners and the fact that many US immigrants who want their spouses and children to join them face long waits. There is also a sense that the US, which accepts over a million immigrants and several hundred thousand temporary foreign workers a year, is not getting enough highly skilled immigrants and temporary workers who could bolster innovation and competitiveness in an increasingly knowledge-based economy. It is very hard to measure the benefits and costs of immigrants and migrant workers, which is one reason why the unsatisfactory status quo persists.

Introduction
The United States is a nation of immigrants. Almost all US residents are immigrants or their descendents, and most Americans celebrate their immigrant heritage. Immigrants have made and continue to remake America as they change the size and composition of the population, reshape the economy and labor market, and influence politics, society and culture. Immigration changes how US residents interact with each other, the food we eat, and our culture.

About 104,000 foreigners arrive in the United States every day, including 3,100 who receive immigrant visas that allow them to settle and become naturalized US citizens after five years. The foreigners arriving in the United States include almost 100,000 tourists, business visitors, foreign students and workers, persons whom the US Department of Homeland Security considers nonimmigrants or temporary visitors who will leave the US after a few days, weeks, or years. For
most of the past decade, some 2,000 unauthorized foreigners a day settled in the
United States. Over half eluded apprehension on the Mexico-US border, while
the others entered legally but violated the terms of their visitor visas by going to
work or not departing as their temporary visas required.1

The US had 40 million foreign-born residents in 2010, including 11.2 million, over
a quarter, who were illegally present. The US has more foreign-born residents
than any other country, three times more than number two Russia, which has 12
million international migrants. The US also has more unauthorized foreign
residents than any other country.

There are 30 rich or industrial countries, and they have an average 10 percent
foreign-born residents. However, there is wide variation. Foreigners are less than
two percent of residents in Japan and South Korea, but almost a quarter of the
residents Australia and New Zealand were born outside these countries. The US,
with 13 percent foreign-born residents, had a higher share of immigrants than
most European countries, but a lower share than Canada, where over 20 percent
of residents were born outside the country.

Two recent developments rekindled the US debate over how to change
immigration policy for the 21st century. The 2008-09 recession, the worst in 50
years, doubled the US unemployment rate to almost 10 percent and reduced the
entry of unauthorized foreigners. Most unauthorized foreigners in the US did not
go home even if they lost their jobs, since there were also few jobs in their home
countries. Legal immigration continued at over a million a year as US residents
sponsored family members for admission.2

The second stimulus for a renewed debate over immigration is the increasing
number of states, beginning with Arizona in April 2010, that enacted laws aimed
at pushing unauthorized foreigners out of the state. Arizona and other states

1 DHS reported a million immigrants and 46 million nonimmigrants in FY10, excluding
over 100,000 Canadians and Mexicans who entered the US for a day or two. There were
517,000 apprehensions of unauthorized foreigners in FY10, mostly Mexicans detected
along the Mexico-US border. The US has been deporting or removing almost 400,000
foreigners a year, including 387,000 in FY10.
2 The 2008-09 recession resulted in the loss of eight million jobs; civilian employment fell
from 146 million at the end of 2007 to 138 million at the end of 2009. Job growth resumed
in 2010 (http://data.bls.gov/cgi-bin/surveymost?bls). There was also stepped-up
enforcement of immigration laws, especially after the failure of the US Senate to approve
a comprehensive immigration reform bill in 2007, including a proposal to require
employers to fire employees whose names and social security data do not match
(http://migration.ucdavis.edu/mn/more.php?id=3315_0_2_0).
There is agreement that the stock of unauthorized foreigners fell in 2008-09 for the first
time in two decades, but disagreement over why it fell. Some studies stress the US
recession, suggesting that the stock of unauthorized foreigners will increase with
economic recovery and job growth. Others stress the effects of federal and state
enforcement efforts to keep unauthorized workers out of US jobs. For a review of the
debate, see http://migration.ucdavis.edu/mn/more.php?id=3433_0_2_
require all employers to use E-Verify to check the legal status of newly hired workers, which encourages some unauthorized workers to move to other states and seek jobs with employers who do not use E-Verify (California and Illinois have state laws that restrict the ability of local governments to require employers to use E-Verify). Alabama, Arizona, and other states also require state and local police to determine the status of persons they encounter or arrest. The US Supreme Court has upheld the authority of states to require their employers to use E-Verify and to have police check suspected unauthorized foreigners.

**Immigration**

Between 1990 and 2010, the number of foreign-born US residents doubled from 20 million to 40 million. The US population increased from 250 million to 310 million, so that immigration contributed a third to US population growth and, with the US-born children and grandchildren of immigrants, migration accounted for over half of US population growth.

Legal immigration has been increasing. Immigration averaged 250,000 a year in the 1950s, 365,000 a year in the 1960s, 443,000 a year in the 1970s, 640,000 a year in the 1980s, almost a million a year in the 1990s, and 1.1 million a year in the first decade of the 21st century. The number of foreign-born US residents is higher than ever, but the 13 percent foreign-born share of the population is below the 15 percent share a century ago, when a million immigrants a year arrived in a country of 92 million in 1910, versus 309 million in 2010.

**Figure 1. Immigration to the US: 1850-2010**
Until the 1960s, most immigrants were from Europe. During the 1950s, for example, over 55 percent of the immigrants arriving in the US were from Europe, including almost half from Germany and Austria. Since the shift in policy from national origins to family unification in 1965, most immigrants have been from Mexico, other Latin American countries, and Asia. For example, between 2000 and 2009, almost 20 percent of the 10 million immigrants were from Mexico, 25 percent were from other Latin American countries, and 35 percent were from Asia.

Immigration is sometimes likened to entering a house, with a front door for legal permanent immigrants, a side door for legal temporary visitors, and a back door for the unauthorized. Each door has subcategories of entrants. For example, there are four major types of front-door immigrants, family-sponsored, employment, refugees, and those who win immigration visas in a lottery.

Two thirds of front-door immigrants receive immigration visas because their family members petition the US government to admit their relatives. Some of these US relatives are US citizens who request immigration visas for their immediate family members, spouses, children under 21, and parents. There are no quotas or limits on the number of immigrant visas available for immediate relatives of US citizens, and in recent years almost 500,000 immigrant visas a year were issued to spouses, parents, and children of US citizens. In many cases, the US citizens petitioning for the entry of relatives are immigrants who have naturalized.

Table 1. Foreigners coming to or in the US, FY06-10

<table>
<thead>
<tr>
<th>Category</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal Immigrants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate relatives of US citizens</td>
<td>1,266,129</td>
<td>1,052,415</td>
<td>1,107,126</td>
<td>1,130,818</td>
<td>1,042,62</td>
</tr>
<tr>
<td>Other family-sponsored immigrants</td>
<td>580,348</td>
<td>494,920</td>
<td>488,483</td>
<td>535,554</td>
<td>476,41</td>
</tr>
<tr>
<td>Employment-based</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refuges and Asylees</td>
<td>222,229</td>
<td>194,900</td>
<td>227,761</td>
<td>211,859</td>
<td>214,58</td>
</tr>
<tr>
<td>Diversity and other immigrants</td>
<td>159,081</td>
<td>162,176</td>
<td>166,511</td>
<td>144,034</td>
<td>148,34</td>
</tr>
<tr>
<td>Estimated Emigration</td>
<td>316,000</td>
<td>320,000</td>
<td>324,000</td>
<td>328,000</td>
<td>328,000</td>
</tr>
<tr>
<td><strong>Temporary Visitors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pleasure /Business</td>
<td>33,667,328</td>
<td>37,149,651</td>
<td>39,381,925</td>
<td>36,231,554</td>
<td>46,471,52</td>
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<tr>
<td>Foreign Students (F-1)</td>
<td>29,928,567</td>
<td>32,905,061</td>
<td>35,045,836</td>
<td>32,190,915</td>
<td>40,337,29</td>
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<tr>
<td>Temporary Foreign Workers</td>
<td>693,805</td>
<td>787,756</td>
<td>859,169</td>
<td>895,392</td>
<td>1,514,78</td>
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<tr>
<td><strong>Illegal Immigration:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Apprehensions</strong></td>
<td>985,456</td>
<td>1,118,138</td>
<td>1,101,938</td>
<td>936,272</td>
<td>1,682,13</td>
</tr>
<tr>
<td><strong>Removals or Deportations</strong></td>
<td>1,206,457</td>
<td>960,756</td>
<td>791,568</td>
<td>613,003</td>
<td>516,99</td>
</tr>
<tr>
<td><strong>Unauthorized Foreigners</strong></td>
<td>280,974</td>
<td>319,382</td>
<td>358,886</td>
<td>395,165</td>
<td>387,24</td>
</tr>
</tbody>
</table>

Sources: DHS Immigration Statistics, www.dhs.gov/immigrationstatistics
Unauthorized Foreigners from Passel
Beginning in FY10, DHS made a more complete count of land admissions

There are limits or quotas on immigrant visas available for more distant relatives of US citizens and the family members of legal immigrants settled in the US. There are more such relatives than visas, leading to sometimes lengthy queues. For example, the unmarried adult sons and daughters of US citizens have to wait an average seven years for immigrant visas, while the spouses and children of immigrants wait almost three years.

There are several ways to look at the queues for relatives trying to obtain immigrant visas. On the one hand, most countries do not give immigrant visas to adult sons and daughters or adult brothers and sisters of US citizens, that is, the US has a more expansive family unification system than most other countries. On the other hand, many relatives do not wait abroad for immigrant visas. Instead, they enter the US as temporary visitors and stay or slip into the US illegally, so that a million or more of the unauthorized foreigners in the US are likely to eventually qualify for immigrant visas even without a large-scale legalization program.

A second and much smaller number of immigrant visas are available to foreigners requested or sponsored by US employers. There are 140,000 employment-based visas a year available for foreigners and their families requested by US employers. There are several types of employment-based immigrant visas, but the largest number is for foreigners whose employers demonstrate to the US Department of Labor that US workers are not available to fill a job. Almost all of the foreigners who are sponsored by employers for immigrant visas are already in the US, over 90 percent in recent years, and many already fill the job for which the employer says there are no qualified US workers. Another employment-based immigrant visa is available to foreigners who invest at least $500,000 in the US and create or preserve at least 10 jobs.

The third group of front-door immigrants are refugees and asylees. Refugees are foreigners outside their country of citizenship who do not wish to return because of, according to the UN Refugee Convention of 1951, “a well-founded fear of persecution due to race, religion, nationality, membership in a particular social

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3 The number of employment issued can be higher than 140,000 because employment visas not issued in earlier years can be carried forward.

4 There are five types of employment-based immigration visas: (1) priority workers with "extraordinary ability" in the arts or sciences or multinational executives; (2) members of the professions holding advanced degrees; (3) professionals with Bachelor's degrees and skilled and unskilled workers; (4) special immigrants, including ministers; and (5) investors.

5 EB-5 investor visas are available to those in invest at least $1 million and create or preserve at least 10 full-time US jobs, $500,000 in areas with unemployment rates that are 1.5 times the US average. Most foreign investors invest $500,000 via US firms that recruit foreign investors, the foreigners generally do not actively manage their US investments. After two years and a check on the investment and jobs, foreign investors can convert probationary immigrant visas into regular immigrant visas.
group, or political opinion.” Until 1980, the US did not follow UN refugee definition of refugee, instead considering all persons who did not want to return to communist countries and Southeast Asians displaced by the Vietnam war to be refugees. The US government continues to make an exception for Cubans, who can stay in the US as refugees under a 1966 law if they reach “dry land” before being intercepted by US authorities.6

The fourth front-door channel is for “diversity immigrants,” a category created in 1990 to offset the decline in migration from Ireland and other European countries who found it hard to obtain immigrant visas because they had few close relatives in the US to sponsor them. The Immigration Act of 1990 made 50,000 diversity visas available each year, and all were reserved initially for the Irish. Today, diversity visas are available to citizens of countries that sent fewer than 50,000 immigrants to the US during the previous five years. Foreigners enter via the internet in October, and the winners of immigrant visa are drawn by lottery the following spring. In 2010, over half of the 15 million entries were made by Bangladeshis.7

Once they reach the United States, most immigrants stay, but immigration is always accompanied by at least some emigration. Between 1901 and 1990, the number of people leaving or emigrating from the United States was equivalent to almost a third of the number immigrating and, during the 1930s, more people left the United States, 650,000, than arrived, 530,000. In making population projections, the US Census Bureau assumed that about 300,000 US residents would emigrate each year, equivalent to 30 percent of projected net immigration (Hollmann, et al, 2000). DHS, using a different methodology and focusing only on foreign-born US residents, estimated that an average 118,000 foreign-born US residents left each year between 1980 and 2008 (Hoefer et al 2009).

**Temporary Visitors**

US businesses are eager to attract most types of side-door temporary visitors or nonimmigrants, as evidenced by airline and hotel ads for foreign tourists. Arrivals of temporary visitors increased in the 1990s, but fell after the September 11, 2001 terrorist attacks for reasons that included new rules for issuing visas, including a requirement that most foreigners who require visas to come to the US appear in-

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6 Under a 1995 agreement with Cuba aimed at stemming the outflow of boat people, the US Coast Guard returns Cubans intercepted at sea to Cuba. This “wet-foot, dry-foot” policy for Cuba has been criticized by advocates for Haitians, who are often returned to Haiti even if they reach Florida.

7 In FY10, over half of the 15 million applicants were Bangladeshis (8.6 million applied), followed by two million Nigerians; 1.1 million Ukrainians; and almost 800,000 Ethiopians and another 800,000 Egyptians. In FY11, only eight million foreigners applied for diversity immigrant visas, perhaps because Bangladesh was for the first time excluded. Nigerians submitted 1.4 million entries in FY11, Ghanaians 910,000, and Ukrainians 850,000.
person at US embassies and consulates to be interviewed. Temporary visitor arrivals have since rebounded, and today approach 50 million a year.

Some of the recent increase in the temporary visitor admissions reported by DHS reflect a more complete count of foreigners who arrive from Canada and Mexico. If an individual enters the US several times, she is counted each time in DHS admissions data. Beginning in 2010, DHS separated unique individuals and admissions, and reported that 25 million unique individuals were admitted, meaning there were almost two “admissions” for each unique individual.

Several categories of side-door temporary visitors are of special interest. For example, foreign student admissions have increased sharply, reflecting the global reputation of US higher education, affluence in Asia that enables more Chinese, Indians, and Koreans to seek US degrees, and active recruitment of fee-paying foreign students by some US universities. About 215,000 foreign students arrived in the US in 2010-11, when a total of 725,000 were enrolled at US universities. About 35 percent of the foreign students are from China and India, and the University of Southern California has more foreign students, more than 10 percent of the total, than any other US university (Open Doors).

Foreign students became controversial after September 11, 2001 because some of the attackers had student visas but did not enroll at the institutions that admitted them. In response, the US government developed a new database, the Student and Exchange Visitor Information System, to track foreign students at colleges and universities (www.ice.gov/sevis/index.htm). Foreign students pay a fee to cover the cost of SEVIS.

Many foreign students graduate from US universities and stay, which they can most easily do by marrying a US citizen or finding a US employer to sponsor them for an immigrant visa. Most US employers are not willing to sponsor fresh graduates for immigrant visas. Instead, employers often try to hire fresh graduates as interns or guest workers. All foreign graduates of US universities can stay in the US a year after graduation for what is called Optional Practical Training (OPT), usually a paid internship. If their degree is in a science, technology, engineering, or mathematics (STEM) field, foreign graduates of US universities may stay in the US an additional 17 months, giving their employers

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8 The US Visa Waiver Program in 2012 allowed the citizens of 36 countries to visit the United States for up to 90 days without a visa.
9 The ratio between admissions and unique individuals varies by type of temporary visitor. For example, admissions and unique individuals were about 140,000 a year for H-2A and H-2B workers until 2005, when admissions increased sharply before falling slightly in 2009-10. One reason for the spike in admissions may be because employers of H-2A workers in Arizona for the winter vegetable harvest provide housing in Yuma and other border cities, but some H-2A visa holders prefer to live in Mexico and commute daily to US jobs. Counting each daily admission of such workers ensures that admissions are significantly higher than unique individuals. (www.dhs.gov/files/statistics/publications/impact-changes-nonimmigrant-admissions.shtm)
more time to determine if they should be sponsored for a guest worker or immigrant visa.

Foreign student graduates of US universities may become guest workers. The H-1B visa makes it easy for US employers to hire foreigners with at least a college degree to fill US jobs that normally require a college degree. The H-1B visa was created in 1990 to deal with perceived labor market mis-matches, that is, Congress believed that the US had enough workers, as indicated by a higher-than-normal unemployment rate, but not enough with computer skills to fill the growing number of jobs in the then nascent IT-sector. The compromise embodied in the H-1B program makes it very easy for employers to gain approval to hire foreign guest workers, but caps the number of visas available at 65,000 a year, plus 20,000 visas a year for foreigners with advanced degrees from US universities, and an unlimited number for non-profit universities and research centers.

Most employers only need to attest or sign a document in which they promise to pay the prevailing wage in order to receive permission to hire foreigners with H-1B visas; most can legally lay off US workers and replace them with H-1B workers. Congress thought that easy access to foreign H-1B workers would jumpstart computer-related businesses, and expected the number of employer requests to start high and then fall as more Americans earned degrees in science and engineering. But employer requests for H-1B visas did not start high and fall. Instead, the annual quota on H-1B visas, which at 65,000 a year was three times admissions of foreign professionals in the late 1980s, was not reached until 1997. With all H-1B visas requested, employers who had become accustomed to hiring Indian IT workers persuaded Congress to raise the cap, eventually to 195,000 a year.

The evolution of the H-1B program illustrates the path dependency that can occur in agriculture, IT, and other sectors. Once employers become accustomed to hiring workers from a particular country, the supervision and training system changes to make it ever easier to employ more, and the demand for Mexican farm workers or Indian IT workers rises. In the case of H-1B visas, few anticipated the emergence of Indian outsourcing firms such as Wipro whose business model was to use H-1B visas to bring Indian workers into the US and send them from one US firm to another. Instead of employer requests for H-1B visas rising and then falling, outsourcers requested ever more visas, and they and firms such as Microsoft and Intel combined forces to raise the cap.

Today, there is an H-1B policy stalemate. Employers want Congress to raise the cap, but critics have blocked more H-1B visas until the law is changed to require all employers to first try to recruit US workers before requesting permission to hire foreigners with H-1B visas. They also want US employers to certify that they did not lay off US workers to open jobs for foreign H-1B visa holders.10

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10 The H-1B program remains controversial. On January 30, 2012, Jennifer Wedel complained to President Obama that her husband, an engineer laid off by Texas Instruments, could not find a job. Obama responded that the US was short of such engineers, and asked for Darin Wedel’s resume. After an initial flurry of calls to Wedel,
Unauthorized Foreigners
Unauthorized, undocumented, or illegal foreigners are persons in the US in violation of US immigration laws. The best estimate is that their number rose by over 500,000 a year, from about 3.5 million in 1992 to 12 million in 2008, before falling to 11.2 million in 2012.

The Department of Homeland Security (DHS) has two agencies responsible for dealing with unauthorized migration. The Customs and Border Protection (CBP) agency includes the Border Patrol and customs inspectors who aim to prevent unauthorized foreigners from entering the United States, while the Immigration and Customs Enforcement (ICE) agency seeks to identify and remove unauthorized foreigners inside the United States. CBP agents today are apprehending less than 1,000 foreigners a day just inside US borders, down from over 4,000 a day in 2000. It should be emphasized that Border Patrol apprehensions record the event of capturing an unauthorized foreigner rather than a count of unique individuals, so that one foreigner apprehended five times is recorded as five apprehensions.

Most Mexicans apprehended just inside the United States are fingerprinted and allowed to return “voluntarily” to Mexico rather than being formally removed or deported. The distinction between voluntary return and formal removal is important, since foreigners who return to the United States after formally being removed can be imprisoned. CBP is trying to discourage repeated attempts to slip into the United States from Mexico with a Consequence Delivery System introduced in 2012 that punishes all unauthorized entrants. For example, Mexicans apprehended in Arizona may be returned to Mexico in Texas, where they have few contacts, a policy aimed at encouraging them to return to their homes rather than to try to re-enter the United States. Those apprehended five or more times may be prosecuted and imprisoned.

Foreigners who are "other than Mexicans" (OTMs) are normally detained before being brought before an immigration judge to be formally removed or deported. In the past, OTMs were often released until their court dates because there was not enough space to detain them, and most did not appear when their case was scheduled in immigration court. This “catch-and-release” policy was changed to a “catch-and-detain” policy, so that DHS regularly detains 34,000 foreigners awaiting removal hearings.

ICE agents seek unauthorized foreigners in the United States, especially those who have committed crimes in the United States and enforce laws that prohibit unauthorized foreigners from working in the US. ICE agents target foreigners convicted of US crimes, but most of the foreigners who are detected and deported are not convicted US criminals. The reason is that, as ICE agents search for foreigners convicted of US crimes, they also apprehend other unauthorized

recruiters said that since he was limited to the Dallas area by a child-custody agreement, they could not help him to get a job. Wedel blames the H-1B program for making younger and less expensive foreign engineers readily available to US employers.
foreigners, such as relatives of the criminals they are seeking. In recent years, about half of the almost 400,000 foreigners a year who were deported were convicted of US crimes, and almost three-fourths were Mexicans.  

ICE agents also enforce the employer sanctions laws that fine on employers who knowingly hire unauthorized workers. To prevent unauthorized workers from getting jobs, newly hired workers must present documents to their employers that prove their identity and right to work in the US, and both workers and employers sign a so-called I-9 form to demonstrate that they completed this procedure. Employers do not have to determine the authenticity of the documents that workers present, and many workers present false documents or documents belonging to other workers. DHS operates the E-Verify that allows employers to check worker-presented documents, but employer participation in E-Verify is voluntary for most employers, although bills pending in Congress would require all employers to participate in E-Verify.

Workplace enforcement has been a relatively low priority for immigration enforcement since employer sanctions were enacted in 1986. However, President George W. Bush ordered more workplace raids after the Senate failed to approve comprehensive immigration reforms in 2007. President Obama halted workplace raids in 2009, and ICE agents now try to keep unauthorized workers out of jobs by auditing or checking I-9 forms. ICE audits the I-9 forms of employers and advises them which employees appear to be unauthorized. Employers, in turn, inform employees and ask them to clear up the discrepancies noted by ICE in their records. Most suspect employees quit and, since they are not removed from the US, some switch to other employers.

Immigration and Competitiveness
Most immigrants come to the United States for economic opportunity. About half of US residents are in the US labor force, and a sixth of US workers were born abroad. US-born residents 25 and older, when arrayed by the best single predictor of earnings, years of schooling, form a diamond shape to reflect the fact that about 60 percent have completed secondary school but not college, 10 percent did not complete high school, and 30 percent have college degrees or more. Foreign-born adults have more of a barbell shape, since over 30 percent did not complete high school and over 30 percent completed college. What is unusual about foreign-born workers is that most of those who did not complete high school did not finish ninth grade, while many of those with college degrees also have Master’s or PhDs.

11 Immigration and Customs Enforcement Director John Morton testified October 12, 2011 that ICE deported 396,906 foreigners in FY10, including 55 percent convicted of US crimes. Morton put the average cost of deporting a foreigner at $23,000. About 72 percent of those removed in FY10 were Mexicans, followed by almost 20 percent from Guatemala, Honduras and El Salvador.

12 In Fall 2011, all federal contractors and 18 states required some or all of their employers to participate in E-Verify. The US Supreme Court in May 2011 upheld Arizona’s Legal Arizona Workers Act that required employers in that state to participate.
Macroeconomic Effects
Immigration adds to the population and the labor force. The standard static or short-run analysis of the economic impacts of migrant on resident workers assumes that adding foreign workers to the labor force shifts the aggregate labor supply curve to the right along a fixed labor demand curve, increasing employment and lowering wages in a larger economy. The US President’s Council on Economic Advisors summarized the effects of immigration as follows (1986, 213-4):

"Although immigrant workers increase output, their addition to the supply of labor . . . [causes] wage rates in the immediately affected market [to be] bid down. . . Thus, native-born workers who compete with immigrants for jobs may experience reduced earnings or reduced employment."

Figure 2, adapted from a National Research Council study (Smith and Edmonston, 1997), summarizes this wage-depressing effect of immigration. In 1996, the US had about 140 million workers earning an average $12.60 an hour at F, including 15 million foreign-born workers. The NRC consensus was that these foreign-born workers reduced average hourly earnings in the US labor market by 3 percent, to about $12.60 an hour, that is, eliminating foreign-born workers would have resulted in 125 million US workers earning $13 an hour at E.

Figure 2. The Effects of Immigration
The shift from E to F as a result of immigration creates two rectangles and a triangle:

- rectangle C is a transfer between natives, as lower wages mean higher returns to owners of capital and land
- the economy expands by rectangle D and triangle B. Immigrants get most of the benefits of this economic expansion as wages in D, but owners of capital gain triangle B as well as the economy grows.

The major economic beneficiaries of immigration are migrants who earn higher wages, gaining D, and employers who pay lower wages, gaining B and C. The major losers are workers employed before the arrival of immigrants lowered wages. This static analysis suggests that immigrant workers expand the economy by lowering wages and increasing the returns to capital.

The size of triangle B, the net increase in national income (in percent) due to immigration, can be estimated by using the formula for the area of a triangle, viz, 

\[ \frac{1}{2} \times (3\% \text{ decrease in US wages due to immigration} \times 11\% \text{ immigrant share of US labor force} \times 70\% \text{ share of labor in US national income}) \times \frac{1}{2} \times 0.002 = 0.001, \]

that is, US national income increased 1/10 of 1 percent due to immigration. US GDP was $8 trillion in 1996, making the net benefit B equal to $8 billion a year. Since economic growth was 3.7 percent or $292 billion in 1996, the net contribution of immigration to the US economy was equivalent to 10 days economic growth.

The NRC estimate that immigration generated net economic benefits of $8 billion yielded two opposite reactions. Admissionists trumpeted the $8 billion net gain, while restrictionists emphasized how small the net gain from immigration was in the large US economy. The fact that immigration’s net economic effects were the equivalent of less than two weeks economic growth explains why many economists assert that the major economic issues associated with immigration are distributional. Borjas (1995, p9) concluded: “If the social welfare function depends on both efficiency gains and the distributional impact of immigration, the slight benefits arising from the immigration surplus may well be outweighed by the substantial wealth redistribution that takes place, particularly since the

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13 The underlying NRC model assumed constant returns to scale in a two-factor production function with homogeneous labor and full employment, meaning that immigration did not change long-run returns to capital and labor. Wage depression due to immigration lasts for about a decade IF immigrants arrive in one period and then immigration stops. If labor is heterogeneous, the arrival of immigrants has long-run distributional consequences, helping complementary workers and hurting those who are substitutes.

14 Nominal GDP was $7.9 trillion in 1996, when nominal growth was 3.7 percent. Tables B-1 and B-4 of the Economic Report of the President.
redistribution goes from workers to owners of capital (or other users of immigrant services).”

Assumptions about the nature of the aggregate production function, the extent of wage depression, and other variables can change the estimated economic benefits of immigration. However, the overall conclusion is unchanged, viz, adding immigrants to the labor force expands GDP by slightly lowering wages and increasing returns to capital, with most of the increase in national income accruing to immigrants.

Most international migrants cross borders in search of economic betterment, which most find in the labor market of the destination country. The question is what impact migrants have on resident workers? As we have seen, macroeconomic studies suggest that immigration reduces the wages of resident workers slightly, prompting debates about how much.

**Labor Market Effects**

Most international migrants cross borders in search of economic betterment, which most find in the labor market of the destination country. The question is what impact migrants have on resident workers? Macroeconomic studies suggest that immigration reduces the wages of resident workers slightly, prompting debates about how much.

Case studies document the sometimes dramatic impacts of immigrants on particular industries and occupations. When unionized citrus workers employed by grower-formed labor cooperatives in southern California went on strike for a wage increase in 1982, many growers turned to labor contractors who hired unauthorized workers to get their lemons and oranges harvested. After the strike was settled, the six unionized harvesting coops lost business, as some of their grower-members quit and continued to rely on labor contractors. The costs of unionized coops increased as they spread their fixed costs over a smaller volume of business, and eventually they went out of business. In this case, an industry that was mostly unionized and employing US citizens and legal immigrants in 1978 was mostly non-union and dominated by unauthorized workers six years later. The wages and especially the benefits of workers declined as 27 labor contractors replaced six coops (Mines and Martin, 1984, GAO, 1988, pp37-8).

Case studies in low-wage industries such as agriculture and construction show that immigrants can displace workers and depress wages, confirming accepted labor market theory. However, as the citrus example shows, the effects of migrant workers can be indirect and hard to measure. The older and unionized coop workers were displaced in a competition between two types of employers, coops versus labor contractors, that was won by the contractors. There were no studies of the older US workers who had been employed by the coops, so their fate is not known. There were also few complaints about contractors hiring unauthorized workers.

Case studies are often cited by policy makers because the composition of the workforce in a particular industry changes in a visible way. For example, the
GAO documented the change from unionized janitorial service firms in Los Angeles hiring Blacks represented by the Service Employees International Union (SEIU) in the early 1980s to most office buildings switching to smaller non-union cleaning contractors who hired unauthorized Hispanics five years later (GAO, 1988, p39-41). Janitorial wages fell from above minimum to the minimum wage, health insurance and other benefits disappeared, and GAO concluded that janitorial services shows that “illegal aliens may displace native workers.” (GAO, 1986).

There were no studies of the Black janitors who were replaced by immigrants, and there were few complaints about janitorial service firms employing unauthorized workers. The SEIU’s Justice for Janitors campaign was able to organize some of the replacement janitors in the 1990s by targeting building managers. Instead of a master contract with uniform wages and benefits in each city, the SEIU began to adjust wages and benefits to particular sections of cities (Erikson et al, 2002).

Two aspects of case studies are very important: network hiring and the fate of resident workers. Farm work, janitorial services, and food preparation are occupations that typically have high worker turnover, making the search for new workers to replace those who quit a challenge for management. Immigrant networks can reduce this management challenge by making it less necessary to invest in the recruitment and training of new workers. Current workers can bring friends and relatives into the workplace, and they tend to refer only those who can perform the job and often take responsibility for training new workers. Immigrant networks thus “take over” the recruitment and training new workers. For this reason, friends and relatives of current workers who are outside the country may learn about job vacancies before jobless native workers living nearby (Waldinger and Lichter, 2003).

The second aspect of case studies involves workers who are replaced by migrants or do not learn about vacant jobs. Many “immigrant jobs” offer low wages for hard work at “unsocial” hours and have other attributes that do not make them the first choice of resident workers. The question is whether the availability of migrants “pushes natives up” the job ladder or leaves them jobless and out of the labor force.

15 In one non-union janitorial firm, 94 percent of workers were unauthorized. The number of Black unionized janitors fell from 2,500 in 1977 to 600 in 1985 (GAO, 1988, p40). GAO noted that “illegal alien workers… exerted downward pressure on wages and working conditions within low-wage, unskilled jobs in the agricultural, food processing, and janitorial sectors [while] stimulating business and expanded employment opportunities for legal and native workers in other sectors, including the garment industry.”

16 Migrant workers from lower wage countries can also be relatively more skilled than the local workers they replace, since their frame of reference is the lower wages that prevail at home (Piore, 1980). It has been widely reported that the so-called A8 migrants from Central European countries working in the UK had higher levels of education than the British workers employed in farming and similar occupations alongside them.
The data are hard to interpret. Some argue that an influx of low-skilled migrants who are preferred by employers because of their “good attitudes” encourages or forces low wage resident workers to obtain additional skills and move up the job ladder. Others argue that the falling labor force participation rate of Black men, and their rising incarceration rate, are due in part to the arrival of low-skilled immigrants.17

Spatial-correlation econometric studies examine wages and unemployment rates across cities with different shares of immigrant workers in their labor forces. These studies assume that the wages and unemployment rates of workers similar to migrants, such as US-born Blacks, Hispanics, and women, will be affected as the share of low-skilled migrants in city work forces increases.

Comparisons of the wages and unemployment rates of low-skilled US workers in cities with more and fewer low-skilled immigrants rarely find lower wages and higher unemployment rates for resident workers in cities with more immigrants. Indeed, despite the Mariel boat lift that brought 125,000 Cubans to the US, including half who settled in Miami and increased the city’s labor force by seven percent in summer 1980,18 the unemployment rate of Blacks was lower in Miami in 1981 than in cities such as Atlanta that did not receive Cuban immigrants (Card, 1990).19 Wage rates for Blacks and other low-skill workers expected to compete with newly arrived Cubans were also unchanged, leading Card to conclude that Miami-area businesses expanded their employment with labor-intensive techniques to create jobs for the newly arrived Marielitos.

Card (2001) followed up with another study that examined the share of migrants in particular occupations in 1990 (rather than simply the share of migrants in a city’s labor force). He found that the average hourly earnings of US-born workers in the 175 largest US cities were lowered by migrants more in some occupations than others, but the effect was small, and found little evidence that US-born residents moved away from “immigrant cities.” (2001).

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17 About 20 percent of US-born Black men without high-school diplomas are imprisoned. “Using data drawn from the 1960-2000 U.S. Censuses, we find a strong correlation between immigration, black wages, black employment rates, and black incarceration rates. As immigrants disproportionately increased the supply of workers in a particular skill group, the wage of black workers in that group fell, the employment rate declined, and the incarceration rate rose. Our analysis suggests that a 10-percent immigrant-induced increase in the supply of a particular skill group reduced the black wage by 3.6 percent, lowered the employment rate of black men by 2.4 percentage points, and increased the incarceration rate of blacks by almost a full percentage point.” (Borjas, Grogger, and Hanson, 2006).

18 US-bound migrants had to leave Cuba via the port of Mariel.

19 The unemployment rate of blacks in Miami in 1979 was 8.3 percent and rose to 9.6 percent in 1981. However, in the four comparison cities of Atlanta, Houston, Los Angeles and Tampa-St Petersburg that did not receive Cuban migrants, the unemployment rate of blacks rose from 10.3 percent in 1979 to 12.6 percent in 1981.
After reviewing the other spatial-correlation studies of Card and others,\textsuperscript{20} Friedberg and Hunt concluded: “Despite the popular belief that immigrants have a large adverse impact on the wages and employment opportunities of the native-born population, the literature on this question does not provide much support for this conclusion” (1995, p. 42). However, Borjas (1994, 1700) warned that economists “still do not fully understand how immigrants affect the employment opportunities of natives in local labor markets; nor do we understand the dynamic processes through which natives respond to these supply shocks and reestablish labor market equilibrium.” For example, despite Card’s failure to find changes in internal migration in response to the arrival of immigrant workers in a city, if resident workers who compete with immigrants move away from cities with more immigrants, or do not move to such cities, internal migration can make spatial correlations across cities with more and fewer migrants that find few effects spurious.\textsuperscript{21}

The major alternative to spatial-correlation studies are skill-cell or age-education cell econometric studies that estimate the impact of migrants on resident workers within a cell, such as 25-30 year olds with less than secondary school education. Borjas (2003) grouped US and immigrant workers into four education and eight work-experience cells, viz, less than high school, high school graduates, some college, and college graduates, and measured work experience in five-year increments, grouping workers who were 25 to 30, 35 to 40 etc. Borjas made two important assumptions: there was little mobility between the 32 cells, and migrants and US workers are substitutes within each cell.

Using census data for 18-64 year old men between 1960 and 2000, Borjas estimated a labor demand elasticity of -0.3, suggesting that a 10 percent increase in the supply of labor in a particular education and age cell reduced wages by three percent. There was more wage depression at the extremes of the education distribution, for those who did not finish high school (resident worker wages down eight percent) and those with college degrees (down five percent). Borjas found that the adverse effect of migrants on resident workers was smaller if the model was estimated by state rather than nationally, suggesting that internal migration biased the estimates in spatial correlation studies downward.

Ottaviano and Peri (2005) grouped US and immigrant workers into the same four education and eight work-experience cells as Borjas, but they assumed that migrant and US-born workers within each cell were complements, that is, 25 to 30 year old immigrants with less than a high-school education fill different jobs

\textsuperscript{20} Many spatial-correlation studies try to deal with potential biases in their regressions that reflect migrants moving to high-wage and low-unemployment areas and moving to areas with migrants from their country of origin by first-difference models that regress changes in labor market outcomes against changes in the share of immigrants and instrumental variables to deal with migrant stocks, under the theory that migrant stocks are not correlated with current labor market conditions.\textsuperscript{21} Immigrants may also be attracted to cities with low unemployment and fast job growth, which could result in spurious positive correlations between the share of immigrants in the city labor forces and unemployment rates.
than similar US-born workers in that age and experience cell. The immigrant workers can complement US-born workers within a cell, as when a 30-year old US-born carpenter with a high-school education is more productive because he has a foreign-born helper. Ottaviano and Peri also assumed that there could be an investment response to the arrival of migrants that increases the demand for labor, as when the arrival immigrants creates construction jobs to build additional housing.

These assumptions changed the results, so that the arrival of migrants increased the wages of US-born workers. For example, between 1990 and 2000, there was an eight-percent increase in the number of foreign-born workers, and Ottaviano and Peri estimated that the wages of all US-born workers rose by two percent as a result of this immigration (wages for the lowest education group declined by two percent, but rose for the other three education groups). By assuming that migrants and US-born workers are complements, and by allowing investment to respond to the additional workers supplied by immigration and create additional jobs, Ottaviano and Peri find more positive than negative effects of migrants on US-born workers.

The fact that economists must make assumptions about how migrant and resident workers interact, and about how investors and businesses respond to the arrival of migrants, means that the results of econometric studies depend on the assumptions about migrant-resident worker interactions. One summary of econometric studies of over the past three decades concluded that, because “immigration triggers a variety of dynamic responses throughout the economy [econometric studies] do not come close to accurately capturing the full long-run effects of immigration.” (Bodvarsson and Van Den Berg, 2009, 155).

The failure of spatial correlation studies to find the expected adverse effects of migrant on resident workers, and disagreement about the appropriate assumptions in national models of migrant and resident worker interactions, has limited the impacts of econometric studies on policy. The Borjas studies that assume substitutability between migrants and resident workers and find wage depression are cited by restrictionists urging less migration, while admissionists point to studies such as those by Ottaviano and Peri to argue for more migrant workers.

**Other Economic Effects**
Productivity growth, producing more with less, is the ultimate source of economic and income growth. Entrepreneurship and innovation are often

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22 The US work force includes persons 16 and older. Ottaviano and Peri included US-born high school students with migrants in the young and not-completed secondary school group, which Borjas, Grogger and Hanson (2008) found explained the Ottaviano and Peri complements within cells estimate.

23 There are many definitions of entrepreneurship, but a common one considers entrepreneurs to be persons who transform innovations into economic goods. Some definitions stress the risks accepted by entrepreneurs when it is not clear that they will
credited with raising productivity, and immigrants are frequently associated with both. Immigrant entrepreneurship is visible in high-tech start up businesses as well as ethnic restaurants and gardening services. Innovation can be measured by the share of foreign-born students in science and engineering or the share of patents issued to foreign-born residents.

There were almost 10 million self-employed workers among the 140 million employed persons in the US in 2010, including 40 percent in management occupations such as consulting, 20 percent in service occupations such as restaurants and gardening, 15 percent in farming and construction occupations, and 15 percent in sales occupations (US Statistical Abstract, 2012, Table 606). Self employment is slightly higher for foreign-born than US-born workers. In 2009, seven percent of US born workers were self employed, versus 7.4 percent of foreign-born workers (Hipple, 2010, p24).

There are significant differences in self-employment rates by country of origin, level of education, and other factors. US-born residents from countries such as Korea and Middle Eastern countries such as Iran, Lebanon and Syria have very high rates of self-employment, perhaps reflecting relatively high levels of education and access to capital. Middle Eastern and Korean immigrants are visible operating retail shops and other businesses in central cities.

Do immigrants have higher rates of self-employment because they are entrepreneurial or because they cannot find “regular” jobs. Economists believe that most workers prefer to work for wages and benefits, meaning they shift from farming to wage work or from consulting to wage work when jobs are available. In most industrial economies, self-employment declines as the share of farmers falls, and many professions once dominated by self-employed professionals such as doctors increasing have wage workers. There are also business-cycle effects, as self-employment rates rise with unemployment: “self-employment rises during recessions when regular jobs may be harder to find and laid-off executives may enter self-employed ‘consulting’.” (Filer et al, 1996, p364).

Are the 1.5 million US immigrants who are self-employed the keys to US economic success? If yes, which self-employed immigrants are most crucial? Miami has the highest rate of immigrant self-employment in the US, and Portes (1995) credits immigrant entrepreneurs with revitalizing inner-city neighborhoods by creating or expanding businesses that serve fellow immigrants and natives. Other analysts looking at self-employment point to long hours and low wages for the workers hired in ethnic businesses, a concern sometimes dismissed by those who believe that ethnic communities rather than labor inspectors can police the treatment of workers in local businesses.

be successful, while others emphasize the quest of many entrepreneurs for venture and other capital to launch their businesses.

24 An innovation is a better or more effective product or service.

25 Some 7.5 percent of foreign-born workers who had become naturalized US citizens were self employed and unincorporated, versus 7.3 percent of foreign-born non-US citizens.
The links between immigration and innovation are also murky. Immigrants are widely seen as innovators, and there are frequent references to the large share of Nobel prizes awarded to immigrants and the high share of students who win science prizes who are immigrants or the children of immigrants. The most studied measure of innovation is patents, and a commonly cited conclusion is that increasing the share of college-educated immigrants in a state is associated with up to 10 percent more patents per capita in that state (Hunt and Gauthier-Loiselle, 2010).

However, Mare et al (2011) found no relationship between workforce characteristics and innovation. Critics of the implied immigration-innovation link emphasize that, with immigrants concentrated in fields such as science and engineering where many patents are issued, immigrants should have higher patent rates than US-born professionals concentrated in business and law. If patent measures are standardized to reflect the shares of foreign- and US-born workers in fields associated with patents, such as science and engineering, immigrant patent rates are the same as the rates for US-born workers.

What about immigrants in high-tech fields such as IT? It is often asserted that Silicon Valley depends on immigrants, mostly from China and India. Wadhwa et al (2008) reported that well-educated immigrants were founders or co-founders of a quarter of 28,000 US IT start ups launched between 1995 and 2008. Almost all of the founder immigrants in these IT-firms had more than college degrees (a quarter had PhDs), and the largest group was born in India. Wadhwa says that this shows that “legal, skilled immigrants are contributing significantly to the U.S. economy…and are helping the U.S. keep its global lead.”

There is no easy way to assess immigrant entrepreneurship and innovation. The proxies for the underlying variables of interest are imperfect, and the methods of analysis do not establish conclusive answers. Policy makers may want to encourage some types of entrepreneurship and innovation, but filling research gaps in ways that influence migration policy in this area is very difficult.

Conclusions
The US admits over a million immigrants a year and several hundred thousand temporary foreign workers. Net unauthorized or illegal migration, which averaged over 300,000 a year over the past decade, appears to have stopped from Mexico, the source of more than half of the unauthorized, due to stepped up border and interior enforcement in the US, the high unemployment rates persisting from the 2008-09 recession, and improving conditions in Mexico.

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26 A typical assertion: “It’s well known that America’s high-tech economy has prospered thanks largely to highly educated foreigners.” Business Week, July 9, 2010. www.businessweek.com/investor/content/jul2010/pi2010079_863838.htm

The effects of immigrants, temporary workers, and unauthorized workers on the US economy and labor market are hotly debated. Economic theory and the most comprehensive macroeconomic study find that adding workers to the labor supply via immigration reduces wages (or wage growth) by about three percent and enlarges the US economy by about a tenth of one percent. The major beneficiaries of immigration in this increase-labor-supply-and-depress-wages model are the immigrants who earn higher wages, US owners of capital and land, and some complementary US workers. The major losers are workers similar to the immigrants, including previous immigrants.

Case studies confirm the wage depressing and worker displacement effects of especially unauthorized workers in particular labor markets, highlighting the importance of intermediaries in introducing migrant workers into the industry and path dependency, as when a particular industry becomes more dependent on migrant workers over time. However, econometric studies that examine wages and unemployment rates in cities with different shares of immigrant workers in their labor forces cannot find adverse effects of immigrants on native workers believed to be similar to the immigrants, leading some economists to assert that migrants have few or no adverse effects.

So-called spatial-correlation or city comparison studies may miss migrant effects if US workers who would compete with migrants move away from “immigrant cities” or do not move to them. For this reason, there has been a new generation of national studies that group immigrant and native workers into age and education cells and look at how immigrants and natives interact. The results of these studies depend largely on the assumptions made about the nature of immigrant-native worker interactions. If we assume that 25 to 30 year old immigrants with less than a high-school education compete with similar US workers, the immigrants adversely affect the natives. If the immigrants fill different jobs than similar US-born workers, they complement the US workers.

Immigrants have other economic effects as well, on public finance and innovation and entrepreneurship. However, the fact that foreign-born US residents are more likely to obtain patents than US-born residents may say more about the concentration of foreign-born workers in fields such as science and engineering where many patents are issued. Similarly, the fact that the foreign-born have a slightly higher rate of self-employment may reflect their lack of English and connections to good jobs as much as more entrepreneurship.

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