Skilled Immigrants' Contribution to Innovation and Entrepreneurship in the United States *

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Abstract

Skilled immigrants to the United States, defined as those with a college degree, outperform college–educated natives in terms of wages, patenting, commercializing or licensing patents, and publishing. This success is due to immigrants who originally entered the United States on a student/trainee visa or a temporary work visa, and is explained by their different fields of study and higher level of education. Skilled immigrants are also more likely to start successful companies than their native counterparts, apparently owing to higher unmeasured entrepreneurial ability. The effect of skilled immigration on per–capita patenting, publishing and starting companies could be larger than implied by immigrants' individual success, if immigrants have positive spill–overs on natives, or could be smaller, if immigration discourages native endeavors. For patenting, there is evidence that immigrants have positive spill–overs.

Skilled immigration has the potential to increase a country's capacity for innovation, thereby boosting productivity growth and ultimately economic growth. To the extent that innovation has a public good component, skilled immigrants might increase the receiving country's per capita welfare simply by increasing the size of the population likely to innovate or have skills complementary to innovation, such as entrepreneurship. However, immigrants might outperform natives if a combination of self–selection and the visa system leads immigrants to be inherently more innovative or entrepreneurial. Alternatively, immigrants may have similar (or lesser) inherent abilities, but be more concentrated in the highest education groups, or more specialized in relevant fields of study and occupations. In either case, immigrants' contribution to innovation could go beyond their own innovation and entrepreneurship, if their presence increases the performance of native collaborators, or if their innovations are inputs to the innovation process of natives who are not collaborators.

While it may appear obvious that a country's total factor productivity benefits from the presence of creative, inventive and entrepreneurial immigrants, certain conditions must hold for this to be true. It must be the case that immigrants would have been less innovative abroad, or would not have been able to commercialize their innovation as effectively abroad, or that innovation and its dissemination and commercialization abroad benefit natives less than when these occur at home. These conditions seems likely to hold for the United States.[1] It must also be the case that immigration does not significantly discourage native endeavors in innovation or entrepreneurship, or that any discouragement is mitigated by the productivity gain from workers' greater exploitation of their comparative advantage. There is only partial evidence on this question.[2]

In research co–authored in part with Marjolaine Gauthier–Loiselle, I examine the link

[1] Kahn and MacGarvie (2008) provide evidence for the first condition, Eaton and Kortum (1999) for the third, while popular wisdom supports the second.

[2] Peri and Sparber (2008) show that skilled natives react to skilled immigration by entering occupations with more communicative and interactive skill requirements, in line with their comparative advantage. Borjas (2006) does not find that immigration deters natives as a whole from attending graduate school. Jackson (2009) examines the effect of the skill mix of immigration, but not the level of immigration, on native college attendance.

between skilled immigration to the United States and innovation and entrepreneurship.[3] The indicators of innovation and entrepreneurship I consider are patenting, commercializing and licensing patents, publishing books and papers and writing papers for presentation at major conferences, and starting successful companies. I use patents to proxy for inventions, which have the potential to increase total factor productivity. While in the short run the purpose of a patent is to keep the benefit of an invention private, once the patent expires or is licensed, the invention may be used by other firms to increase their productivity. Patenting may also be correlated with innovations embodied in tacit knowledge and disseminated by inter–firm worker mobility. I use the publication and presentation of books and papers to measure dissemination of potentially innovative knowledge created both academically and commercially. Since innovation must be commercialized in order to increase total factor productivity, I seek evidence of the commercialization of innovation in the commercialization and licensing of patents, and in the founding of successful companies.

I use individual–level data from the 2003 National Survey of College Graduates to establish that skilled immigrants outperform skilled natives on all of these measures, and to investigate why this is so, and on what visas the successful immigrants initially entered the United States. For patents I go further, and undertake state–level analysis, using data compiled from the decennial censuses of 1940–2000 and data from the U.S. Patent and Trademark Office, to estimate the causal effects of skilled immigration on patenting per capita, inclusive of any positive or negative spill–overs of immigrants.

I find that the success of immigrants is due to those who originally entered the United States on a student/trainee visa or a temporary work visa, and is explained (except for the case of starting companies) by their different fields of study and higher level of education. The immigrant advantage in starting successful companies is not explained by differences in measured characteristics, and may be caused by greater unmeasured entrepreneurial ability on the part of immigrants. The estimates of the causal impact of skilled immigration on patenting per capita are consistent with positive spill–overs

[3]Hunt (2009), Hunt and Gauthier–Loiselle (2010).

of immigrants on natives, and suggest that immigration was responsible for one third of the large rise in patenting per capita in the 1990s. Together, the evidence suggests skilled immigration to the United States is likely to have raised total factor productivity considerably.[4]

1 Data

My individual–level analysis is based on the 2003 wave of the National Survey of College Graduates (NSCG). The survey is a stratified random sample of respondents to the 2000 census long form who reported having a bachelor's degree or higher. All respondents who have ever worked are asked a series of questions concerning the five–year window since October 1998: how many distinct papers they had (co–)authored for presentation at regional, national or international conferences; how many papers they had (co–)authored had been accepted for publication in refereed professional journals; how many books or monographs they had (co–)authored had been accepted for publication; how many U.S. patent applications they had made; how many U.S. patents had been granted; how many granted patents had resulted in commercialized products or processes or had been licensed.

Questions asked of all respondents currently working allow me to construct a dummy variable for whether the respondent had in the last five years founded a company that currently has more than ten employees. I would prefer to capture companies with at least one employee, but I must rely on the firm size variable whose smallest category is ten or fewer employees. I construct hourly wages from salary, weeks and hours on the principal job.

Immigrants (defined by birthplace) are also asked about the type of visa they held when they first went to the United States for six months or more. Information on whether each educational degree was received in the United States allows me to sub–divide the

[4] Relevant existing papers on immigration and patenting include Chellaraj, Maskus and Mattoo (2008), Kerr (2008), Kerr and Lincoln (2010), Morgan, Kruytbosch and Kannankutty (2001), Peri (2007), and Stuen, Mobarak and Maskus (2010). Papers on initial immigrant visa and earnings include Lowell and Avato (2007), Massey and Nalone (2002) and Sweetman and Warman (2009).

student/trainee visa category according to the stage of their studies at which immigrants arrived.

The sample I use to study publishing and patenting contains all those (under age 65) who have ever worked, while the samples for wages and start–ups are of respondents (under age 65) currently working.

The patent data used in the state–level analysis come from the U.S. Patent and Trademark Office (USPTO). Patents are attributed to states based on the home address of the first inventor on the patent. Patents are classified according to application (filing) date. The information on the shares of skilled immigrants and natives in each state, as well as other characteristics of states, come from the IPUMS microdata of the decennial censuses (Ruggles et al. 2010). Alaska and Hawaii are dropped from the analysis, leaving a panel of 48 states over ten yearly intervals from 1940–2000.

2 Immigrant performance relative to native performance

2.1 Characteristics of immigrants and natives

I begin by showing in Table 1 how the publication and patenting sample is distributed by nativity and entry visa (the other samples are similar). Respondents born abroad outside U.S. territories and without U.S. citizenship (my definition of immigrant) are 12% of the weighted sample. Column 2 shows that 43% of immigrants still in the United States originally entered on a "green card", or permanent resident visa, while 12% originally entered on a temporary work visa. 24% entered on a temporary student or trainee visa, of whom 7.2% entered for college (bachelor's) study, 9.6% for graduate school (master's or doctoral) study, and 2.1% after completing a doctoral or professional degree abroad (post–doctoral research fellows and medical residents or fellows). The residual student/trainee ("other") group, 5.5% of immigrants, entered for high school study or as trainees in firms. 11.6% of immigrants originally entered the United States as dependents of a temporary

visa holder, while another 9.0% entered on an unspecified other type of temporary visa.

Panel A of Table 2 shows that immigrants are much more likely than natives to have studied computer science/mathematics (an aggregate field dominated by computer science), physical science and especially engineering for their highest degree. Clearly, this is likely to increase immigrant patenting performance relative to natives. Panel B, which divides immigrants by entry visa, shows that the overrepresentation of immigrants in computer science and engineering is particularly strong for immigrants who arrived for graduate school and on work visas, while the overrepresentation in physical science is particularly strong for those who arrived for graduate school and as post–doctoral fellows. However, most post–doctoral fellows are in biological science and medicine ("S&E related").

In columns 1–4 of Table 3, I show that immigrants are considerably more educated than natives, which will tend to raise their earnings and publishing rates. Panel A shows that immigrants have more of every type of post–college degree than natives, with the gap especially large for doctoral degrees, the degree most relevant for publishing. Panel B shows that immigrants in every visa group except those who arrived on a green card and on "other" student/trainee visas have more education than natives, including those who arrived for college.

Column 5 of Table 3 indicates that there are no large differences in current age across the various native and immigrants groups, which explains why age is not an important factor in explaining outcomes across groups in the analysis below. Age at arrival in the destination country is known to be an important predictor of wages for immigrants – wages are higher the younger an immigrant was at arrival. The immigrants youngest on arrival are dependents of temporary visa holders (a mix of children and spouses of the visa holder), while the oldest on arrival are those who arrived on work visas and as post–docs (column 6), each group with an average age of 29.7. Column 7 shows the share of each entry visa group with a highest degree earned in the United States, which is relevant as a U.S. degree boosts wages. Appendix Table 1 gives the means of other characteristics by entry visa.

2.2 Outcomes of immigrants and natives

Table 4 shows the first evidence on the performance of immigrants compared to natives. All differences between immigrants and natives are statistically significant.[5] Column 1 shows that immigrants earn $30.70 per hour compared to $29.60 for natives, a narrow immigrant advantage. Column 2 indicates that 0.6% of natives but 0.8% of immigrants have started a company with more than ten workers in the previous five years, a large immigrant advantage.

Column 3 shows that immigrants are more than twice as likely to patent as natives – 2.0% of immigrants have patented in the previous five years, compared to only 0.9% of natives – while column 4 shows the immigrant advantage is similar for licensing or commercializing patents – 1.3% of immigrants have done so, compared to 0.6% natives. As patents must be licensed or commercialized to contribute to productivity, I focus on this outcome in subsequent analysis. There is no immigrant/native difference in the number of patents per respondent for respondents who have patented, so I do not explore this dimension.

Columns 5 and 6 present statistics on publishing books or articles or authoring papers for regional, national or international conference presentations (which for conciseness I refer to as publishing). 17.6% of immigrants had published (column 5), compared to 14.4% of natives, a modest immigrant advantage. However, in this case there is an immigrant/native difference in the frequency of this activity. Column 6 indicates that almost twice as many immigrants as natives had published more than six times – 6.8% compared to 3.6%. I focus on frequent publishing in the subsequent analysis, assuming that frequent publishers are the key researchers for innovation, though I have no measure of publication quality.

I next use regression analysis to see whether the immigrant advantage over natives still exists when immigrants and natives with similar characteristics are compared. I use weighted least squares to examine the immigrant/native gap in wages, and probits to

[5]The difference in column 2 is statistically significant at the 6% level.

examine the gaps in the other, binary, outcomes. The results are reported in Table 5. The first column reproduces the raw gaps implicit in Table 4: immigrants earn 2.9% more than natives, have a propensity to commercialize patents that is 0.7 percentage points higher than the native propensity of 0.6%, have a propensity to publish more than six papers that is 3.1 percentage points higher than the native propensity of 3.6%, and have a propensity to start successful companies that is 0.18 percentage points higher than the native propensity of 0.61%.

The second column displays the results of comparing immigrants and natives with the same field of study, level of education, age, race and student status.[6] For wages, commercializing patents, and frequent publishing, the adjusted gaps are quite different from the raw gaps. Immigrants earn considerably less, by 8.2%, than similar natives, have the same propensity to commercialize patents as similar natives, and have a scarcely higher propensity to publish more than six papers (the advantage is only one tenth of the advantage in the raw gap in column 1). The key characteristics explaining the difference between the columns are the field of study of the highest degree and the level of education. Immigrants earn more, commercialize patents and publish more frequently than natives because they have higher education, and fields of study that are more remunerative, more likely to be in science and engineering, and more associated with frequent publishing.

Conversely, the immigrant advantage over natives in start–ups is the same when similar immigrants and natives are compared in column 2 as in the raw gap of column 1. Immigrants' heavy concentration among master's and doctoral degree holders is not helpful for founding companies, which tend to be founded by holders of bachelor's or professional degrees, and immigrants are only slightly more concentrated in fields of study associated with starting companies. Their raw advantage is therefore not explained by their superior measured characteristics, but may reflect greater unmeasured entrepreneurial ability.

For policy purposes, it is useful to examine the entry visa types associated with immigrant success in the outcomes considered. This is not possible for firm start–ups, as there are too few to examine separately by entry visa. However, Figure 1 plots the raw immi-

[6]There are some additional controls for wages and publications – see the table notes.

grant advantage by entry visa for wages (top graph), patent commercialization (middle graph) and frequent publication (bottom graph). In each graph, the vertical line at zero represents the native baseline, and the x's indicate the relative performance of immigrants in each entry visa. The horizontal lines trace out the 95% confidence interval – statistically speaking, two x's may only be considered reliably different if their 95% confidence intervals do not overlap, and an x is only reliably different from the native value if its 95% confidence interval does not intersect the vertical line at 0.

All three graphs show that the immigrant wage advantage is driven by immigrants who entered on a work visa or as a student. With one exception ("other" students and wages) all five of these groups statistically significantly outperform natives on all outcomes, while immigrants who entered on green cards, as dependents of a temporary visa holder, or as a holder of an unspecified temporary visa do not outperform natives on any outcome. Immigrants who entered as college students earn 10% more than natives, while those who entered as work visa holders or graduate students earn almost 20% more, and those who entered as post–docs (or medical residents) even more. Immigrants who entered as graduate students or post–docs are more than five percentage points more likely to commercialize a patent than natives. This is an enormous advantage, given that only 0.6% of natives commercialize a patent: it means that more than 5.6% of graduate students and post–docs commercialize a patent. The post–doc advantage in publishing frequently is even more extreme, though less surprising, as it is the job of a post–doc to publish.

In Figure 2, I display the results of regressions I use to investigate the reasons for the immigrant success in Figure 1. In effect, I display the immigrant performance advantage, by entry visa, when immigrants are compared to natives with the same field of study and level of education. The top graph shows that no entry visa group has higher wages than similar natives, though the wages of immigrants who entered on a work visa and as college students are similar to those of natives. Similarly, the middle graph shows that each entry visa group has a propensity to commercialize a patent that is at best similar to that of similar natives. The results for the probability of publishing frequently, in the

bottom graph, are somewhat different, as post–docs and "other" students retain a large advantage even when compared to similar natives.

2.3 The causal impact of skilled immigrants on patenting per capita

In the previous section, I established that immigrants who entered on temporary work visas or as students outperform natives on wages, commercializing patents and frequent publishing, and starting successful companies. The impact of skilled immigration on patenting, publishing and founding companies could be greater or less than the impact implied by the individual success of immigrants, however, due to the possible existence of positive or negative spill–overs. For this reason, Marjolaine Gauthier–Loiselle and I use the panel of U.S. states to analyze the impact of skilled immigration on patenting per capita and capture the effect net of any positive or negative spill–overs.

Figure 1 shows the evolution of total (U.S. origin) U.S. patents and patents per 100,000 residents from 1941-2001, the study period. Patents fluctuate over time, culminating in a large increase from the early 1980s on. The time–series of patents is not thought to reflect the pace of technological change, but rather the financial resources of the USPTO (Griliches 1990) and changes in incentives to patent (Hall 2004). Figure 4 displays the time–series of skilled immigration to the United States, with a skilled immigrant defined either as college–educated, having post–college education, or being in a science or engineering occupation. All three measures indicate that the share of skilled immigrants in the population (or workforce, in the case of scientists and engineers) has been accelerating since 1960.

We do not identify the impact of skilled immigration from national trends, however, but from the relation between changes in immigration and changes in patenting per capita over time within each state after national trends in patenting have been controlled for. We also adopt a technique to account for reverse causality. Any positive association between skilled immigration and patenting could stem not only from a causal impact of

immigration on patenting, but from skilled immigrants' being attracted to live in states with growing patenting. We use the instrumental variables technique to isolate the causal effect of interest.[7]

The analysis shows evidence of positive spill–overs of immigrants, since the estimates of their impact on patents per capita are higher than implied by the individual–level NSCG: a one percentage point rise in the share of immigrant college graduates in the population increases patents per capita by 9–18%. This means that the 1990–2000 increase in the population share of this group from 2.2% to 3.5% increased patents per capita by 12–21% in a period when patents per capita rose 63%. We find that immigrants who work as scientists and engineers or who have post–college education boost patents per capita more than immigrant college graduates.

3 Conclusion

College–educated immigrants to the United States outperform college–educated natives in activities likely to increase U.S. total factor productivity: patenting, licensing and commercializing patents, publishing or presenting books or papers, and starting successful companies. They also have higher wages than their native counterparts. The success of these immigrants is due to those who initially entered the United States on a temporary student or work visa – those who entered on a green card or other visa do not outperform natives on any outcome. The reason that immigrants who entered on a student or work visa are so successful is that they are more educated than natives, and are disproportionately likely to have a highest degree in a science and engineering field, a field in which a lot of publishing takes place or in a well–remunerated field. Only the immigrant advantage in starting successful companies is not explained by these factors. College–educated immigrants seem to have higher unmeasured entrepreneurial ability than college–educated natives, due to a combination of self–selection and the visa system.

[7]The excluded instrument is the predicted increase in skilled immigrant shares, based on states' shares of 1940 immigrants from various countries and subsequent national growth in skilled immigrants from those countries.

These results based on individual–level data suggest that skilled immigrants boost U.S. total factor productivity, and thereby per capita GDP growth. However, the impact may be higher than implied by individual immigrant success, if immigrants enhance the productivity of natives, or lower, if immigrants discourage native endeavors in productivity–enhancing activities. Analysis of a panel of states provides the causal impact of skilled immigration on patenting per capita, inclusive of any spill–over effects. The results suggest there are positive spill–overs of immigrants on natives, and indicate that immigration of college graduates was responsible for one third of the large rise in patenting per capita in the 1990s. Furman, Porter and Stern (2002) find that the elasticity of a country's GDP with respect to its patent stock is 0.113, controlling for capital and labor. This elasticity implies that the influx of immigrant college graduates in the 1990s increased U.S. GDP per capita by 1.4–2.4%.

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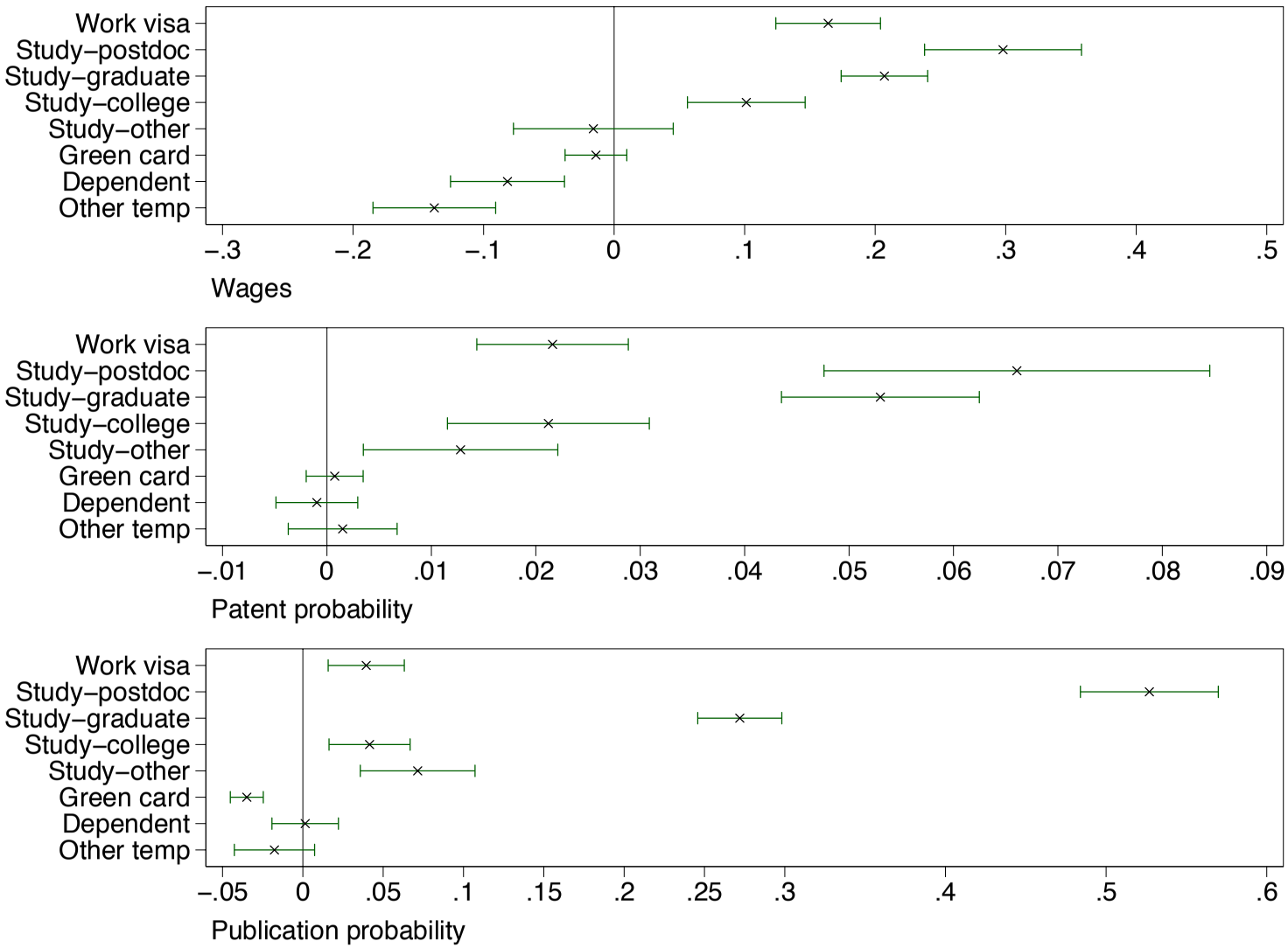
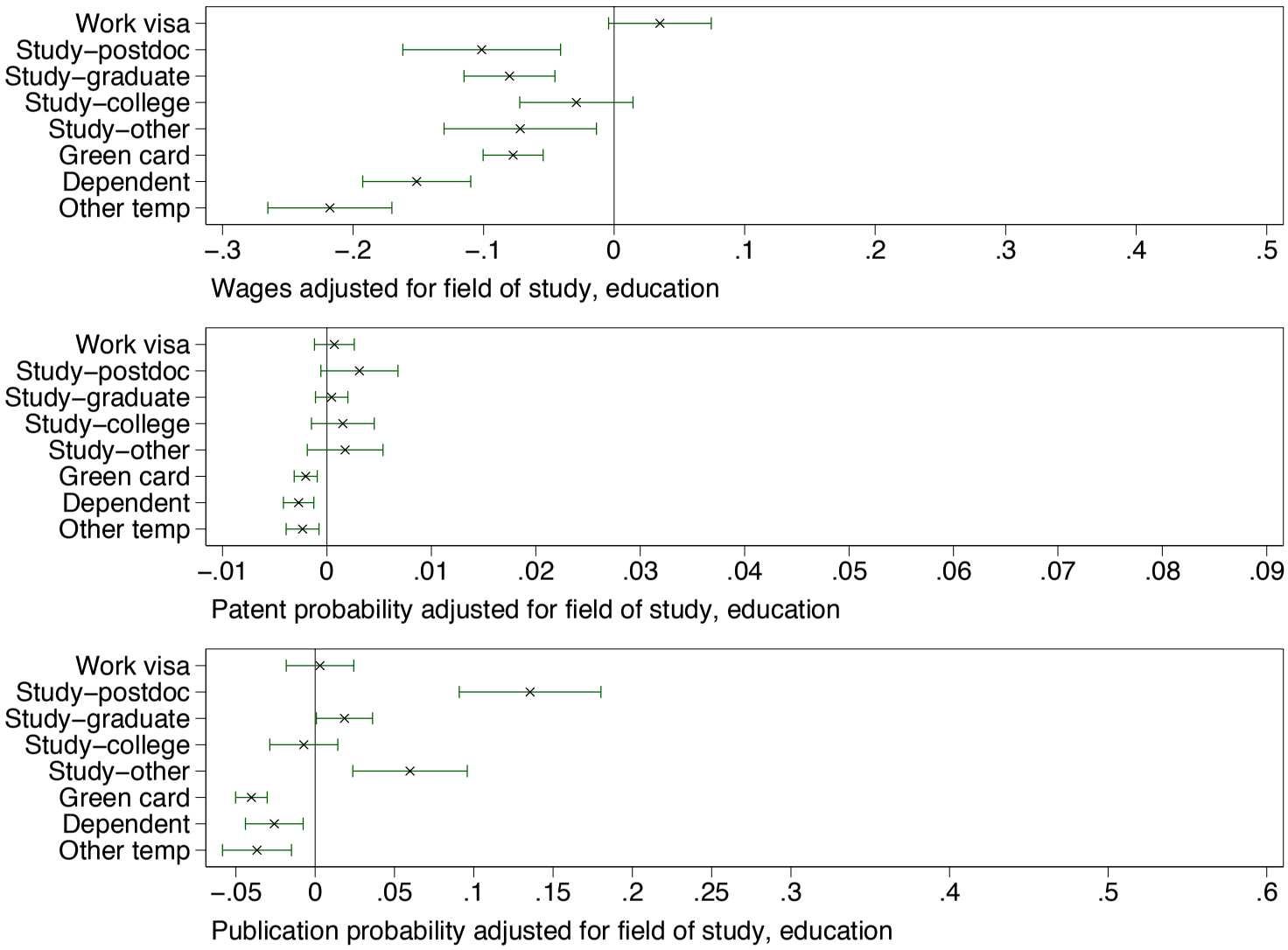
Figure 1: Wages, patent commercialization and frequent publishing, relative to natives



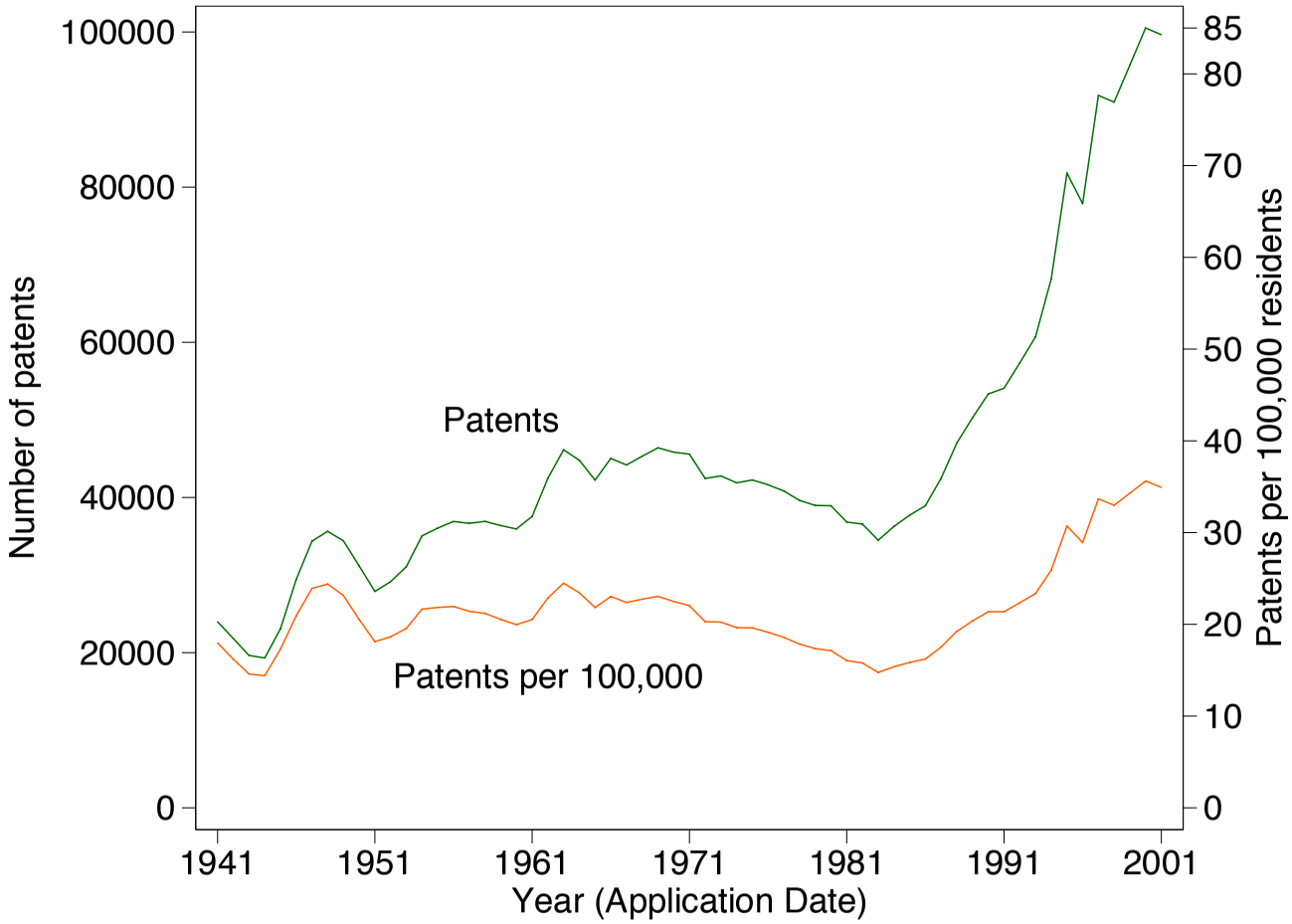
Notes: The native patent commercialization rate is 0.6% or 0.006, the native frequent publication and presentation rate is 3.6% or 0.036. The x's plot the coefficients from weighted least squares regressions (for log wages, 75,940 observations), or marginal effects from weighted probit regressions (for patents and publications, 90,293 observations), and the horizontal lines the (robust) 95% confidence intervals.

Figure 2: Wages, patent commercialization and frequent publishing, relative to similar natives



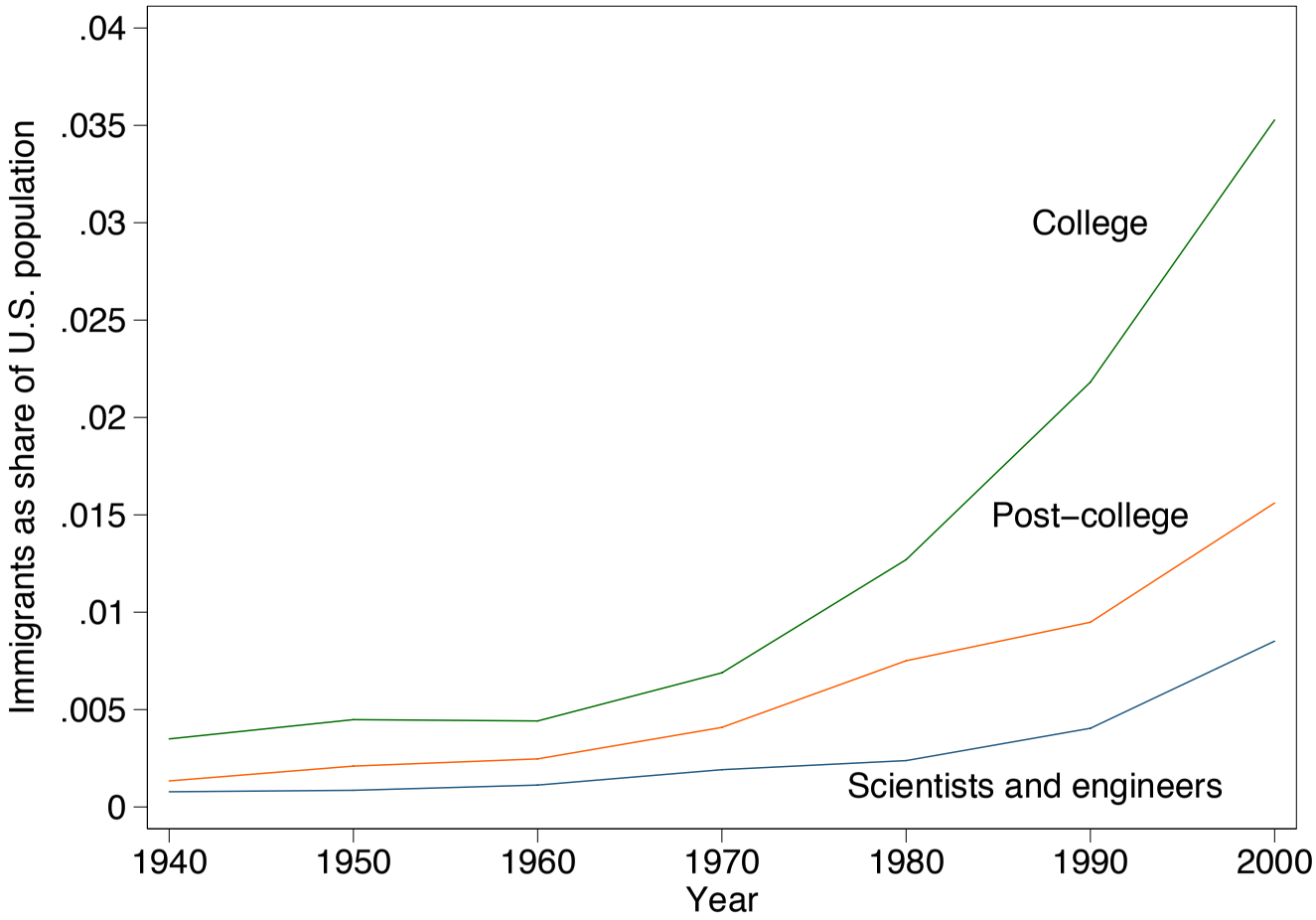
Notes: The native patent commercialization rate is 0.6% or 0.006, the native frequent publication and presentation rate is 3.6% or 0.036. The x's plot the coefficients from weighted least squares regressions (for log wages, 75,940 observations), or marginal effects from weighted probit regressions (for patents and publications, 90,293 observations), and the horizontal lines the (robust) 95% confidence intervals. Each regression also includes dummies for born American abroad and born in U.S. territories. Field of highest degree is controlled for with 29 dummies, education with dummies for master's, doctorate and professional degrees.

Figure 3: U.S. Origin U.S. Patents 1941–2001



Source: USPTO, BEA and authors' calculations.

Figure 4: Skilled Immigrants as Share of U.S. Population 1940-2000



Note: Shares based on population 18–65 for college and post–college and workforce 18-65 for scientists and engineers.
Source: U.S. Census.

Table 1: Shares of natives and immigrants by entry visa (%)

	(1) Full sample	(2) Immigrants
U.S. native	86.4	--
Born American abroad	1.1	--
Born in U.S. territories	0.3	--
Green card	5.2	43.1
Work, temporary	1.5	12.0
Study/training, temporary		
- for college	0.9	7.2
- for graduate school	1.2	9.6
- for post-doc	0.3	2.1
- for other	0.7	5.5
Dependent, temporary	1.4	11.6
Other temporary	1.1	9.0
	100	100

Notes: Shares weighted with survey weights. Sample of people who have ever worked. 90,293 observations.

Table 2: Weighted means of field of study of highest degree by entry visa (%)

	(1) CS, Math	(2) Biological science	(3) Physical science	(4) Social science	(5) Eng-ineering	(6) S&E related	(7) Non S&E
A. Immigrant vs native							
U.S. native	3.6	4.0	1.7	10.8	5.3	12.2	62.4
Immigrant	8.5	5.5	3.7	9.1	14.4	16.8	41.9
B. Entry visa type							
Green card	5.5	4.3	3.2	9.4	11.8	18.1	47.7
Work	13.8	3.2	3.7	7.0	21.9	18.8	31.7
Dependent	9.0	6.6	2.7	13.0	8.3	14.7	45.7
Other temporary	6.8	4.9	3.3	10.0	12.2	16.2	46.5
Study/training							
- for college	9.8	4.7	2.2	7.3	18.8	12.0	45.1
- for grad school	16.8	9.7	6.8	6.2	25.1	8.7	26.8
- for post-doc	3.7	24.2	11.6	1.3	3.6	50.4	5.1
- for other	6.9	6.5	4.9	11.8	14.2	15.8	39.8

Notes: Means of patenting and publishing sample, 90,293 observations, weighted with survey weights. The rows sum to 100. "S&E" means science and engineering. S&E related is principally health. Means for Americans born abroad and individuals born in U.S. territories are not reported.

Table 3: Weighted means of other covariates by entry visa (%, except ages)

	(1) Bachelor's	(2) Master's	(3) Doc-torate	(4) Prof-essional	(5) Age	(6) Age at arrival	(7) U.S. highest degree
A. Immigrant vs native							
U.S. native	65.0	26.0	2.9	6.2	44.4	--	99.6
Immigrant	56.5	28.6	7.7	7.2	43.3	23.3	55.5
B. Entry visa type							
Green card	67.1	22.5	2.7	7.7	44.2	21.0	56.9
Work	61.6	28.6	6.0	3.8	42.0	29.7	17.6
Dependent	60.4	27.3	4.8	7.4	40.8	18.0	60.4
Other temporary	62.8	25.2	3.8	8.3	44.8	27.4	35.7
Study/training							
- for college	53.2	34.6	7.7	4.6	42.9	21.5	97.9
- for grad school	0	63.7	33.2	3.1	42.3	26.0	100.0
- for post-doc	0	0	51.0	49.0	46.2	29.7	0.0
- for other	68.5	26.4	2.3	2.9	42.6	23.4	37.6

Notes: Means of patenting and publishing sample, 90,293 observations, weighted with survey weights. Master's degrees include MBAs. Means for Americans born abroad and individuals born in U.S. territories are not reported.

Table 4: Weighted means of outcomes by immigrant status

	(1) Hourly wage ($)	(2) Started firm with more than ten workers (%)	(3) Any patent (%) Granted	(4) Any patent (%) Commer-cialized	(5) Publication (%) Any	(6) Publication (%) More than six
U.S. native	29.6	0.6	0.9	0.6	14.4	3.6
Immigrant	30.7	0.8	2.0	1.3	17.6	6.8
Observations	75,940	78,925		90,293		

Notes: Means weighted with survey weights. Publications include published books or journal articles or papers authored for regional, national or international conference presentations. Means for Americans born abroad and individuals born in U.S. territories are not reported.

Table 5: Immigrant performance advantage over natives (% or percentage points)

	(1) Simple comparison	(2) Comparison of similar immigrants and natives
Wages	2.9**	-8.2**
Any patent licensed or commercialized (native propensity = 0.6%)	0.7**	-0.0
More than six publications or papers (native propensity = 3.6%)	3.1**	0.3**
Started firm with more than ten workers (native propensity = 0.61%)	0.18*	0.21**

Notes: Coefficients from least squares regressions (log wages) or marginal effects from probits (patents, publications, start-ups), weighted with survey weights. Each coefficient or marginal effect is from a different regression, and in each case the omitted category is U.S. native. Each regression also includes dummies for born American abroad and for those born in U.S. territories. 75,940 observations in for wages, 90,293 observations for patents and publications, 78,925 observations for start-ups. The covariates in column 2 comprise 29 dummies for field of highest degree (28 for start-ups), dummies for master's, doctorate and professional degrees, dummies for black non-Hispanic, Hispanic and mixed-race non-Hispanic, a cubic in age, dummies for full-time master's student, full-time doctoral student, and other student. For wages they also include a quadratic in tenure and 8 dummies for census region, while for publications they also include a dummy for working and its interaction with employment at a university. ** indicates coefficients significant at the 5% level, * indicates coefficients significant at the 10% level, based on robust standard errors.

Appendix Table: Weighted means of covariates entry visa (% unless specified)

	(1) Female	(2) White, non-hispanic	(3) Currently employed	(4) Currently employed* university	(5) Tenure (years)	(6) Self-employed
A. Immigrant vs native						
U.S. native	50.4	88.0	85.5	4.8	8.4	16.5
Immigrant	47.0	30.9	86.3	8.0	6.7	17.7
B. Entry visa type						
Green card	51.9	30.9	85.1	4.9	7.4	17.2
Work	35.2	37.7	92.1	5.4	5.8	18.0
Dependent	67.0	33.5	81.0	7.5	5.4	19.7
Other temporary	45.6	31.1	84.3	5.5	6.5	17.7
Study/training						
- for college	33.4	31.9	87.5	8.1	6.5	20.2
- for grad school	32.2	18.6	91.1	18.8	5.9	13.9
- for post-doc	27.9	39.6	94.5	38.2	8.0	17.3
- for other	45.4	27.4	85.3	12.0	7.0	20.4
Observations			90,293		75,940	

Notes: Means of patent and publication sample columns 1-4 and wage sample columns 35-6, weighted with survey weights. Means for Americans born abroad and individuals born in U.S. territories are not reported.