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Immigration and Innovation

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The United States economy has a comparative advantage in science and innovation. The country of Apple, Google, Facebook, Ford, General Motors, Boeing, Microsoft and FedEx thrives by creating new products and introducing entirely new markets. The American economy is innovation-driven, and such innovation requires, first and foremost, people with good ideas and skilled workers who can transform those ideas into marketable products. Where does all this talent that our economy is built on originate? Are we the innovation leaders because we have a monopoly on talent in the world?

The basic data suggest otherwise. American secondary school students consistently rank toward the bottom among their counterparts in other countries of the Organization for Economic Cooperation and Development in tests measuring science and mathematics aptitude. The United States has sustained its primary position as developer of new scientific knowledge and product innovations, despite the deficiencies in math and science training, with the immigration of skilled workers.

Talented people across the world are attracted to the institutions that the United States has carefully cultivated to support innovation. By any reasonable assessment, a clear majority of the world's top universities are in the United States. These universities

attract talent from all over the globe. Most engineering Ph.D.'s granted at American universities now go to people born abroad. In a recently published paper, my colleagues and I show that these foreign-born doctoral students create new scientific knowledge and fuel innovation at science and engineering labs at American universities. In that paper, increases in the supply of foreign students subsequently result in significantly greater publications and citations from science and engineering departments in the United States. Many of those students remain in the country after graduation and contribute to the innovations produced by American companies.

Such data on the contributions of foreign students to American innovation strongly support the spirit and the central provisions of immigration reform proposals offered by the White House and by Senators Orrin Hatch, Marco Rubio, Amy Klobuchar and Chris Coons. (Three of the senators are members of the Senate Judiciary Committee, which will take up the issue of comprehensive immigration reform at a hearing on Wednesday.) If talented foreigners want to study and work in the United States, economic logic and the data suggest that we should welcome them. American companies working in the very sectors where our comparative advantage lies benefit from their presence. Such a policy also creates other rare but significant benefits for the future of the nation. A typical profile of a recent Nobel laureate is a United States citizen or someone trained or teaching at an American university, but who was born in a foreign country.

One might be tempted to conclude from this narrative that our immigration system is working well, but this conclusion is premature and dangerous for two reasons. First, the United States is not the only country in the market for that talent. Three of the

five most recent Nobel laureates from Britain were not born there. Australian and British educators were overjoyed with the quality of their international student applicant pool when the United States instituted restrictions on student visas after 9/11. Other countries deliberately pursue immigration policies to spur innovation.

Second, it's impossible to know the counterfactual: how much better off we would have been had our immigration policies been more welcoming to skilled people? American citizens like Bill Gates, Sergey Brin and Mark Zuckerberg made brave decisions to drop out of school and start some of the most successful companies in the history of the planet. As a former foreign doctoral student, I can attest that under current immigration policies, such decisions are not easy to make for foreign students. For noncitizens trying to create a foothold in this country, it is virtually impossible to take the risks that these remarkable people took. With no clear path to citizenship, talented entrepreneurs who are foreign-born find it very risky to start businesses. Their options are limited to taking a salaried position with an employer who could sponsor their visa, or to marry an American. Our policies could be revised to promote entrepreneurial risk-taking by the top talent regardless of their country of origin, because just one Microsoft, or a Google or a Facebook, can change the world.

The blueprint offered by Senator Hatch and colleagues is full of sensible provisions, including work permits for spouses of H-1B workers. Talented people often meet and marry other educated, talented people, and having those productive spouses sit at home is a dead-weight loss to the United States economy. Residents at any major university town in the country will recognize ads from over-qualified babysitters "informally" willing to look after your children.

This bill will receive predictable pushback with simplistic arguments from special interest groups worried about skilled migrants undercutting American wages. But as other research has shown, immigrants make a net positive contribution to the United States economy, as they create more jobs than they take away, and their presence increases income per worker in the United States. Arguments that skilled immigrants will displace American workers, and thereby prevent young Americans from pursuing degrees in science, fail to recognize that entrepreneurs and innovators start new companies and invent new products that employ more skilled workers. Do we really believe that people like Sergey Brin or Albert Einstein took away more jobs than they created? Or that Facebook, Instagram or exciting new product lines from Google or Microsoft do not attract more young Americans to science

If skilled foreigners getting stuck to their visa sponsors in indentured low-wage work is a concern, then visa policies should be reformed to allow foreign-born entrepreneurs the flexibility to start their own businesses, not to pursue policies that keep them from our shores. Indeed, the White House's proposal for immigration reform includes such a provision for a "start-up visa" for foreign-born entrepreneurs.

Another counterargument to high-skilled immigration involves the concept of "brain drain" - worries that by attracting talent here, we are taking away the best and the brightest from other countries that have greater need for that talent. The fact is, these immigrants typically contribute more to their countries of origin than people who are prevented from leaving at all. This is because of the tremendously higher productivity of workers educated in the United States. Labor is the second largest export from Bangladesh, the country where I was born, and remittances account for over 10

percent of our gross domestic product. I, like many other first-generation immigrants, have continued contributing to the development of my country of birth, by combining the skills I acquired in the United States with my context-specific knowledge to pursue research and policies that address some of the key public health and development challenges in Bangladesh. One project demonstrates, for example, that promoting internal (rural to urban) seasonal migration is a very cost-effective way to counter a recurring pre-harvest famine.

The internal migration strategy works because it creates a better match between where people are and where the complementary inputs (capital, jobs) are during certain seasons, and this leads to enhanced efficiency and productivity. Attracting talented people to the United States and allowing them to interact with the innovative universities and companies creates similar efficiency gains that can be a win-win for the source countries and for the United States.