

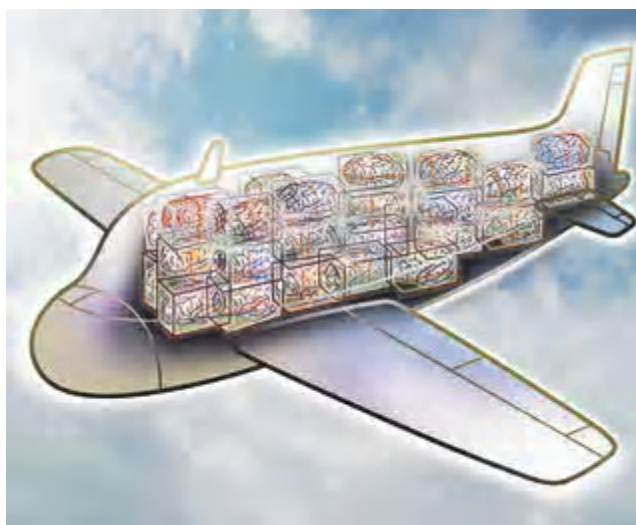
Economics focus**Give me your scientists...**

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Restricting the immigration of highly skilled workers will hurt America's ability to innovate

Illustration by Jac Depczyk



JOE BIDEN, America's new vice-president, is prone to gaffes. In 2006 it was the turn of some Americans of Asian descent to take offence at his comment about needing "a slight Indian accent" to go to a 7-Eleven or a Dunkin' Donuts in Delaware. Mr Biden's defence was that he was trying to compliment the immigrant group on its entrepreneurial zeal.

Many Americans are less favourably disposed towards immigrants. And rising unemployment is hardening attitudes. In the hubbub over the insertion of "Buy American" provisions into President Obama's fiscal-stimulus package, the Grassley-Sanders amendment was largely overlooked. This restricts the freedom of recipients of federal bail-out money to hire high-skilled foreign workers under the government's H-1B visa programme. Some people were delighted at what they saw as a significant, if small, first step in cracking down on those who they fear crowd skilled American workers out of the workplace. But others contend that such restrictions could dull America's edge in innovation, just when it is needed to help revive the economy.

Mr Obama says that part of the solution to America's economic problems should come from its universities and research laboratories. Yet these institutions in America are now manned disproportionately by immigrants, who made up 47% of scientists and engineers in America with PhDs, according to the 2000 census. Immigrants accounted for two-thirds of the net addition to America's stock of such workers between 1995 and 2006. Their role in innovation may seem obvious: the more clever people there are, the more ideas are likely to flourish, especially if they can be commercialised. But although contemporary theories of growth emphasise the importance of ideas, they assign no special role to immigration. Economists have tended to think of innovation as driven by the demand for better goods, which generates a need for skilled innovators. People's choices of career and education should respond to the labour market's demands, encouraging more of them to become innovators if needed. But

because career choices cannot be expected to adjust instantly, there might be scope for skilled immigrants to fill the gap.

Addressing these issues requires data on just how inventive immigrants are, a question that until recently was the province of educated guesswork. But William Kerr, an economist at Harvard Business School, used name-matching software to identify the ethnicity of each of the 8m scientists who had acquired an American patent since 1975. He found that the share of patents awarded to scientists born in America fell between 1975 and 2004. The share of all patents given to scientists of Chinese and Indian descent living in America more than tripled, from 4.1% in the second half of the 1970s to 13.9% in the years between 2000 and 2004. Nearly 40% of patents filed in 2005 by Intel, a silicon-chip maker, were for work done by people of Chinese or Indian origin. Some of these patents may have been awarded to American-born children of earlier migrants, but Mr Kerr reckons that most changes over time arise from fresh immigration.

What of the criticism that these workers are displacing native scientists who would have been just as inventive? To address this, Mr Kerr and William Lincoln, an economist at the University of Michigan, used data on how patents responded to periodic changes in the number of H-1B entrants. If immigrants were merely displacing natives, increases in the H-1B quota should not have led to increases in innovation. But Messrs Kerr and Lincoln found* that when the federal government increased the number of people allowed in under the programme by 10%, total patenting increased by around 2% in the short run. This was driven mainly by more patenting by immigrant scientists. But even patenting by native scientists increased slightly, rather than decreasing as proponents of crowding out would have predicted. If anything, immigrants seemed to "crowd in" native innovation, perhaps because ideas feed off each other. Economists think of knowledge, unlike physical goods, as "non-rival": use by one person does not necessarily preclude use by others.

...and your huddled mathematicians

But does all this emigration from the developing world harm the originating countries' capacity for innovation? A new paper** uses data on the patents cited by scientists working in India in their applications to America's patent office. It finds that proximity does matter: Indian patent applicants refer to research by people in India much more often than they cite work by those elsewhere. In that sense, having many scientists leave India does harm innovation there. But Indian researchers also refer to scientists of Indian origin in America more than very similar work by scientists with whom they do not share ethnic ties. So a scientific diaspora gives countries of origin a leg-up in terms of access to the latest research, mitigating some of the problems of a "brain drain". And given that the same scientist is likely to be more productive in America than in a developing country because of better facilities and more resources, immigration may help overall innovation (some of the benefits of which may flow back to firms in poorer countries).

Over time, knowledge flows between countries, and innovations in one place may benefit people elsewhere. So in the long run it may not matter where research takes place. Nonetheless, innovation benefits from clusters. Until there are Silicon Valleys all over the place, the world (and not just America) would be better off if American firms could hire the best people regardless of where they come from.

* William Kerr and William Lincoln, "The Supply Side of Innovation: H1-B Visa Reform and US Ethnic Innovation". HBS Working paper 09-005, December 2008.

** Ajay Agrawal, Devesh Kapur and John McHale, "Brain Drain or Brain Bank? The Impact of Skilled Emigration on Poor-Country Innovation". NBER Working paper No. 14592, December 2008.