Immigration's Role in the U.S. Computer Industry

Bottom line: lower salaries, other cost savings

by Norman Matloff

Americans tell their children, "If you study hard, go to college, and major in a professional field, you will have a reasonable chance for a fine career." Yet such words have a hollow ring for Cindy, a computer programmer who did all the right things and yet in 1994 found herself cast aside, unemployable, at the age of 35. (All persons identified here by only a given name or only a surname have had their names changed to protect their privacy.)

Cindy has been unable to find work as a computer programmer since being laid off by a major firm in Silicon Valley. Yet the same employers who reject her are filling their programming jobs with foreign nationals. The employers, whose public relations experts have heavily lobbied Congress against tightening of skills-based immigration policies, say that Cindy's skills are outdated.

Sharon Gadberry, president of Transitions Management/Outplacement National notes that job ads will specify five years of experience — "they usually mean no more than that." She explains that "companies are trying to screen out the older workers." A major motivation appears to be that fresh graduates are cheaper, with foreign nationals being the cheapest of all. A statistical analysis performed by the author on the 1990 Census data revealed that average salaries for foreign-born computer professionals in Silicon Valley were nearly $7,000 lower than among natives of the same age and level of education.

The industry's claim that the issue is skills, not salary, is unwarranted. Even Bill Gates of Microsoft says that general programming talent is far more important than background with a specific software technology. (See his quote in the point-by-point summary below.)

The issues here go directly to the middle class' growing feeling that the American Dream is no longer within reach. According to a November 27, 1995 poll in the *San Francisco Chronicle*, a prime worry among Californians today is that there will be no jobs for their children when they grow up. How can we implore our computer science students to study hard today, knowing that they, too, are likely to be discarded a few years from now — like Cindy? Even the foreign nationals are victims. Assuming they gain immigrant status, as is typical, then five or 10 years from now, the same "special skills" for which they are hired today will be obsolete, and then these people too will become victims of this throwaway-worker Ponzi scheme.

A quick summary of the situation is as follows.

Item: The computer industry does not need to hire large numbers of foreign nationals, either for the sake of quantity or quality:

- There is a labor surplus in the field.
- The vast majority of major technical advances made in the industry have been made by U.S. natives, not immigrants.

Item: The large number of foreign nationals being hired is due to these main factors:

- Some unscrupulous employers wish to save on salary costs, and foreign nationals, in exchange for a green card, are willing to work for lower salaries.
- Some sincere but misguided employers have placed an unwarranted emphasis on hiring people with very highly specific skill sets, thus creating an artificial labor "shortage."
- Some well-meaning employers wish to save on

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salary costs, by hiring mainly young new college graduates instead of mid-career people. When they run out of young domestic workers, they turn to young foreign workers, rather than to domestic mid-career people.

• Ethnic social networks have led to some company divisions — or in the case of small firms, entire companies — hiring almost exclusively from a certain ethnic group, such as Chinese or Indian.

In 1995 and early 1996, when Congress was considering legislation which would have tightened the laws under which U.S. employers can hire foreign nationals and sponsor them for immigration, industry lobbyists used a number of arguments in opposition. Following is a summary of those arguments, and our responses to them.

Note: Senator Alan Simpson, author of legislation to reform skills-based immigration, eventually withdrew the legislation, complaining that "I was working with the business community … to address their concerns, [but] each time we resolved one, they became more creative, more novel. [The lobbyists] distorted everything we were up to, everything."

Industry claim: Immigrants are vital to the American computer industry's ability to maintain its technological edge.

Our response: The vast majority of technological advances in the computer field have been made by U.S. natives. This can be seen in rough form, for example, in the fact that of the 56 awards given for industrial innovation by the Association for Computing Machinery, only one recipient has been an immigrant. Of 115 U.S. recipients of computer-related awards given by the Institute of Electrical and Electronic Engineers, only nine of the recipients have been immigrants. We should definitely encourage and facilitate the immigration of those who have extraordinary talent, but most of the immigrants in the industry do not fall into this category.

Industry claim: Pages and pages of computer job ads in major newspapers prove that there is a shortage of programmers with the skills employers need. That is why employers turn to hiring foreign nationals.

Our response: Employers are over-defining these jobs, insisting that applicants have skills in X and Y and Z and W and so on. But what really counts in programming jobs is general programming talent, not experience with specific software skills. Even Bill Gates has described Microsoft hiring criteria thusly:

> *We're not looking for any specific knowledge because things change so fast, and it's easy to learn stuff. You've got to have an excitement about software, a certain intelligence...It's not the specific knowledge that counts."*

"The vast majority of technological advances in the computer field have been made by U.S. natives."

Studies show that programmers can become productive in a new software technology in a month or so (this is confirmed by my own personal experience in 25 years of keeping up with technological change in the industry). Thus employers are (some deliberately, some unwittingly) creating an artificial labor "shortage."

Industry claim: The shortage is so acute that we have taken to placing job ads on highway billboards, even banners from airplanes flying over Silicon Valley.

Our response: As mentioned above, there is no shortage of professionals in the field. Employers receive huge numbers of resumes but only a small proportion of them result in interviews. This is hardly a picture of desperation. If there were a real shortage, employers simply could not afford to be so picky.

Industry claim: The industry needs to hire recent graduates, shunting aside many mid-career professionals, as the recent graduates are the only ones who have up-to-date skills.

Our response: As noted above, what counts is general programming talent, not highly-specific skills. New skills can be learned quickly. Many employers like the recent graduates not for their skills, but rather because they are cheaper, with foreign nationals being even cheaper still. And whether sincere or not, industry employers who follow such a policy are operating a Ponzi scheme, since software technologies change incredibly fast. If one hires young graduates because they have specific skills, they will be cast aside in a few years when those same skills become obsolete. The comments by

employers regarding new graduates are tantamount to an admission of rampant age discrimination, as is the point made by employment agent Gadberry above. This will produce less and less incentive for young people to enter the field in the future.

Industry claim: If a mid-career programmer cannot find a job, it is his/her own fault, for not keeping his/her skills up to date.

Our response: Take for example the C++ programming language, which is a requirement for many new jobs these days. C++ is an extension of the C language which most programmers use, and is easily learned. A programmer could take a course in C++ at a local community college, or just learn it on his/her own PC at home. But no employer would hire on this basis. Except for new graduates, employers insist on actual work experience in the given skill set.

Industry claim: The computer industry pays immigrants the same as it does natives.

Our response: Sun Microsystems, for instance, has heavily lobbied Congress against reform, saying that it needs to scour the world in order to hire the best and the brightest, but it seems more interested in hiring the cheapest. It has even publicly boasted that it hired 50 programmers in Russia "at bargain prices." As was noted earlier, average salaries for foreign-born computer professionals in Silicon Valley were nearly $7,000 lower than among natives of the same age and level of education. Even greater disparities, approaching 30 percent, were found for engineering in general by UCLA Asian American Studies professor Paul Ong — a prominent immi-grant advocate — who commented, "Companies took advantage of immigrants." Furthermore, by concentrating on hiring young recent graduates, even employers who give equal wages to domestic and immigrant workers are saving money, since the younger workers are cheaper. When they run out of new domestic graduates, they hire new foreign graduates, ignoring the experienced domestic workers.

Industry claim: Many jobs in the industry pay very high salaries, sometimes even paying bonuses to induce workers to accept job offers. This demonstrates that the hiring of foreign nationals is not having an adverse impact on wages for domestic workers.

Our response: As noted earlier, employers are over-defining job requirements, with ads like "Must have five years of experience writing C++ code for TCP/IP applications on SPARC platforms." The pool of programmers satisfying such conditions is of course small, thus raising salaries for those within that narrow pool. Yet as the Gates quote above illustrates, such pools are artificially narrow, since such tight job requirements are unwarranted. And as William Schroeder, CEO of Diamond Multimedia Systems has pointed out, these artificially high salaries then further increase incentives for employers to hire cheaper foreign nationals. Overall,

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engineering salaries have decreased relative to inflation, according to the American Association of Engineering Societies.

Industry claim: Unemployment among computer professionals is low, thus proving the employers' claim of a labor shortage.

Our response: People still must make a living, and thus must settle for taking whatever kind of job they can find. Many domestic computer programmers are underemployed — working in, say, computer customer interface jobs instead of programming, or in jobs which are completely unrelated to computers. Also, a number of them are forced to do temp work when they cannot find permanent jobs. Thus unemployment statistics are not very meaningful.

Industry claim: Half of the Ph.D.'s in computer science at American universities are going to foreign students, who are then hired by American employers after graduation and put into research positions.

Our response: Experts agree that America is overproducing Ph.D.'s, both foreign and domestic. These doctorate holders may well find jobs, but the jobs do not require Ph.D. training. Bill Gates of Microsoft does not even have a Bachelor's degree,

much less a Ph.D. I have no formal training in computer science (my Ph.D. is in mathematics), and yet I have been both a software developer in industry and a computer science researcher in academe.

Industry claim: Silicon Valley employers need to hire personnel for a project immediately, so they hire foreign nationals if they cannot find domestic workers quickly.

Our response: The employers admit that most of the foreign nationals they hire are foreign students who have recently graduated from American universities. Typically the hiring is done in the middle of a semester, so the employer needs to wait several months before the foreign national starts work. Thus the industry is contradicting its own claim.

Industry claim: Not enough domestic students are studying science and mathematics in primary and secondary school, and thus we have a shortage of trained engineers and computer programmers.

Our response: It is true that the number of new graduates in these fields has fluctuated, but we have not had a shortage. SoftPac, of Austin, Texas, found that during 1990-1993 — the period of lowest production of new graduates in these fields — there were 525,000 workers trained in engineering and programming and available for work but there were only 378,000 job openings. That surplus did lead to a decline in college enrollment in these fields, but that has now reversed; enrollment in computer science was up 40 percent nationwide in 1996. (By the way, while mathematics is used in engineering, it is not used in computer programming.)

Industry claim: Given its success, the industry must know best whom to hire. Natural market forces will result in the best people being hired.

Our response: Since most employers use the same hiring policies, a poor policy does not give any of them a competitive disadvantage. Indeed, market theory seems to fail in the industry. Studies have shown that programmers who are twice as productive are paid only 10% more. Intel leads the processor-chip market by far, yet its chip is widely regarded as poorly designed, as noted in Bill Gates' famous remark that “the Intel chip is brain damaged.”

Industry claim: True, there have been some abuses of laws allowing employers to hire foreign workers, but the offenders here have been small, unknown “body shops,” not the big companies in the industry.

Our response: Sun Microsystems, which we noted above had boasted of hiring Russian programmers at “bargain prices,” is one of the most prominent companies in the industry. Hewlett-Packard, another giant in the industry, admitted under oath in court that the cheap programmers it had imported from India were of inferior quality. General Dynamics, a prominent engineering company, hired engineers from Britain whose agents described them as being attractive due to the “indentured” (i.e. exploitable) nature of their visa status.

Industry claim: The industry already has strong disincentives against hiring foreign nationals, as the legal costs to obtain the visas are so high.

Our response: One can get approval from the Department of Labor to hire a foreign national on an H-1B visa for simply the price of the phone call made when one faxes in the application. More work is required for INS transactions, but economies of scale make this cost very low for the larger employers. Many of the smaller employers require the employee to pay the legal costs him/herself.

Industry claim: Company X employs a large number of immigrant engineers from country Y. This proves the need for immigrants.

Our response: This is a negative, not the positive point implied in the claim. It reflects networked hiring among an immigrant ethnicity, with the result that natives (as well as immigrants of the “wrong” ethnicity) are not being given access to these jobs.

Industry claim: Company Z was founded by an immigrant. This proves the need for immigrants in the industry.

Our response: The fact that a company was founded by an immigrant does not imply that if it were not for this immigrant, this sector of the industry would not exist. Again, we should facilitate the immigration of engineers of extraordinary talent, such as An Wang, founder of Wang Laboratories. But generally the immigrant entrepreneurs have not played pivotal roles in the industry's technological development. Furthermore, if foreign nationals wish to start companies in the U.S., they can do so via investors’ immigrant visas; it is not necessary to have a large quota in the skilled-immigrant visa categories for this purpose. TSC