

Intersections of Information Technology and Human Mobility: Globalization vs. Homeland Security

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Introduction

Analysts routinely list the rapid spread of information technology and the expansion of international migration as major factors driving globalization (See e.g. Held et. al. 1999; Sassen and Appiah 1999). I argue that international migration and information technology are not only two prominent features of globalization, they are becoming increasingly intertwined.

Revolutionary changes in information technology (IT) drive the economic globalization that is undermining state sovereignty (see e.g., Mathews 1997; Korbin 1997; 1998; Diebert 1997; 2000) and thereby challenges states' efforts to control immigration (Sassen 1996). Increasing "unwanted" migration of illegal migrant workers and asylum seekers has been considered evidence of the inability of states to control their borders (Cornelius, Hollifield and Martin 1994) and, when combined with migrants' successful claims to rights under international law, the decline of state sovereignty and the ascendance of post-national membership (Soysal 1994; Jacobson 1996). In the other direction, international migration has fueled development of new information technologies upon which the "new economy" rests by funneling computer scientists, graduate students and high technology workers from around the world to the centers of information technology industries such as Silicon Valley (Vasegh-Daneshvary 1987; Zachary 2000; Saxenian 2002). Foreign-born IT researchers and workers have subsequently become entrepreneurs who have started businesses not only in host countries (Saxenian and Edulbehran 1998) but increasingly in their home countries, as rise of Indian IT companies such as Tata, Infosys, Wipro and Cognizant has demonstrated.

The intensifying interrelationship between migration and information technology took a fateful turn when the September 11, 2001 terrorist attacks on the World Trade Center and the Pentagon starkly revealed a dark side of globalization. The attacks exposed the security

consequences of growing migration and travel flows as terrorists use the same modalities of travel document fraud and visa abuse characteristic of illegal migration to the U.S. The 19 hijackers entered on tourist and student visas but several hijackers traveled with altered passports, one of the hijackers entered with a student visa but never showed up for class, three had stayed in the U.S. after their visas expired and several purchased fraudulent documents on the black market that primarily services illegal migrants.¹ In the aftermath of the attacks, it has become clear that controlling borders in the information age of intensifying globalization involves a delicate balance of identifying and intercepting drugs, weapons, illegal migrants and terrorists without excessively hindering trade, cross-border production, migration, business travel and tourism upon which economic growth increasingly depends.²

In response to the attacks and cognizant of the economic ramifications of intensified border control actions in response to the attacks, the Bush Administration announced an initiative to create the “Smart Border of the Future.” According to a White House statement: “The border of the future must integrate actions abroad to screen goods and people prior to their arrival in sovereign U.S. territory, and inspections at the border and measures within the United States to ensure compliance with entry and import permits.... Agreements with our neighbors, major trading partners, and private industry will allow extensive pre-screening of low-risk traffic, thereby allowing limited assets to focus attention on high-risk traffic. The use of advanced technology to track the movement of cargo and the entry and exit of individuals is essential to the task of managing the movement of hundreds of millions of individuals, conveyances, and vehicles” (White House 2002). The “Smart Borders” initiative is the latest

¹ See Ziglar 2001 and the 9-11 Commission staff statement on the entry of the 9/11 hijackers (911 Commission 2003)

example of how the United States and other advanced industrialized countries have been attempting to selectively control migration using new information technologies (IT) in order to shape flows of human capital to the needs of technology-driven economies.

That is, many migrant receiving states have embarked upon an implicit, if not explicit, strategy to increase the ranks of high-tech workers while limiting inflows of “unwanted” illegal migrant workers and asylum seekers as well as intercepting terrorists. For example, in the mid-1990s, U.S. policymakers considered explicit selective migration strategies advocated by academics (Borjas 1990) policy think tanks (Papademetriou and Yale-Loehr 1996) and non-partisan, government-sponsored commissions but failed to follow through with necessary legislation. The U.S. Commission on Immigration Reform, chaired by former Congresswoman Barbara Jordan recommended that “Unless there is a compelling national interest to do otherwise, immigrants should be chosen on the basis of the skills they contribute to the U.S. economy. The Commission believes that admission of nuclear family members and refugees provide such a compelling national interest. Reunification of adult children and siblings of adult citizens solely because of their family relationship is not as compelling” (Jordan Commission 1995: xix). The Commission further recommended that the category for admission of unskilled workers be eliminated and that, “Immigration policy can contribute to this national interest by: Focusing on the admission of highly-skilled individuals; Giving employers access to a global labor market when they cannot identify U.S. workers with knowledge and expertise required for a specific job or when they demonstrate a labor shortage that cannot be filled through short-term training programs” (Jordan Commission 1995: xx-xxi). Although Congress considered this explicit selective migration strategy during the mid-1990s, legislative provisions for altering

² In this regard, see Flynn 2000, and the report of the Hart-Rudman Commission (2001, 13) to which Dr. Flynn was

legal immigration policy were split off from those directed at illegal migration and only the latter were enacted into law.³ Nevertheless legislation expanding temporary high-skilled migration was enacted, thereby putting a more implicit selective migration strategy into play.

Moreover, states have been using new border control information technologies that both facilitate as well as enforce the selective migration strategy. For example, in the 1990s the U.S. Immigration and Naturalization Service linked databases to hand geometry biometric identification systems in order to allow frequent flying corporate executives and high-tech professionals to whisk past airport passport control lines at the same time as it is set up remote sensors on the border to stop clandestine crossings of illegal migrants who were increasingly aided by smugglers.

The explicit or implicit pursuit of a selective migration strategy is evidence for the development of a new form of mercantilism for the “new economy” based on competitive importation of human capital. A global online market for high tech workers has helped enable the new economy mercantilism of receiving states, as has the changing development strategies of sending states that have shed fears of “brain drains” for hopes of remittances from skilled workers who can more easily stay in touch with their homelands using new technologies.

The September 11th attacks raised serious questions over the effectiveness of border control IT and the future of active recruitment of students and IT workers from abroad but it appears that the selective migration strategy remains intact despite Sept. 11th. The problem, however, is that the selective migration strategy of inviting the well-to-do and well-educated in while keeping the poor out does not necessarily increase homeland security, no matter how

a consultant. Also see Andreas and Snyder 2000.

³ Illegal Immigration Reform and Immigrant Responsibility Act of 1996, U.S. Congressional Record – House, September 28, 1996.

robust the border control information technology used to support it. Even if the information technology outlined in the Smart Borders initiative had been fully operational before September 11th, it is unlikely that it would have stopped the hijackers. The criterion for exclusion has been whether or not an individual entering the country is likely to work illegally or stay in the U.S. after his or her visa has expired. Fifteen of the nineteen highjackers were Saudi nationals and the vast majority of Saudi nationals applying for U.S. visas before September 11th were not interviewed because Saudis generally have sufficient financial resources so that they were not deemed high risk – high risk to stay and work illegally in the U.S. that is. The problem is that the rich can be dangerous. Hence, the selective migration strategy based on the criteria of wealth and skills comes into conflict with screening criteria for homeland security, which, ideally, should be based on intelligence assessments but are, in practice, often based on national origin, religious affiliation and political activities.

This position paper sketches out a broader research project that, in essence, examines the impact of the information revolution on international migration and the role of migration in the development of information technology with a focus on the political tensions between economic globalization and the imperatives of homeland security. I am currently devoting the bulk of my efforts to research on United States government deployments of border control information technologies in order to increase homeland security as well as high-skilled and student migration into the United States. Eventually, I would like to extend my research into a broader comparative examination of how EU member states, such as Germany, U.K. and Ireland, EU applicant states, such as the Czech Republic as well as classic immigration states such as Canada, Australia and New Zealand, have been using new information technologies in order to shape migration flows in favor of high-skilled migration.

In order to elaborate on these issues in the pages that follow, I will examine recent debates over globalization and international migration and argue for a great consideration of the factor of the information revolution. Second, I demonstrate the growing importance of information technology to migration control with a brief case study of U.S. deployment of an entry-exit tracking system. Third, I provide a brief overview of the competitive recruitment of human capital through policies designed to increase skilled migration.

Globalization, Migration and Border Control

Economic globalization has largely been enabled by the fundamental technological changes that have drastically reduced the cost of communication and transportation (Korbin 1997). For example, since 1945, average ocean freight costs have dropped 50 percent, air transport by 80 percent and transatlantic telephone calls by 99 percent (Auguste 1998, 16). With respect to migration and border control, the major debate in the economic literature has revolved around the question of whether or not globalization in the form of increased trade and capital flows increases or decreases international migration -- border controls rarely enter into the discussion. In contrast, the debates in political science are primarily focused on whether or not globalization undermines the ability of states to control their borders -- border controls are generally considered crucial factors in determining migration flows. Relative economic differences among different parts of the world may provide background conditions for explaining very general migration patterns, however, they are not fine-grained enough to explain migration between individual states due to sociological factors like transnational social networks, the political factors of immigration policies and border controls and the changing information technology environment in which these factors operate.

According to neo-classical economic theory, the liberalization of international capital markets, which has become the hallmark of globalization, should decrease migration (see, e.g., Weintraub and Stolp 1987; Layard, Blanchard, Dornbusch, and Krugman 1992, chapter 1). Recent trends, however, have not always followed neo-classical logic. For example, large-scale direct investment by U.S. companies in South Korea, Taiwan and China was accompanied by an increase in migration from these East Asian countries to the U.S. rather than a decrease (Sassen 1988). Increased investment in developing countries and increased trade often have the reverse effect, at least for the immediate term, as has been the case with illegal migration to the U.S. from Mexico (Massey 1998).

Following neo-classical economic theory, out-migration should be highest from the ranks of the unemployed in states with the lowest wages and it should flow to the states with the lowest unemployment rates and the highest wages. Sociological studies indicate that those who in fact migrate are generally not the poorest within sending states and they do not necessarily go where they could earn the most. Sociologists have demonstrated through detailed case studies that transnational social networks are the best predictors of migratory flows (see Massey et. al. 1993; Portes and Rumbaut 1996). Very simply: migrants tend to go to where their relatives and friends are. International migration is not simply a function of the demand and supply of labor across states but is more often determined by the support networks migrants have available to provide advice in dealing with immigration authorities, housing upon arrival, connections to employers and introductions to future spouses.

If economists have been primarily focused on whether or not globalization will increase international migration, political scientists have focused on whether economic globalization is

undermining state sovereignty as expressed in state control of borders.⁴ The debates over whether or not states can control their borders with respect to “unwanted” economic migration and asylum seeking has largely been framed in terms of the state as a strong but reluctant border enforcer confronted by individuals each trying to defy state controls (see, e.g., Cornelius, Hollifield and Martin 1994; Freeman 1994; Hollifield 1998). The problem with such state-centric framing of this debate is that it tends to miss the role of non-state actors, which may be used by the state to extend and increase migration controls beyond national borders, i.e., “remote controls,” (Zolberg 1998), as in the case of airlines that check travel documents (Lahav and Guiraudon 1997; Lahav 1998) and send passenger data to border authorities at the flight’s destination (Koslowski 2004). The problem with viewing migrants as individual actors, for instance, as cost/benefit maximizers responding to economic push/pull factors (Weintraub and Stolp 1987; Layard et. al. 1992), is that it tends toward atomistic depictions of migrants as objects to be controlled by the state.

To the contrary, the unwanted migrant is not simply an object of state control and his or her crossing of an international border is not necessarily the product solely of his or her own efforts. Just as states deputize private sector actors to enforce tougher migration controls and thereby change “the gatekeepers” (Lahav 1998: 680) that confront the prospective migrant, migrants are increasingly employing non-state actors, smugglers, to foil restrictions imposed by states. The “gatecrashers” are being transformed from hapless peasants who may have never traveled abroad to teams of border crossers led by professionals (See Kyle and Koslowski 2001).

Drawing on the work of Ronald Diebert (1997), I suggest that these debates over migration control have also not fully taken account of the changing information technology

⁴ For an overview, see Hollifield 1998.

environment that global labor markets and border controls inhabit. Diebert demonstrates that the shift from parchment to printing created an information and communications environment conducive to the rise of a world order based on a system of sovereign nation-states. The current information revolution is producing a shift to a hypermedia environment, epitomized by the internet, that is more conducive to a world order of non-territorial institutions and overlapping authorities akin to the neo-medievalism described by Hedley Bull (1977).

In addition to transnational corporations and global financial markets, transnational diasporic communities and non-governmental organizations thrive in this information environment. Rapidly declining costs for international telephone service, fax, email, cellular phones and internet telephony have enabled emigrants to maintain contact with their families and friends in their homelands and thereby fostered the development of transnational social networks that facilitate migration. Satellite television and the internet spread images and information of different life possibilities elsewhere to people around the world. In this way, the information technologies that foster economic globalization have also altered the economic calculus of individuals as to whether or not they decide to migrate. When these information technologies are combined with lower transportation costs, particularly for air travel, migrants can more easily envision a temporary sojourn to work abroad with frequent visits back home, which, in turn, makes the decision to leave much easier. Hence, the information and transportation revolutions have enabled more temporary migration as opposed to the more permanent international migration typical of the 18th and 19th centuries.

New information technologies and declining communication and transportation costs have not only made it easier and cheaper for emigrants to maintain contact with their homelands, it has made it easier to send home money to family and participate in local economic

development. It has been estimated that all of the world's migrant workers⁵ collectively sent home approximately \$65.6 billion in 1989 and \$71.1 billion in 1990 (Stanton Russell 1992: 286, table 3; Martin 1992: 162-172). With gross international capital movements at the end of the 1980s estimated at approximately \$600 dollars per year (Turner 1991: 9, cited in Keohane and Milner 1996: 1), remittances represented over 10% of the overall total. It is important to note that official remittance statistics do not capture all of the flows of remittances through informal funds transfer (IFT) systems, such as "Hawala" operating in transnational Arab communities, "Fei-Ch'ien" among the Chinese, the Indian "Hundi," and Thai "Phei Kwan" among others (El-Qorchi 2002). Informal funds transfer systems have thrived in the changed communications environment in that transfers can be accomplished with a virtually costless international telephone call. Conducting business by international telephony was largely the preserve of large money center banks and large corporations until the advent of satellite telephone connections.

Remittances have had an increasingly growing impact on many individual developing countries as well as developing countries as a group. During the decade of the 1990s, total remittances received by developing countries as a group exceeded total official development assistance received and during the latter half of the 1990s, there was a yawning gap between growing remittances and stagnate development assistance (see table 1). As foreign aid does not keep up with population growth in poorer parts of the world, emigration has increasingly become an economic development strategy of a rapidly growing number of individuals and families.

⁵ From developed as well as developing countries.

Table 1
Workers' remittances in comparison with net official development assistance
(received by developing countries in billions of dollars)⁶

	1995	1996	1997	1998	1999	2000	2001
Remittances received	48.1	52.6	62.7	59.5	64.6	64.5	72.3
Assistance received	61.0	51.9	46.6	50.3	52.4	50.5	52.0
Difference	-12.9	.7	16.1	9.2	12.2	14.0	20.3

While neo-classical economic analysis often posits international trade and investment as substitutes for international migration, the equations usually do not take into account the potential economic benefits of emigration and remittances to families in developing countries. Growing foreign direct investment may increase the number of available jobs and decrease the wage differentials among developed and developing countries, however, it does not necessarily always translate into decreased migration because surplus disposable income often becomes “migration capital” used to pay for international travel and to pay for smugglers who increase the chance of a successful border crossing (Kyle and Dale 2001; Spener 2001, Singer and Massey 1999). For example, a large proportion of the Chinese who are smuggled into the U.S. are from Fujian province, a coastal province with one of China’s fastest growing regional economies (Liang and Ye 2001). Relative wage differentials between developed and less developed countries may be less indicative of the propensity to migrate than wealth differentials between families within villages – between those who have a member sending remittances from abroad and those that do not. New information technologies enable the rapid formation and proliferation of transnational social networks that in turn become conduits of both human and capital mobility. While most of the money and migrants may cross international borders legally, transnational social networks may also facilitate illegal migration and money transfers that support illicit activities.

⁶ Source: World Bank 2003, Statistical Appendix, tables A-19 and A-21, pp. 198, 200.

As Jessica Mathews (1997) paints it, networks of activists and NGOs quickly adopted new technologies used the internet and ran circles around lumbering hierarchical states. Not all NGOs, however, are concerned with human rights and the environment. Transnational criminal organizations and terrorist organizations are NGOs, too. Just as the information revolution has dramatically changed the playing field for the contests between states and human rights activists, it has also altered the contests between states and smugglers; between states and terrorists. Just as states are deploying high technology at their borders, smugglers are increasingly using the latest technologies money can buy (Koslowski 2000, 211-14). Increasingly sophisticated transnational criminal organizations use ever cheaper international telephone services, fax and cellular phones to arrange shipments, switch routes, confirm deliveries, etc., much as any legitimate import/export firm. Law enforcement tools such as wiretaps that determine the location of callers can be foiled by something as simple as a calling card, which can be purchased at a local convenience store, or more sophisticated “disposable” cell phones that use calling cards or “clone” cell phones. Smuggling fees that have gone as high as \$65,000 (Fujian, China to New York City) have been a boon to financing the research and development of high quality fraudulent documents (Stewart 1999). While states deploy video cameras along their borders, smugglers monitor border patrol radio frequencies, use cell phones and encrypted email to relay information to colleagues on rerouting migrants to avoid crossing points with built-up defenses. While states insert holograms and other security features into travel documents, smugglers, and the counterfeiters that they subcontract, use the same technologies to produce ever better fakes.

Increasing human smuggling is growing factor in shaping migration flows that in a sense is itself is a form of information exchange. Smugglers respond to border control efforts and

thereby make more decisions regarding where an increasing share of the world's migrants actually go (Salt and Stein 1997). Part of the smugglers' success in getting migrants across borders is the ability to change routes and destinations in order to overcome obstacles placed in their way by states. In a sense, the smugglers gather and process information about the weak links in terms of transportation systems, border controls, liberal visa and asylum policies and then they provide it to their customers. This ratchets up the pressure on receiving states to cooperate with each other and to adopt even more restrictivist border control and asylum policies lest their land borders, airports and harbors be targeted by smugglers as weak links (Koslowski 2001).

In as much as effective border control depends on increasing state deployment of IT to keep pace with smugglers and terrorists, the weak links that stand out are those states, ports of entry, airports, etc. that have not effectively modernized information systems used for operations, surveillance and law enforcement. Therefore, the competitive dynamic in the future may be less a matter of ever-stricter asylum and immigration policies but rather of larger IT budgets for border control and law enforcement agencies, better implementations of systems purchased and more interdepartmental and interagency information sharing. Moreover, the multilateral cooperation necessary to combat human smuggling and terrorism may move beyond harmonization of laws and policies and on to automated information exchanges among states' border control and law enforcement authorities (Koslowski 2004).

Using IT to control borders and manage migration

Some scholars have examined border control information technology in descriptions of the "militarization" of the border (Dunn 1996), in more nuanced analysis of the politics of border

control build-ups (see Andreas and Snyder 2000; Andreas 2001), in explaining the dynamics of border control and travel document fraud (Koslowski 2000; 2001) and in evaluating means of screening international trade flows (Koslowski and Flynn 2001). Nevertheless, the topic of border control IT has been rather obscure in academic studies of international relations, international migration and management information systems. Unfortunately, it took September 11th and a host of subsequent Congressional hearings and media coverage of the failure of student visa, entry-exit and data-sharing systems to change that. With few exceptions (Salter 2003) most post Sept 11th analysis of border control IT has primarily been conducted by computer industry consultants and specialized trade journals (e.g., GCN 2002; GovExec.com 2002) or defense and intelligence community analysts (e.g. Strickland and Jennifer Willard; Shinn and Lodal 2002; Anderson, Thompson, Wilhelm and Wogman 2004) and most of the policy analysis has focused on information sharing across the intelligence and law enforcement communities (Markle Foundation 2003) and its implications for privacy and civil rights (Markle Foundation 2002) rather than on border control functions.

In my larger research project, roughly half of my efforts are devoted to examining US deployments of information technology to control migration and screen for terrorists. I examine the use of information technology before entry for visa determination, pre-clearance, intelligence; at points of entry for surveillance along the border and inspections; internal tracking and enforcement; and finally for sharing data across the Department of Homeland Security. Given space and time constraints, I will focus on the deployment of an entry-exit system which cuts across several of the above phases of migration and border control as well as the complementary the use of biometrics in visas and machine-readable passports.

During the 1990s, the INS accelerated its purchases of information technologies. For example, in 1998 the INS awarded three IT contracts that totaled up to \$750 million over a 5-year period.⁷ Moreover, INS use of IT became an argument used by former INS Commissioner, Doris Meisner, to ward off members of Congress who sought to split up and reorganize the beleaguered agency (see Tillett 1997). In the wake of September 11th, budget requests for border control IT have increased dramatically with the Bush administration's 2003 budget including an increase of \$722 million for information technology specifically targeted on homeland security with over half of that earmarked for an entry-exit system (Bush 2002).

It has been estimated that there are now 9.6 million undocumented migrants in the U.S. (Passel, Capps, Fix 2004). Approximately 40% of the undocumented migrants in the U.S. entered legally but overstayed their visas. There are only rough estimates for the number of visa overstayers because U.S. immigration authorities do not register and count all of the people who leave the U.S. after they entered. Tracking all those who enter and exit the US is a daunting task. There were some 440 million entries in 2002 with 61 million citizens and 279 million non-citizens, which was down from the Sept. 11th figure of 500 million entries.

Section 110 of the U.S. Illegal Immigration Reform and Immigrant Responsibility Act of 1996 mandated that INS develop and automated entry-exit control system that would "Collect a record of every alien departing the United States and match the records of departure with the record of the alien's arrival in the United States"⁸ and to do so by the end of 1998. The Non-Immigrant Information System (NIIS) was deployed in order to automate entry and exit record databases to identify visa over-stayers but development and deployment of the system was

⁷ See "INS Moves Ahead With Innovative STARS Program-- Awards Three Major Technology Performance Contracts," INS press release, June 26, 1998 downloaded on Oct. 15, 2001 at <http://www.ins.usdoj.gov/graphics/publicaffairs/newsrels/stars.htm>

partial and repeatedly delayed. Congress pushed back the deadline for implementation of the law after lobbying by U.S. business groups from states bordering Canada. These groups pointed out that registering every person who crosses into the U.S. from Canada using even the most sophisticated smart card technology would still require several minutes to process each individual and this would back up traffic at the border for hours, especially at the Detroit – Windsor crossing. Up to 10 million vehicles annually cross the Ambassador Bridge between the Windsor, Ontario and Detroit, Michigan, along with 27% of U.S.-Canadian Merchandise trade.⁹ This was a particular sore point for the big three automakers given that their just-in-time production lines crossed the border. In 2000, full deployment of NIIS was effectively put on indefinite hold.

The visa tracking system that existed prior to Sept. 11, 2001 primarily covered passengers arriving by airplane and consisted of a paper form stamped at the port of entry, which is supposed to be returned to the airline upon departure and then entered manually into a database. Due to lost forms, incomplete data entry, entry and exit by land border and incomplete deployment of the system, there was no effective way of knowing if individuals have overstayed their visas – as was the case of several of the September 11th hijackers.

For example, an INS inspector at Miami International Airport stopped Mohamed Atta on January 10, 2001 when Atta said that he was planning to take flight lessons but was entering the country on a tourist visa rather than a vocational education visa. He was detained for additional questioning by another officer and after almost an hour he was released. Neither office noticed that he had overstayed his visa by over a month on his previous trip to the U.S. A former INS

⁸ Illegal Immigration Reform and Immigrant Responsibility Act of 1996, Section 110.a.1 Automated Entry-Exit Control System,” U.S. Congressional Record – House, September 28, 1996, p. H11787.

⁹ See <http://www.ambassadorbridge.com/facts.html>

officer, Patrick Pizarro, explained that the inspectors most likely missed Atta's overstay because they are under pressure allow to clear tourists as quickly as possible but ““You don't have all the information about every arriving passenger in one database,’ Pizarro said. ‘It's all scattered in various databases and it's time-consuming to find the information you need.’” (quoted in Chardy 2001). After September 11th, incoming passengers received greater scrutiny but, according to an INS inspector from Miami who appeared on CBS’ “60 Minutes,” against his supervisor’s wishes, the systems are down once or twice a week and passengers are being admitted without having been checked against the look out databases (CBS 2002).

In response to these failures, Congress passed and President Bush signed the Enhanced Border Security and Visa Entry Reform Act in 2002. The law mandates that an entry-exit system be in place at all air and seaports by the end of 2003; the 50 most highly trafficked land ports of entry by the end of 2004 and all ports of entry by the end of 2005.¹⁰ The Bush Administration’s 2003 budget allocates \$380 million for the implementation of this comprehensive entry-exist information system (Ziglar 2002) which has been re-launched as United States Visitor and Immigrant Status Indicator Technology (US-VISIT). In its first phase of implementation, US-VISIT collects digital photograph and fingerprint scan biometrics from those individuals traveling on a visa to the United States then runs watch list checks on the data collected.

In order to address the loopholes that allowed some members of al Qaeda to enter on U.S. visas, the State Department has begun requiring that those who need a visa to travel to the US apply in person at US embassies and consulates where a growing percentage of them have digital photos and finger scans taken as the State Department deploys the requisite technology across all

¹⁰ “Enhanced Border Security and Visa Entry Reform Act of 2002,’ Public Law 107–173, May 14, 2002.

its consulates. Following Congressional mandates all US visas must incorporate a biometric identifier by October 26, 2004, a combination of facial recognition and electronic fingerprint scanning was selected as “the most effective and least intrusive (Jacobs 2003).” A digital photograph and fingerprint scans will be taken of all visa applicants at US embassies and consulates and then these biometrics will be compared with biometrics collected upon arrival at the port of entry through the US-VISIT program.

The fundamental problem of the previously partially deployed entry-exit system still exists. A tracking system cannot determine who is in the country if the data are not complete. For example, a record of an entry may be entered in the database when someone enters by air, but if that person departs at a land border, a corresponding exit record is not registered. When asked, DHS staff in charge of inspections referred to land border exits and the capture exit data as a “work in progress” with no plans yet for staffing.¹¹ US-VISIT is very much a work in progress since the existing system is comprised of legacy INS systems and off-the-shelf applications that have been pulled together to meet Congressional deadlines. The prime contractor who is to develop US-VISIT will not be selected until May 2004.

The problem of physical infrastructure remains. It will be impossible to process incoming visitors and shipments without backing up traffic leading to gridlock on the Canadian side unless more bridges are built between Canada and the U.S. or large areas around either end of the bridges are cleared for secure areas in which many more inspection lanes are built, or remote inspection areas with secure corridors to the border are developed.

Political pressure was quickly applied to loosen security and get the trucks moving several days after Sept. 11, 2001 as it had been previously applied to squelch the entry-exit

¹¹ Response to author’s question at Customs and Border Protection’s Trade Symposium, Nov. 2003.

system that was mandated by the 1996 legislation passed in response to the first World Trade center bombing. After the US-VISIT program had been established, it was announced that for the time being Canadian nationals would be exempt from mandatory enrollment in US-VISIT. In response to Mexican objections of unequal treatment in comparison with the U.S.'s other NAFTA partner, the Bush administration proposed to exempt Mexican nationals with border crossing cards (so-called laser visas) that entitle holders to enter the U.S. and remain in the border region up to 25 miles into U.S. territory for up to 72 hours.

At this point, the requirement for biometric enrollment in US-VISIT upon entry does not apply to nationals of the 27 states in the U.S. Visa Waiver Program. The Visa Waiver Program permits entry into United States without a visa for a stay of up to 90 days. The criteria for membership in this program are that the country offers reciprocal privileges to U.S. nationals; the country has had a visa refusal rate of less than 3 percent for the previous year; that the Attorney General and Secretary of State determine that inclusion of the country does not compromise law enforcement interests, including either immigration or security interests (Becraft 2002). Additionally, the Enhanced Border Security and Visa Entry Reform Act conditions countries' participation on the issuance of machine-readable, tamper-resistant passports containing biometric data and sets a deadline of Oct 26, 2004. As envisioned, data from these biometric passports will then be automatically collected by US-VISIT upon entry without a separate digital photo and fingerprint scan.

The US Congress deferred to the International Civil Aviation Organization (ICAO) on setting the biometric standard and it was not until May 28, 2003 that the ICAO announced an agreement - facial recognition plus optional fingerprints and/or retina scans on a contactless integrated circuit (IC) chip (ICAO 2003). The contactless IC chip is part of a Radio Frequency

Identification (RFID) system in which data on the IC chip is transmitted via radio waves to a reader. A passport with a contactless IC chip can be read by the reader at a distance, therefore allowing faster transfer of data from the passport. As envisioned, holders of new biometric passports issued by Visa Waiver countries will give their passports to inspectors who will simply bring the passport close to the reader. The reader will capture the personal data and the digitized biometric. This information can then be checked against terrorist and law enforcement watch lists. If there are no hits, the inspector can then allow the traveler to continue on through passport control and enter into the US. Similarly, upon exiting within the 90-day limit of the Visa Waiver Program, the traveler will “check out” of the country with a wave of the passport over a reader, possibly even using a self-service kiosk. There are major obstacles to realizing this vision, especially by October 26, 2004, as mandated by Congress (for full details, see Koslowski 2004).

As of this writing, no Visa Waiver countries currently issue biometric passports meeting the ICAO standard. Few Visa Waiver Program countries will be able to meet the requirement of including biometrics in all new passports issued to their nationals from Oct. 26, 2004 onward. According to Assistant Secretary of State for Consular Affairs Maura Harty, the U.K., France, Germany, Ireland, Italy and Spain will not begin issuing passports with the ICAO standard facial recognition biometric by October 26, 2004. The UK has indicated that it will do so late 2005 while others may not do so until a year after that (Hartly 2004). If the US were to drop a current EU member state from the Visa Waiver program, that could trigger a chain of events in which the member state reciprocates and requires a visa of U.S. nationals and provision the EU’s common visa policy effectively end visa-free travel between the US and the EU (see Koslowski 2004).

While it is a distinct possibility that the US may drop EU member states from the visa waiver program, the prospects for this happening are unlikely because this course of action is very rather costly and problematic for both the US and the EU. In her response to questions posed at a January 2004 hearing of the National Commission on Terrorist Attacks Upon the United States, Hartly replied that the State Department has enough resources to put in place the infrastructure necessary to collect biometrics from those people currently required to travel with visas to the US. If the Visa Waiver Program were to be eliminated or if the US dropped several EU member states that send large numbers of travelers to the US, she acknowledged that the State Department could not process these additional visa applications. Not only would the State Department have to hire and train a large contingent of new consular officers, in many European countries acquiring the necessary space and physical infrastructure to interview and process visa applicants would take over a year – just about the time when these countries will have their new passports enabling them to once again meet the Visa Waiver Program requirements. In light of these realities, Ms. Hartly suggested that pushing the Oct. 26, 2004 deadline back would be the most financially and logistically realistic option (see Hartly 2004a). Indeed, Bush administration officials and Congressional staffers have formed a group to negotiate the terms of a deadline modification (Williams 2004).

High-Tech migration

While information technologies have been used to control migration across international borders, international migration has facilitated the development of information technologies of the “new economy” that have propelled globalization. To fuel the information revolution increasing the growth of their economies, the US, Canada, Australia, New Zealand, Germany,

Ireland, the U.K. and the Czech Republic have devised special visas and programs to attract highly skilled computer programmers and other IT professionals from developing countries such as India and China as well as East European countries and Russia. Moreover, a rapidly growing cyberspace of multiplying websites developed by these and other IT workers has globalized the market for skilled workers themselves as high tech job recruiting and placement has gone online.

The impact of international migration on the development of information technologies is displayed in the epicenter of the information revolution, Silicon Valley. For example, about a third of the valley's engineers are foreign born. Chinese and Indian immigrants to Silicon Valley alone have started some 2,700 companies since 1980, accounting for a sixth of the total sales seen in the valley in the last 20 years (Zachary 2000; Saxenian 2002). None other than Federal Reserve Chairman Alan Greenspan has argued that the 11 million immigrants who came during the 1990s have been crucial to sustaining the US' longest-ever economic boom.¹²

Largely due to the influence of the IT lobby, Congress passed the "American Competitiveness and Work Force Improvement Act" in 1998. This legislation increased the number of temporary employment (H-1B) visas from 65,000 to 115,000 per year for fiscal years 1999, 2000 and 2001. Under the H-1B program, employers sponsor workers for a three-year visa that is renewable to six years total. But the demand for H-1B visas outstripped the quota in the first year, prompting the IT industry to lobby again for more. In October 2000, President Clinton signed into law the "American Competitiveness in the Twenty-First Century Act," which increased the cap to 195,000 per year for three years.¹³

¹² See "Barbara Roche calls for fresh debate in immigration policy," U.K. Home Office Press Release of 11 September 2000, downloaded on Oct. 15, 2001 at:

<http://www.ind.homeoffice.gov.uk/news.asp?NewsId=5&SectionId=1>

¹³ See "American Competitiveness in the Twenty-First Century Act Policy Memo," INS Document downloaded Oct. 16, 2001 at: <http://www.ins.usdoj.gov/graphics/services/employerinfo/index.htm>

The role of the IT industry in immigration to the U.S. is highlighted in the changing demographics of the recipients of visas for temporary workers. According to Lindsay Lowell (2000), in 1989, education and non-profit science industries followed by health care and then entertainment were the top occupational categories for holders of temporary work visas. Of the H1-B visas granted in 1999, 53.3% were for systems analysts and programmers, 4.9% for electrical engineers, 3.4% for other computer occupations. Moreover, the major countries of origin had shifted dramatically as well. While Great Britain and the Philippines were the top countries of origin in 1989, Indian nationals received 55,047 of the 116,695 H-1 visas in issued in 1999. British high-skilled workers came in second with 6,665 and China third with 5,779. Lowell estimates that in 2000 there were a total of about 425,000 H-1B holders in the U.S. and that, with the increase in the cap to 195,000/year, the total population would most likely reach a bit over 700,000 in 2002 and then decrease as the cap returned to 65,000/year in 2003 down to about 270,000 by 2010. Many of those leaving their H-1B status within the six-year term do not necessarily leave the U.S. – rather between 20 and 50% of the H-1B visa holders adjusted their status to permanent resident alien (received a “green card”) every year over the past decade.

After the internet economy bubble popped, post-Sept 11th uncertainties over the economic and security environments reduced hiring of H1-B workers and foreign student enrollment in U.S. universities dropped off. Other countries were waiting with open arms for experienced high-tech workers leaving American shores and computer science and engineering students opting against study in the U.S. For some time now, Canada, Australia and New Zealand have had immigration policies based on point systems, in which desired skills count toward attaining permanent resident status. Additionally, the New Zealand Immigration Service has a special unit in India to help IT professionals interested in immigrating because as a

Regional Director, Arron Baker, explained “We are competing with Australia, Canada, Germany and other countries for skilled migrants” (Quoted in Parasher 2000).

In August 2000, the German government introduced the so-called “Green Card” for foreign IT workers in which up to 20,000 three to five-year work permits will be issued. The government argued that the program was necessary in order to keep pace with the American information technology industry and it explicitly targeted Indian programmers. In July 2001, German government announced plans to introduce legislation that would expand the numbers of temporary worker and trainee positions as well as introduce a Canadian-style point system for allowing foreigners to become permanent residents, however, after this legislation was passed by a razor thin margin in December 2001, it did not withstand a constitutional challenge by the opposition.

Soon after Germany initiated its Green Card program, the UK’s Immigration Minister, Barbara Roche made a speech in which she argued, “We are in competition for the brightest and best talents - the entrepreneurs, the scientists, the high technology specialists who make the global economy tick. In order to seize the opportunities of the knowledge economy, and to play a constructive part in shaping these huge changes, we need to explore carefully their implications for immigration policy.”¹⁴ Despite the September 11 attacks, in October 2001, U.K. Home Secretary David Blunkett announced the establishment of a Highly Skilled Migrant Programme designed to attract “highly mobile people with special talents that are required in a modern economy.” The program is operated on a point system and it provides one year permits that can

¹⁴ “Barbara Roche calls for fresh debate in immigration policy,” ,” U.K. Home Office Press Release of 11 September 2000, downloaded on Oct. 15, 2001 at: <http://www.ind.homeoffice.gov.uk/news.asp?NewsId=5&SectionId=1>

be renewed indefinitely. Blunkett anticipates that the program “will be a body blow to the people traffickers” because it will provide a legal way to come to the UK (MN 2002).

States are increasingly competing in the global marketplace for IT labor that has been created by the internet. Employers no longer simply advertise jobs in local or even national newspapers. Firms are increasingly using their websites to post openings and invite on-line applications. Firms and job seekers post opening and resumes on general job boards such as monster.com or IT specific boards such as computerjobs.com or dice.com, which are accessible from any internet café in any developing country. Often firms outsource the recruitment process to consulting agencies (called “job shops” or “body shops”) in order to obtain the services of programmers that will participate in limited duration projects. Contrary to impressions left by some press accounts (e.g. Cohn and Roche 2000), the term, “body shop” has long been used for IT consulting companies in general – not just those that recruit temporary foreign workers. Consulting agencies post position descriptions on job boards without identifying the employer, screen applicants and forward the resumes of promising candidates to the employer. Consulting agencies also have an abundant global supply of labor as they sift through resumes posted on job boards as well as use search engines and data mining tools to identify potential job candidates from around the world (Cornell 2001).

Changing policies in many developing countries have also facilitated the growth of a global IT labor market and led to competition among IT labor sending countries. In the 1960s and 70s, many migrant sending states were concerned about "brain drains" (Bhagwati and Partington 1976) and maintained mercantilist policies that penalized emigrants -- such as requiring payment for education received or military service before accepting an emigrant's renunciation of nationality. In the 1990s, sending states traded such fears for hopes of

remittances from skilled workers who can more easily stay in touch with their homelands using new technologies, thereby, leading economists to call for a “diaspora model” of development (Bhagwati 2003) and cooperative tax sharing between sending and receiving countries (Desai, Kapur and McHale 2001; 2002). By the 1990s, states such as South Korea, the Philippines and India were using public funds to establish technical schools and university programs whose graduates were expected to leave for work abroad. Generally wishing to minimize worker training for project-specific jobs, employers strive to recruit workers with precise skill sets that meet the needs of the project at hand. Since the demand for specific skills within IT labor markets can be ascertained through a content analysis of job postings on the internet, engineering and business schools anywhere in the world can identify which skills are in demand and adjust their curricula accordingly. While several Indian schools have proved especially good at this, schools in other countries are doing the same. Indeed, other states that export IT workers are growing increasingly competitive with India. This was highlighted when the “I love you” virus (which cost an estimated \$10 billion worth of damage) was traced back to the class project of a Filipino computer student. He was not arrested (because the Philippines did not have a law against hacking) but rather became a national hero for demonstrating the prowess of Filipino programmers.

Conclusion

The United States is using new information technologies to selectively control migration in order to maintain flows of high skilled workers and students while keeping out unwanted migrants and terrorists. This selective migration strategy, and the new form of mercantilism it represents, produces political tensions between the demand for high-skilled migration and the

imperatives of homeland security. The political tensions between tougher border controls and economic considerations were on public display during Fall 2003 Congressional hearings as Department of Homeland Security and State Department officials tried to reassure Congress that new security measures would not excessively impede business travel and tourism while Congress heard testimony of business representatives complaining of month-long waits for Korean business partners to receive visas, of a 45% drop in tourists from Brazil and the drop in foreign students which at \$12 billion/year is a major U.S. “export” (see U.S. Senate 2003).

U.S. policymakers must navigate between the competing pressures of economic globalization and homeland security, however, a strategy of inviting in the well-to-do and well-educated in while keeping the poor out does not necessarily increase homeland security, no matter how robust the border control information technology used to support it. The Saudi “visa express” program that enabled most Saudi nationals to get visas through their travel agents without an interview was shut down a year after Sept 11th and, in an effort to bolster homeland security, new regulations, screening procedures and technologies are in place to collect and facial and fingerprint biometrics of those traveling on visas to the U.S. Nevertheless, visas are primarily denied to applicants because they are immigration rather than security risks and the criteria for excluding migrants because they pose a risk of working and staying in the U.S. remains operative for the Visa Waiver Program. The economic basis for exclusion was demonstrated after the U.S. dropped Argentina from the Visa Waiver Program during its economic crises due to fears that large numbers of Argentine nationals would go to the U.S. seeking employment.

Despite new border and visa security laws and regulations, a double standard favoring nationals of rich countries persists in the requirements for biometric data collection. Radek

Sikorski, former Deputy Minister of Foreign Affairs and Deputy Minister of Defense, put the issue in sharp relief at a March 2004 panel discussion he organized. From the description of the event: “Citizens of countries that have supported America in Iraq are fingerprinted and photographed on arrival in the United States while visitors from countries where many radical Islamists reside--such as France and Germany--can enter without visas and without being fingerprinted. Should Americans apply the same standards to everyone?”¹⁵ The perceived double standard could be addressed if the US would require Visa Waiver Program countries to include fingerprint biometrics in addition to digital photographs in their passports. Stuart Verdery, Assistant Secretary for Policy and Planning at the Border and Transportation Security Directorate of the DHS noted that adding fingerprint biometrics would permit one-to-many checks against existing law enforcement fingerprint databases whereas there is as yet little in the way of equivalent facial recognition biometric databases.¹⁶

While Congress might move to close this security loophole, if the US were to require additional fingerprint biometrics in Visa Waiver country passports, Jonathan Faull, Director General for Justice and Home Affairs at the European Commission warned that EU member states would reciprocate and require fingerprints of US nationals.¹⁷ The US Congress, the State Department and the DHS have largely avoided the issue of collecting fingerprint biometrics from US citizens who wish to travel abroad and have only imposed the requirement on nationals of other states. Requiring a digital photo which is useful for one-to-one identity verification checks is much less politically charged than requiring collection of fingerprint biometrics which are

¹⁵ The description and a video of the event are at: http://www.aei.org/events/eventID.758.filter.all/event_detail.asp.

¹⁶ Response to author’s question posed after Mr. Verdery’s presentation at Fortress America? The Implications of Homeland Security on Transatlantic Relations,” American Enterprise Institute, March 4, 2004. http://www.aei.org/events/eventID.758.filter.all/event_detail.asp

much more useful for one-to-many checks against existing law enforcement databases. It is clear that in the post-September 11th environment, legislators, their constituents and administrators are willing to train those technologies on the foreigners entering their countries. It is not so clear that there is equivalent political will for accepting other states' use of the same technologies when they themselves are the "foreigners" subject to data submission requirements. In any event, the emerging political controversy over fingerprint biometrics is just one flashpoint of tensions generated by the collision between increasing international mobility and homeland security imperatives.

While this tension is played out in the politics of information technology deployments, U.S. immigration policies continue to implicitly follow the course of new economy mercantilism. President Bush's recent proposal to "match willing foreign workers with willing U.S. employers when no Americans can be found to fill the jobs" (White House 2004) is directed toward the millions of undocumented, mostly unskilled, and mostly Mexican migrant workers in the U.S. It seems to run counter to the selective migration strategy. The proposal, however, enunciates a set of principles to guide legislation including that should be non-sector specific and open to nationals of any country. Margaret Spellings, Assistant to the President for Domestic Policy, said that Indian computer programmers could apply and there is no annual limit to the number of applicants.¹⁸ The only requirement for employers would be that they must make reasonable efforts to give qualified U.S. workers the first opportunity to fill the position (such as posting the position on an on-line bulletin board for several weeks). There is no wage floor other

¹⁷ Response to author's question posed after Mr. Faull's presentation at "Fortress America? The Implications of Homeland Security on Transatlantic Relations," American Enterprise Institute, March 4, 2004.
http://www.aei.org/events/eventID.758,filter.all/event_detail.asp

¹⁸ Response to author's question posed to Ms. Spelling at "President Bush's Immigration Proposal: Too Much, Too Little, or About Right?" Policy Forum, Cato Institute, Friday, January 16, 2004.
<http://www.cato.org/events/040116pf.html>

than that imposed by minimum wage rules. Therefore, employers could post a job for a computer programmer at twice the going rate in India (but a fraction of the cost in the U.S.) and if no U.S. programmer applies at this wage, an applicant from India could receive a temporary work visa for the position.

A great irony of the contemporary situation is that as migrants compose a growing proportion of the IT industry workforce, there is a greater chance that the IT tools deployed by the Department of Homeland Security to control U.S. borders will be coded by an H-1B worker. Indeed, the lower costs of implementing off-the-shelf software, more of which is written by H-1B workers than the legacy systems coded in-house by U.S. Government employees, combined with system implementation by consulting firms that utilize H-1B workers could give the DHS “more bang for the buck” when purchasing information systems, database tools, sensors and surveillance systems used to keep out illegal migrant workers attempting to cross clandestinely into the U.S. or overstay their visas.

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