

Career Patterns of Foreign Born Scientists and Engineers Trained and or Working in the U.S.

Workshop Report

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January 2008

Introduction

The internationalization of science and engineering has transformed many debates concerning “brain drain” and brought increasing attention to concepts of global “brain circulation.” Yet, much of this discussion is often based on insufficient evidence about the actual flows of scientific workers among nations or the composition of the workforce as it relates to origin, both in terms of birth and training. With the support of a grant from the Alfred P. Sloan Foundation to Georgia State University, a workshop was held November 7, 2007 at the National Bureau of Economic Research, Cambridge, MA with the purpose of exploring various approaches for studying career patterns of foreign-born scientists and engineers trained and or working in the U.S. The co-organizers of the workshop were Richard Freeman, Paula Stephan and John Trumbour. The primary focus of the workshop was on methodological approaches to studying career patterns and the flow of talent across national borders. This is of crucial importance. Given that no one database covers individuals working in science and engineering world-wide, the approach used is often dictated by the question and population that one wishes to study. Moreover, because of issues related to confidentiality, it is often the case that existing data cannot always be used to examine questions related to the foreign-born or foreign-trained, regardless of location of work.

The workshop brought together 31 researchers from across the U.S. and Europe doing work in the area. A particular strength of the workshop was that it convened a group of individuals with common interests but who in many instances were unfamiliar with each other’s work, in part because of the different disciplines and institutions from which the group was drawn. A list of the individuals attending the workshop is appended to this report, as is a link to the agenda for the workshop.

The organizers of the workshop invited 15 individuals to make presentations at the workshop; all but two accepted our invitation. The two who declined had conflicts on that date. All of the presenters were asked to prepare a five-to-six page paper available for distribution prior to the workshop. All but with one exception submitted a paper; in one instance the presenter chose to send a PowerPoint presentation rather than a written paper. These papers are linked to the agenda.

Trained in the United States: Stay Patterns

The workshop was organized around various themes. It began with a discussion of individuals who are trained in the U.S. and choose to stay after training. **Michael Finn** made a presentation of what can be learned regarding stay patterns of PhD recipients, drawing on the methodology he has developed of matching Social Security numbers

(SSN's) for groups of PhD recipients to earnings records maintained at the U.S. Social Security Administration (SSA). To ensure confidentiality of data, Finn has no access to the data in the Doctorate Records File, the repository of the National Science Foundation's Survey of Earned Doctorates (SED). Instead, the National Opinion Research Center (NORC) sends groups of Social Security numbers to SSA. Then SSA analysts estimate the proportion in each group that paid taxes on at least \$5,000 in earnings and sends the estimates back as group statistics. Using this methodology, Finn has found that stay rates have the following characteristics: (1) a dramatic increase during the 1990s, although they have leveled off recently; (2) field dependent clustering, with agricultural and social sciences having the lowest stay rates; (3) only a slight drop as the amount of time elapsing since receipt of the PhD declines; (4) highest for doctorates from China, India and Eastern Europe, (5) lowest for doctorates from Indonesia, Mexico, Brazil, South Korea and Japan; and (6) overall patterns holding stable over the past decade.

Finn also discussed whether such a methodology could be used to estimate stay rates for foreign citizens receiving bachelors or masters degrees in the U.S. in S&E fields. The challenge to extending the methodology is that whereas the SED asks for SSNs, the other NSF surveys do not. However, when NSF asks the colleges and universities to provide lists of S&E graduates they also request SSNs to help identify and locate the individuals selected for the survey. While this could be a fertile source of SSNs, the problem is that approximately 50% of colleges and universities do not provide the requested SSNs to NSF. Thus, for a researcher the question is whether the universities which supply SSNs have systematically different stay rates compared with the stay rates associated with those who do not supply SSN numbers. Finn proposes that one way to address whether a differential exists is to compare PhD stay rates for institutions that provide SSNs for undergraduate and master degree students to PhD stay rates for institutions that do not provide the SSN numbers. If the total doctorate stay rate is equal to, or very close to the stay rate for the subset of universities providing the SSNs for masters and bachelors recipients, then this provides a strong reason to assume that the masters and bachelors stay rates estimated from the this approach are representative of the national stay rate for all bachelors and masters

The methodology, while promising, faces two additional challenges. First, increasingly respondents to the SED do not supply their SSN. While this creates a problem, it does not appear to introduce a bias given that foreign nationals are no more likely to withhold SSNs than are U.S. citizens.

Second, and more importantly, in the future NSF will not ask for SSNs. However, at least in some cases they will ask for the last four digits of the SSN. Finn concludes that "this will not make it impossible to use the Social Security Master Earnings file to track graduates, as one can match on name and birth date. However, it will make it much more time-consuming and expensive."

Trained in the United States, working outside the U.S.

As Finn's work indicates, although stay rates for PhDs trained in the U.S. are high, some foreign-born PhDs do leave subsequent to receiving their training. Collecting data on those who leave is challenging, but, as the work of **Sunwoong Kim** and **Paula Stephan** demonstrates, not out of the question.

Kim's presentation focused on Korea; Stephan's focused on China, both among the top source countries of PhDs trained in the United States. While China sends considerably more students than Korea, Korea sends the most students to the U.S. in relative terms given the considerably smaller size of its population.

Kim's presentation was notable in two respects. First, it provided insight into the extent to which Korea is dependent on the return of PhDs trained in the United States. According to data provided by the Korean Research Foundation, 52.8% of the foreign PhDs who registered their degrees during the period of 2000 and August 2007 received their training in the U.S. At prestigious universities, U.S. PhDs dominate. For example, at Seoul National University, 52.6% of the professors with PhDs received their training in the U.S. The two other premier science and engineering universities in Korea, Korea Advanced Institute of Science and Technology and Pohang School of Technology, also have high proportions of U.S. PhDs. At the former, for example, 84% of science professors received their doctorates in the U.S. and almost three-quarters of the engineering faculty were trained in the U.S. At the latter, seven-eighths of the science professorate was trained in the U.S. and five-sixths of the engineering professorate was trained in the U.S.

Second, Kim's research documents the degree to which the return patterns reflect economic conditions in Korea. Since the Korean financial crisis of 1997-98, the labor markets for PhDs has loosened at the same time that the performance criteria for PhDs has been increased. In response to these changes, the proportion of new PhDs who intend to stay in the U.S. has increased.

Stephan's research focuses on the extent to which information concerning hires can be obtained by studying the web pages of Chinese universities. Her co-author, Baoyun Qiao from Central University of Finance and Economics in Beijing, organized several graduate students to code the web pages of the 45 institutions of higher education known in China as the "985 Institutions." These 45 institutions constitute a select group singled out by the Chinese government in an effort to direct resources to institutions the government sees as having the greatest potential for success in the international academic community. The students limited their search to programs in economics and in biology.

Their research suggests that a considerable amount can be learned by studying web pages. For example, in economics they found that 38 of the 44 "985 institutions" that had a program in economics maintained web pages with details regarding faculty degrees. Among these, 29 had one or more faculty members with a PhD degree from outside of China; 18 employ one or more faculty with a U.S. PhD, for a total of 130 faculty educated in the U.S. The 130 represent approximately 6% of the faculty at the 38

institutions. The hires are heavily concentrated at three institutions. The mass hiring for western-trained PhDs started in 2004 when the central government of China initiated a special fund to attract western trained, especially U.S. trained PhDs. The research of Qiao and Stephan shows that the PhDs come from almost 60 distinct U.S. institutions and that 8 institutions bestowed 5 or more degrees. Almost 60% of the degrees were granted by a top-25 program as rated by the 1993 NRC report. Using a back-of-the-envelope methodology, the authors estimate that these hires represent more than 50% of all Chinese economists trained in the U.S. who left the U.S. subsequent to receiving their Ph.D. in recent years.

Qiao and Stephan use the same methodology to examine the hiring patterns of biology departments at 985 institutions. In this instance, they find that 34 of the 37 “985 institutions” with programs in biology maintain web pages that provide degree information on faculty. Among these, 21 programs have one or more faculty member trained in the U.S. The 67 faculty represent about 3 percent of the faculty working at the 34 institutions. The 67 trained at 47 different U.S. institutions. Compared to economics, degrees are much less concentrated. A back-of-the-envelope analysis leads the authors to estimate that the 67 represent approximate 7% of U.S. trained Chinese biologists who left the country during the period.

Trained in the U.S. Work Location Unknown

Megan MacGarvie uses a different lens to determine the country of origin of individuals trained in the United States and the influence of country of origin on forward citations to patents invented by U.S. trained PhDs. Specifically, MacGarvie (and her coauthors Shulamit Kahn and Donna Ginther) rely on ProQuest’s Dissertation & Theses database to determine the country of origin of PhDs trained in the United States. ProQuest data have the advantage that, unlike NSF data, they are non-confidential and thus can be readily matched to other databases. The downside is that a minimal amount of information can be determined regarding the PhD recipient from ProQuest and the coding process is somewhat tedious. Another major disadvantage is that only a minority of institutions (the researchers have currently identified 11) require individuals to include biographical information (including country of undergraduate degree) in the frontispiece to their dissertation. Furthermore, ProQuest data have only been available on the web since 1996.

MacGarvie and coauthors make the assumption that country of undergraduate degree is synonymous with home country for PhD recipients. They then test the hypothesis that patents invented by students who received their PhDs in engineering at U.S. universities are disproportionately likely to be cited by patents in the students’ home countries for students with degrees in engineering from the University of California, the University of Illinois and Ohio State between 1996 and 1999. Of the 1720 students receiving degrees, they identify 271 inventors from the NBER patent database, drawn from the USPTO. They use this data to compare the number of citations by patents in the student’s home country to the number of citations associated with other countries. Their results suggest that for students from OECD countries there is a clear “home country bias” in forward

citations. However, PhD inventors from Asian nations are not more likely to have a home advantage.

The ProQuest approach is time consuming but suggests that a certain amount can be learned from public databases. Moreover, it also provides a possible lens for studying masters students in the future to the extent that masters theses are published and available in ProQuest.

Country of Training Unknown

Bill Kerr's work also focuses on inventors. But, unlike the work of MacGarvie and coauthors, he is not focused exclusively on PhD inventors; nor is he focused on inventors educated exclusively in the U.S. Rather, the question that interests Kerr is the degree to which U.S. patents are granted to individuals of different ethnicity and how these patterns have changed over time. Kerr goes about investigating the topic by applying an ethnic-name database, usually used for commercial purposes, to individual patent records in the USPTO data base. To quote Kerr, "the approach exploits the idea that inventors with the surnames Chang or Wang are likely of Chinese ethnicity, those with surnames Rodriguez or Martinez of Hispanic ethnicity, and so on." Nine ethnicities are identified: Chinese, English, European, Hispanic/Filipino, Indian/Hindi, Japanese, Korean, Russian and Vietnamese. Kerr sees two major limitations to the approach: (1) it does not distinguish foreign-born ethnic researchers in the U.S. from later generations working in the U.S.; (2) it does not distinguish finer divisions within the nine major ethnic groups. Kerr's work shows a dramatic increase in the proportion of inventors residing in the U.S. with non-English or European names. For example, the proportion who are Chinese has quadrupled from 1975-2004, going from 2.2% to 8.5%. The proportion Indian has gone from 1.9% to 4.8%; Korean, from .4% to 1.2%; and Russian, from 1.2% to 2.2%.

Vivek Wadhwa used a somewhat similar methodology to estimate the ethnicity of inventors living in the United States. But rather than use data from the USPTO, Wadhwa uses patent data from the World Intellectual Property Organization (WIPO). Drawing on this data base, and using names to identify ethnicity, Wadhwa estimates that in 2006, approximately 17% of international patent applications from the United States had an inventor or co-inventor with a Chinese-heritage name, representing an increase from 11% in 1998. The contribution of inventors with Indian-heritage names increased to 14% from 10% during the same period.

A particular strength of the WIPO database is that it identifies whether the inventor is a foreign national, unlike the USPTO data. Wadhwa uses this feature to estimate the proportion of patent applications filed from the U.S. in 2006 which name a foreign national residing in the U.S. as an inventor or co-inventor. He estimates that the proportion grew from approximately 8% in 1998 to 26% in 2006. Wadhwa is in the process of packaging the WIPO data to make it readily available for analysis to the Science and Engineering Workforce Project.

Wadhwa also made phone contacts with 2,054 companies to study the extent to which engineering and technology companies established between 1995 and 2005 had at least

one key founder who was foreign-born. His findings suggest that the semiconductor industry has the highest percent of foreign-founders, with approximately 35%. He finds that 80% of immigrant-founded companies were in two industry fields: software and innovation/manufacturing-related services. Immigrants were least likely to start companies in the defense/aerospace and environmental industries.

Lynne Zucker and Michael Darby also rely on public data to examine career patterns of scientists and engineers. In particular, they use the Highly-cited data from ISI to examine the location and mobility patterns of exceptionally productive scientists and engineers. The ISI data identifies the top 250 individual researchers in terms of 20-year rolling window citation counts. In their work, they identify 5,401 star scientists authoring over a half-million articles and are able to determine the work location of approximately 50% of them. The reason that they cannot identify location for the entire sample is that ISI article data do not distinguish which address goes with which author. Thus work location is only determined when one address is listed on the article or for authors designated as the corresponding author for whom an address is clearly given. Unlike the work of other researchers at the workshop, “home” country in their work is not identified by birth location or location of undergraduate institution but instead is identified in terms of the country where the individual made their publication debut. Their approach allows them to trace net immigrations across countries. They find, for example, that the four largest net immigrations of star scientists over the last quarter century were the United Kingdom (-27 or 4.6% of all stars resident in the country at any time during the period 1981-2004), the United States (-23 or .6%); Canada (-23 or 7.7%) and Germany with -11, or 3.0%. Their work also allows them to measure how stars cluster across geographic space and the identify how clustering affects various patterns of innovation.

Patents, publications and dissertations are all forms of paper trails that scientists and engineers leave and that can be drawn upon to study career and mobility patterns, ethnicity and birth origins of scientists and engineers working either in the U.S. or abroad. Another form of paper trail that scientists and engineers leave is a CV. **Monica Gaughan** presented evidence concerning the extent to which CVs could be used to determine country of birth of scientists and engineers, drawing on a study of scientists and engineers working in Research Extensive (Carnegie 2000) universities and who held a tenured or tenure track position. From the resulting sample frame of approximately 37,000 approximately 4500 faculty were sampled, with an explicit over-sample of women. The sampled scientists and engineers were asked to complete a questionnaire and to provide a CV.

The researchers found CVs able to provide varying amounts of information. To quote Gaughan, “The length, complexity, and lack of standardization of academic CVs are astonishing.” Of particular interest to the workshop was the degree to which it was uncommonly rare for researchers to include information regarding their location of birth.

For the workshop, Gaughan restricted her remarks to an analysis of the 500 scientists and engineers in her sample who, on the survey, indicated that they were not U.S. citizens. CVs had been found for 350 of these; and at the time of the workshop 211 of these had

been coded. Gaughan reports that of the 211 CVs coded, in only 11 instances were coders able to make inferences regarding whether a person was foreign-born on the basis of non-educational information. More information, however, is available regarding origins when educational histories are considered. Gaughan reports that for about two-thirds of the sample of non-U.S. citizens, the full academic CV can be used to make inferences regarding whether or not a person is foreign-born.

Gaughan concludes that “given this low rate of positive identification, CVs should not be used exclusively to identify foreign-born scholars. However, in combination with other types of data, CVs can be used to develop detailed educational and employment trajectories which may be used to understand how foreign-born scientists enter the US and develop as students and scholars.”

Visa Data

B. Lindsay Lowell discussed the possibility of using H-1B visa data to examine issues related to scientists and engineers working in the United States. H-1B data are available from three sources: Department of Labor: Labor Condition Appointments; Department of Homeland Security: Petition data; and Department of State: Visa Issuances. Each has certain drawbacks. For example, the Department of Labor data are derived from employer applications for positions. Information exists on occupation and wages but no educational information is available. Moreover, multiple applications are present in the database. The Department of Homeland Security Petitions data includes information on occupation, education, and wages. But no information is available on whether the degree was earned in the United States or abroad. Yet when one looks at previous status, and drawing on the 1999 sample, one finds that 60.3% of the H-1B visa holders came from outside the United States; 39.7% were already in the U.S. and were adjusting their visas status. Of these, 58% were in the U.S. as F-1 academic students. The Department of State Visa Issuance database contains information on visas issued abroad but there is no information regarding the worker characteristics.

Lowell provided several examples of how the H-1B data can be used in making inferences regarding characteristics of H-1B holders. By way of example, petitions approved by level of education can be computed and indicate that all but a handful have at least a bachelor's degree and a not insignificant percent have a master's or PhD degree. Annual compensation by occupations can also be computed for continuing employment

Guillermina Jasso presented estimates, created by Jasso and coauthors Wadhwa, Rissing, Gereffi and Freeman, regarding the number of persons waiting for employment-based legal permanent residence visas in the U.S. as of the end of Fiscal 2006, as well as the number waiting abroad. While not all of the principals waiting are scientists and engineers, many are. Moreover, many of the immigrants who acquire permanent residency because of familial relationships (such as spouse) are highly skilled. Their work develops a methodology for constructing estimates of the number actually waiting for permanent residency. Their estimates suggest that approximately 500,000 principals were waiting in the U.S. for permanent residency and a slightly larger number of family members were also waiting. Approximately 60,000 principals were waiting abroad, and

slightly more than 60,000 family members were waiting abroad. All told, this means that 1,181,505 individuals were waiting worldwide for employment-based permanent residency in the U.S. The number of employment-based visas granted annually is approximately 120,000, suggesting that the queue is approximately nine times the number of admits.

Jasso also took a few minutes to briefly talk about the New Immigrant Survey, begun in 2003-2004 and administered by NORC. The survey, which is longitudinal in nature, has a number of questions related to school, training and occupation and will be a useful research instrument for those interested in studying the foreign-born science and engineering workforce living in the United States.

Working in the U.S.

Sharon Levin noted that a question that often arises in studying the careers of the foreign-born and foreign-trained working in the United States is the degree to which the sample represents the underlying population. Thus, for example, how do the mobility patterns that Zucker and Darby infer from the Highly Cited Data compare to underlying patterns of mobility of foreign talent to the U.S. in science and engineering? In order to make such inferences, it is important to have underlying benchmarks of the number of foreign-born and foreign-trained working in the United States. Unfortunately, it is difficult to create such benchmarks given that most of the data collected on scientists and engineers in the U.S. in any systematic way comes from a sampling frame based on degrees granted within the U.S. Only one survey systematically includes scientists and engineers educated outside the U.S. That survey is the postcensal survey, conducted in 1993 and 2003, and in both instances referred to as the National Survey of College Graduates (NSCG). The sampling frame for each of these surveys was college graduates identified from the long form of the previous decennial U.S. population census, with over sampling of those reported working in an S&E occupation. The 1993 NSCG was drawn from those residing in the U.S. on April 1, 1990 or residing abroad as U.S. military personnel; the 2003 NSCG was drawn similarly but with a reference date of October 1, 2003.

The survey is the only instrument to collect information systematically on individuals trained outside the U.S. but working in the U.S. It has, however, several drawbacks. First, as **Mark Regets** of NSF documents in comments prepared for the workshop, it only captures individuals in the sample if the individual was (a) in the U.S. in April 2000; (b) understood that the 2000 Census applied to non-citizens and participated; and (c) was in the United States during the SESTAT/NSCG reference date. Second, the base sample is only refreshed once every ten years. Despite these shortcomings, it remains the best available dataset for studying foreign talent in the scientific labor force containing specific information on citizenship status, country of birth, year the individual came to the United States, as well as extensive data on employment and education. Unfortunately, the Census Bureau plans to eliminate the long form of the decennial census with the 2010 census. Instead, it plans to use the American Community Survey (ACS) as the basis for determining the NSCG sampling frame. Presently, a taskforce has

been convened by NSF to study the issues involved in using the ACS as the means to obtain data on the S&E workforce.

A final topic discussed at the workshop was the fact that postdocs and other apprenticeship-like short-term research positions employ large numbers of foreign-trained doctorate-level scientists and engineers. Decentralized hiring (postdocs are often hired by the principal investigator) and the ability to come as a postdoc on several different visa classes makes it almost impossible to know the total number of postdocs in the United States, let alone their nativity and other characteristics (see discussion of Mark Regets.) Some speculate that as many as 50% of all postdocs in the United States received their doctoral training outside the U.S. The final two presentations at the workshop addressed how we could go about learning more about the foreign-born and foreign-educated postdoc and other apprenticeship-like population residing in the United States.

Alyson Reed made a presentation regarding the plans of the National Postdoctoral Association to field a survey to postdoctorates working at U.S. universities. The survey, which is planned for 2008, will be built upon the Sigma Xi survey administered to postdocs in 2004.

Emilda Rivers provided comments regarding NSF's efforts to study the postdoc population in greater depth than has been provided in the past through either the National Science Foundation's Survey of Doctorate Recipients (SDR) or the Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS). This effort began in 2006 when the Foundation gathered information, in what is referred to as Phase I of the study, from key groups concerning the availability of data, data needed on postdocs and methods for gathering needed data. There was a general consensus that considerable gaps existed in the existing data related to foreign degreed (for example the GSS provides no information on country of origin of those working as postdocs who are in the U.S. on temporary visas; nor does it provide information on where the doctorate degree was awarded for those on temporary visas). Neither does the GSS collect information on postdocs working in non-academic institutions. Concern was also expressed that little information was being collected regarding the quality of the postdoc experience. Neither was there systematic information concerning the transition from postdoc to non-postdoc position. Given response to the Phase 1 study, NSF has embarked in Phase 2 with goals of improving NSF's count of postdocs and developing a comprehensive sampling frame of individual postdocs for future survey activities.

Conclusion

Michael Teitelbaum summarized the day's discussion regarding methodologies available for studying the career patterns of foreign-born scientists and engineers and noted that a large number of approaches and databases had been discussed, including surveys, publicly available data sources, and surveys directed to specific groups. Surveys discussed include those overseen by the National Science Foundation, such as the SED, the SDR and the NSCG. In addition the New Immigrant Survey administered by NORC is just coming on line and has the possibility of informing a number of issues

related to career outcomes. Two surveys focused on postdoctoral scholars are also likely to be forthcoming in the near future: one administered by the National Postdoctoral Association and the other by the National Science Foundation. A data source that was not mentioned at the workshop, but which provides considerable information regarding individuals working in science and engineering occupations is the Current Population Survey (CPS). Richard Ellis, for example, has used the Merged Outgoing Rotation Groups (MORG) extracts to study changing immigrant composition of the science and engineering workforce in the United States.

Teitelbaum also noted that a considerable amount can be learned from public databases. For example, the work of MacGarvie and coauthors shows that information concerning the undergraduate origins of PhDs can be obtained, for certain U.S. institutions, from ProQuest data. Zucker and Darby's work shows the amount of information that can be learned by studying ISI's Highly-Cited database; Stephan and Qiao's work demonstrates that a considerable amount can be learned by studying webpages of foreign institutions. MacGarvie and Kerr use the USPTO database to examine patenting activity; Wadhwa uses WIPO data to study the ethnicity and nationality of inventors living in the United States.

Information can also be gained by using survey methodology. The two examples mentioned at the workshop are the study of scientists and engineers discussed by Gaughan and the phone interviews of start-up firms discussed by Wadhwa.

Certain topics/groups are clearly understudied. For example, Teitelbaum, in his comments, encouraged that more attention be directed to studying the careers of bachelor's and master's recipients, rather than focusing almost exclusively on PhDs. He also suggested that much would be learned by placing greater emphasis on non-U.S. data, such as WIPO, rather than continually focusing on USPTO data. Much can also be learned by broadening institutions studied. For example, Stephan and Qiao focus exclusively on individuals working at Chinese universities, ignoring scientists and engineers working in firms. One way to collect more information regarding employees working abroad is to survey U.S. firms regarding the characteristics of their R&D workers abroad. Teitelbaum also noted the gains to be made by making researchers working in the area more aware of each other's work, the need for which was underlined by the fact that many of the participants at the workshop only became aware of each other's work after being invited to participate.

Thus, the workshop organizers have taken a range of additional steps. First, by way of follow-up, the organizers have created a link on the SEWP webpage whereby interested individuals can share information with each other. (See <http://www.nber.org/sewp/sewp-discuss/>.) Information regarding the link is being sent to all participants at the workshop.

Second, the organizers also plan to organize and propose a session on career outcomes of foreign-born and foreign-trained at the 2009 AAAS meetings.

Third, and if budget permits, it is proposed to organize a follow-up workshop in the spring of 2009.

Finally, this report will be posted on the SEWP webpage and distributed to all participants at the workshop.

Agenda with links to papers and list of participants, including affiliations can be found at <http://nber15.nber.org/confer/2007/SEWP07/SEWP07prg.htm>.

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