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⁹ These results are contained in V. V. Acharya and N. Mora, "Are Banks Passive Liquidity Backstops? Deposit Rates and Flows during the 2007–09 Crisis," NBER Working Paper No. 17838, February 2012.

¹⁰ V. V. Acharya, H. Almeida, and M. Campello, "Aggregate Risk and the Choice between Cash and Lines of Credit," NBER Working Paper No. 16122, June 2010, forthcoming in the *Journal of Finance*.

¹¹ V. V. Acharya, G. Afonso, and A. Kovner, "How do Global Banks Scramble

for Liquidity? Evidence from the Asset-Backed Commercial Paper Freeze of 2007," forthcoming as an NBER Working Paper.

¹² V. V. Acharya and O. Merrouche, "Precautionary Hoarding of Liquidity and Inter-Bank Markets: Evidence from the Sub-prime Crisis," NBER Working Paper No. 16395, September 2010, published in *Review of Finance*, 17(1), (2013), pp.107–60.

¹³ See theory and empirical evidence for strategic demand for cash in a crisis in V. V. Acharya, H. S. Shin, and T. Yorulmazer, "Crisis Resolution and Bank Liquidity," NBER Working Paper No. 15567,

December 2009, published in *Review of Financial Studies*, 24(6), (2011), pp. 2166–2205.

¹⁴ For theoretical and empirical treatment of this bank-sovereign nexus, see V. V. Acharya, I. Drechsler, and P. Schnabl, "A Pyrrhic Victory? Bank Bailouts and Sovereign Credit Risk," NBER Working Paper No. 17136, June 2011.

¹⁵ V. V. Acharya and R. G. Rajan, "Sovereign Debt, Government Myopia and the Financial Sector," NBER Working Paper No. 17542, October 2011, forthcoming in *Review of Financial Studies*.

Immigrant Selection and Assimilation during the Age of Mass Migration

Leah Boustan*

The Age of Mass Migration from Europe to the New World (1850–1913) was one of the largest such episodes in human history. By 1910, 22 percent of the U.S. labor force was foreign born, compared to "only" 17 percent today. In a joint research program with Ran Abramitzky and Katherine Eriksson, I ask three related questions about this large and formative migrant flow: Were migrants who settled in the United States in the late nineteenth century positively or negatively selected from the European population? What was the economic return to this migration? And, how did these new migrants fare in the U.S. labor market, both upon first arrival and after spending some time in the country?

A better understanding of the Age of

Mass migration can inform our views of the past and the present. During this era, the United States maintained an open border for European migrants, which allows us to observe the immigration process in the absence of government constraints. Furthermore, beliefs about (the lack of) immigrant assimilation at the time have contributed to the formation and passage of the more restrictive migration policies of today.

Our project greatly expands our knowledge of this era by creating and analyzing two large panel datasets of trans-Atlantic migrants from historical Census records. Our first dataset links 50,000 men from their birthplace in the 1865 Norwegian Census to their adult residence in 1900 in either the United States or Norway. We focus on Norway because it is a large sending country and has two complete digitized historical Censuses (1865 and 1900).¹ Our second dataset follows 24,000 men, including immigrants from 16 European sending countries and a comparison group of U.S.

natives, in the U.S. labor market from 1900 to 1910 to 1920. Assembling this data has been made possible by the public release of Census manuscripts 70 or more years after the initial survey. We match individuals across Census waves by first name, last name, age, and place of birth.

For all of its advantages, the historical data also have two limitations. First, match rates across Censuses tend to be low, mainly because men with common names cannot be uniquely linked; our match rates range from 20 to 30 percent, which is standard in this literature.² Despite low match rates, our matched sample is roughly representative of the population. Second, we are only able to collect information about individual occupations, rather than individual earnings, which the Census first recorded only in 1940. Our standard approach is then to assign individuals the mean earnings in their occupation cell, which we refer to as "occupation-based earnings." This measure cannot capture aspects of the return to migration and of labor market assimila-

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tion that occurs by attaining higher earnings *within* occupation cells.

Economic Return to Migration

A simple measure of the return to migration contrasts the earnings of migrants to the United States with the earnings of men who stayed in Europe. This basic approach can be confounded by migrant selection. For example, if the brightest people—those who would have earned more regardless of location—were the most likely to move to the United States, then a naïve estimate of the return to migration will be biased upward; likewise, the return to migration will be biased downward in the case of negative selection. We thus compare the earnings of migrants to the earnings of their brother(s) who remained in Europe, an approach that eliminates the across-household component of migrant selection. Such selection will be present if households that were financially constrained or that faced poor economic opportunities in Europe experienced different propensities to migrate.

We estimate a return to migration within brother pairs of around 70 percent.³ These returns are lower than contemporary estimates for the return to migration from Mexico to the United States, as would be expected given the relatively unconstrained supply of migrant labor in this era.⁴ In addition, our estimation method reveals evidence of negative occupational selection for migrants leaving urban areas. In particular, we find that the population estimate of the return to migration in the urban sample is 20 to 30 percent lower than the within-brother estimate, a pattern that we attribute to negative selection of migrant households.

Migrant Selection

We provide more direct evidence of negative selection in this migrant flow by comparing the socio-economic status of the fathers of migrants and non-migrants.⁵ We find that the fathers of migrants in both rural and urban areas have lower occupation-based earnings; are

less likely to own assets, including land, an owner-occupied home, or a business; and, conditional on owning some land, have property of lesser value as proxied by their property tax bills. A similar pattern holds for both migration to the United States and internal migration within Norway. Taken together, this evidence suggests that men with poorer economic prospects were more likely to migrate in the late nineteenth century.

We further demonstrate that men with a higher likelihood of inheriting land are less likely to migrate. Inheritance varied both by birth order and by the gender composition of one's siblings. On Norway's western coast and in the far North, two areas where primogeniture was particularly strong, oldest sons could expect to inherit the family farm. In these regions, oldest brothers in households with land were less likely to migrate than were their younger brothers. In the rest of the country, household assets were more likely to be divided between sons. In these regions, men with more brothers, as opposed to sisters, from households with land were more likely to migrate. In both cases, the lower a man's expected wealth, the more likely he was to leave his municipality of birth for destinations both internal and international. Neither birth order nor gender composition of siblings influence migration among sons in landless households.

Migrant Assimilation

We then turn to the success of these newcomers in the U.S. labor market, asking how immigrants from Norway and 15 other sending countries fared upon arrival.⁶ The consensus from prior studies, all of which have been based on cross-sectional data, is that these immigrants held substantially lower-paid occupations than natives upon first arrival but experienced rapid convergence with natives over time.⁷ Yet inferring assimilation from a cross section is subject to well-known biases caused by changes in the skill levels of immigrant arrival cohorts over time and to the potentially selective return migration to source countries.⁸ Over a quarter of migrants returned to Europe

during this period. In some cases, return migrants used a deliberate strategy of temporary migration to the New World. These temporary migrants will appear negatively selected in our data if they remained in low-paid occupations during their short sojourn in the United States.

Ideally, one could follow the career trajectories of individual immigrants as they spend time in the United States. Our panel dataset approximates these ideal conditions. Contrary to the existing literature, we find that the typical immigrant in the panel did not face a large initial earnings penalty upon first arrival in the United States and moved up the occupational ladder at the same rate as the native born. We conclude that the large earnings gap and subsequent convergence observed in a single cross-section is driven by a combination of declining skill levels across immigrant arrival cohorts, both between and within countries-of-origin, and by the departure of negatively-selected return migrants.

Our study is the first to document the substantial heterogeneity in the assimilation patterns of migrants from different countries of origin. Immigrants from France, Russia, and the English-speaking countries of the United Kingdom held significantly higher-paid occupations than U.S. natives upon first arrival, while immigrants from other countries started out in equivalent or lower-paid occupations. Regardless of starting position, immigrants from almost every country moved up the occupational ladder at the same rate as natives, rather than progressing faster to converge with natives. As a result, any initial occupation-based gaps between immigrants and natives were preserved over time.

Broader Conclusions

Our work on the Age of Mass Migration contains three important lessons for our understanding of the economics of immigration.

Roy model

The Roy model predicts that migrants will be negatively selected if the send-

ing country has a higher return to skill or more unequal income distribution than the destination.⁹ Unlike today, Norway was more unequal than the United States in the nineteenth century. Therefore, our finding of negative migrant selection from Norway to the United States is consistent with the standard Roy model.

In contrast, most work on contemporary immigrant flows finds little empirical support for the Roy model.¹⁰ One explanation for positive migrant selection today is that the high cost of migration, including fees for entering the United States illegally, prevents the poor from engaging in migration.¹¹ The cost of migration was lower in the past, which may have allowed the negative selection predicted by the Roy model to be manifest.

Financial constraints

Hanson (2010) and Clemens (2011) forcefully argue that one of the most effective international development policies would be easing national migration restrictions in developed countries.¹² Yet, even if explicit barriers to migration were lowered, high migration costs and credit constraints might prevent the world's poor from moving to rich countries. Our finding of negative selection during the Age of Mass Migration suggests that a lack of household (or individual) wealth did not pose a barrier to migration at a time when U.S. borders were open to European migrants and migration costs were relatively low. These findings suggest that lifting migration restrictions may be sufficient to facilitate migration among the world's poor.

Assimilation

Contemporaries questioned the ability of European immigrants to assimilate into the U.S. economy and called for strict migration restrictions that favored countries with highly-skilled residents. Our results indicate that these concerns were unfounded: the average permanent immigrant in this era arrived with skills similar to those of natives and experienced identical rates of occupational upgrading over their lifecycle. These successful outcomes suggest that migration restric-

tions are not necessary to ensure migrant assimilation. At the same time, we also note that migrants who arrived with low skill levels did not manage to close their skill gap with natives over time. This finding undercuts the commonly-held view that, unlike today's migrants, past waves of European immigrants, even those who arrived without the ability to read or to speak English, were able to quickly catch up with natives.

¹ U.S. data is taken from the Integrated Public-Use Microdata Series (IPUMS) and the genealogy website, Ancestry.com. For similar analyses for migrants from Great Britain or the U.S. South, see J. Ferrie and J. Long, "British, American, and British-American Social Mobility: Intergenerational Occupational Change Among Migrants and Non-Migrants in the Late 19th Century," manuscript, 2012, and W. Collins and M. Wanamaker, "Selection and Earnings Gains in the Great Migration of African Americans: New Evidence from Linked Census Data," manuscript, 2012.

² An introduction to modern linking methods can be found in J. Ferrie, "A New Sample of Americans Linked from the 1850 Public Use Micro Sample of the Federal Census of Population to the 1860 Federal Census Manuscript Schedule," NBER Historical Working Paper No. 71, August 1995, and Historical Methods, 29 (1996), pp. 141–56.

³ R. Abramitzky, L. Boustan, and K. Eriksson, "Europe's Tired, Poor, Huddled Masses: Self-Selection and Economic Outcomes in the Age of Mass Migration," NBER Working Paper No. 15684, January 2010, and American Economic Review, 102 (2012), pp. 1832–56.

⁴ G. Hanson, "Illegal Migration from Mexico to the United States," NBER Working Paper No. 12141, April 2006, and Journal of Economic Literature, 44 (2006), pp. 869–924.

⁵ R. Abramitzky, L. Boustan, and K. Eriksson, "Have the Poor Always Been Less Likely to Migrate? Evidence From Inheritance Practices During the Age of Mass Migration," NBER Working Paper

No. 18298, August 2012, and Journal of Development Economics, forthcoming.

⁶ R. Abramitzky, L. Boustan, and K. Eriksson, "A Nation of Immigrants: Assimilation and Economic Outcomes in the Age of Mass Migration," NBER Working Paper No. 18011, April 2012.

⁷ Most recently, see T. Hatton, "The Immigrant Assimilation Puzzle in Late Nineteenth-Century America," Journal of Economic History, 57 (1997), pp. 34–62, and C. Minns, "Income, Cohort Effects and Occupational Mobility: A New Look at Immigration to the United States at the Turn of the 20th Century," Explorations in Economic History, 37 (2000), pp. 326–50.

⁸ G. Borjas, "The Impact of Assimilation on the Earnings of Immigrants: A Reexamination of the Evidence," NBER Working Paper No. 1515, February 1986, and Journal of Labor Economics, 3 (1985), pp. 463–89 (under the title "Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants"), and D. Lubotsky, "Chutes or Ladders? A Longitudinal Analysis of Immigrant Earnings," Journal of Political Economy, 115 (2007), pp. 820–67.

⁹ A. Roy, "Some Thoughts on the Distribution of Earnings," Oxford Economic Papers, 3 (1951), pp. 135–46, and G. Borjas, "Self-Selection and the Earnings of Immigrants," NBER Working Paper No. 2248, issued in 1988, and American Economic Review, 77 (1987), pp. 531–53.

¹⁰ D. Chiquiar and G. Hanson, "International Migration, Self-Selection, and the Distribution of Wages: Evidence from Mexico and the United States," NBER Working Paper No. 9242, September 2002, and Journal of Political Economy, 113 (2005), pp. 239–81; C. Feliciano, "Educational Selectivity in U.S. Immigration: How Do Immigrants Compare to Those Left Behind?" Demography, 42 (2005), pp. 131–52; and J. Grogger and G. Hanson, "Income Maximization and the Selection and Sorting of International Migrants," NBER Working Paper No. 13821, February 2008, and Journal of Development Economics, 95 (2011), pp. 42–57. For a

contrary view of the selection of Mexican migrants, see J. Fernández-Huertas Moraga, "New Evidence on Emigrant Selection," *Review of Economics and Statistics*, 93(2011), pp. 72–96.

¹¹ D. McKenzie and H. Rapoport, "Network Effects and the Dynamics of Migration and Inequality: Theory

and Evidence from Mexico," *Journal of Development Economics*, 84 (2007), pp. 1–24, and "Self-Selection Patterns in Mexico-US Migration: The Role of Migration Networks," *Review of Economics and Statistics*, 92 (2010), pp. 811–21.

¹² G. Hanson, "Why Isn't Mexico Rich?"

NBER Working Paper No. 16470, October 2010, and *Journal of Economic Literature*, 48(2010), pp. 987–1004, and M. Clemens, "Economics and Emigration: Trillion-Dollar Bills on the Sidewalk?" *Journal of Economic Perspectives*, 25 (2011), pp. 83–106.

Saving in Developing Countries

Eswar S. Prasad*

The evolution of national savings in developing countries (a broad term that I use here to refer to middle-income emerging markets, as well as less developed low-income economies) has received considerable attention in discussions of global current account imbalances. In the run-up to the global financial crisis, these imbalances were characterized by large and rising current account deficits in the United States, United Kingdom, and a few other advanced economies, matched by corresponding surpluses in many emerging markets and a few oil-exporting economies. Rising saving rates in China and many other Asian economies began to receive increased attention from researchers around this period, and Federal Reserve Chairman Ben Bernanke's 2005 speech arguing that the "savings glut" in emerging markets was a proximate cause of the imbalances gave further impetus to that research.¹

Economists have been more successful in explaining changes in saving rates within specific countries over time than

in explaining differences in saving levels across countries.² The fact that Asian economies traditionally have had higher saving rates than developing and industrialized economies in other regions has received some attention, but there is no persuasive explanation for this phenomenon. Economists have had to rely on weak non-economic explanations, such as the argument that Asians are culturally predisposed towards saving. This hypothesis has been formally tested using data from the U.S. Census to examine whether immigrants to the United States from high-saving countries tend to save more than immigrants from low-saving countries. The results show that there are significant differences in immigrants' saving behavior by country of origin, but those differences do not match up with the differences in national saving rates. In particular, immigrants from high-saving Asian countries do not save more than other immigrants.³

Saving in Asia

Given their high and rising saving rates, Asian economies have been the subject of considerable research. In an early contribution focusing on the region, Susan Collins looks at rising national saving rates in nine Asian developing econo-

mies (plus Turkey) over the period 1960–84. She concludes that high growth rates, a low dependency ratio, and high income levels are all positively associated with saving rates. She argues further that there are structural differences between low-income and middle-income countries in the determinants of savings.⁴

Charles Horioka and Akiko Terada-Hagiwara find that domestic saving rates in developing Asia rose during the period 1966–2007. They conclude that the main determinants of those trends were the age structure of the population (especially the elderly dependency ratio), income levels, and the level of financial sector development.⁵ They forecast that over the next two decades the domestic saving rate in developing Asia as a whole will remain roughly constant, despite rapid population aging in most of those economies, in part because the negative impact of population aging on the domestic saving rate will be largely offset by the positive impact of higher income levels.

National saving comprises saving by households, corporations, and the government. Household savings typically has attracted most of the attention of researchers because it is more amenable to theoretical modeling than the other components of national saving, and because its determinants can be analyzed using

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