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mists through a better empirical understanding of the evolving relationship between financial markets and the real economy.

A number of serious econometric questions — from identifying causality and structural parameters of interest to quantifying economic magnitudes — arise as one embarks upon the journey to link finance with macroeconomics. However, advancements in information technology, econometrics, and micro-founded theoretical models together put us in a much better position than our predecessors to overcome these obstacles.

Our own work highlights the availability of large datasets that enable researchers to break down macroeconomic aggregates to the level of actual decision making. For example, we can track individual-level borrowing decisions. We can quantify house prices and consumer spending at a much more granular level than ever before. We can observe job creation and destruction at the establishment level and follow household mobility across space and time. We have data that track borrower-lender relationships in the banking sector.

At the same time, the theoretical

literature increasingly has developed more “bottom-up” macroeconomic models in which agents explicitly maximize objective functions and frictions between agents are carefully modeled. These models provide a richer set of predictions which can now be tested with increased rigor given the availability of large-scale microeconomic data. Moreover, the development of new empirical techniques in applied microeconomic fields offers tools that can more effectively tease our causal relations in the macroeconomy.

¹ B.J. Eichengreen and K. Mitchener, “The Great Depression as a Credit Boom Gone Wrong”, *Bank of International Settlements Working Paper 137*, September 2003; and R. Koo, *The Holy Grail of Macroeconomics: Lessons from Japan’s Great Recession*, John Wiley & Sons, Singapore, 2009. *The Great Depression, like the current economic downturn, was preceded by a sharp increase in household leverage. Japan’s Great Recession was preceded by a sharp increase in non-financial corporate leverage.*

² A.R. and A. Sufi, “The Consequences of Mortgage Credit Expansion:

Evidence from the U.S. Mortgage Default Crisis,” *NBER Working Paper No.13936*, April 2008, and *Quarterly Journal of Economics 124*: pp.1449–96.

³ A.R. Mian and A. Sufi, “House Prices, Home Equity-Based Borrowing, and the U.S. Household Leverage Crisis,” *NBER Working Paper No.15283*, August 2009, forthcoming in *American Economic Review*.

⁴ A.R. Mian and A. Sufi, “Household Leverage and the Recession of 2007 to 2009”, *NBER Working Paper No.15896*, April 2010, and *IMF Economic Review*, 58: pp. 74–117.

⁵ A.R.Mian and A.Sufi, “Consumers and the Economy, Part II: Household Debt and the Weak U.S. Recovery”, *FRBSF Economic Letter*, January 18, 2011.

⁶ A.R. Mian, A. Sufi, and F. Trebbi, “Foreclosures, House Prices and the Real Economy”, *NBER Working Paper No. 16685*, January 2011.

⁷ A.R. Mian A. Sufi, and F. Trebbi, “The Political Economy of the U.S. Mortgage Default Crisis”, *NBER Working Paper No.16107*, June 2010, and *American Economic Review*, 100: pp.1967–98.

The Labor Market Effects of Immigrants

Giovanni Peri*

Introduction

International migration is firmly restricted by national policies and national laws. While capital, technology,

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and goods move globally with few restrictions, governments heavily regulate the movement of labor, restricting the number of foreign nationals who reside and work in their countries. In spite of this, immigration into the rich countries of Europe, North America, and Oceania increased dramatically during the last decade. As of 2009, around 10 percent of the working age population in the OECD countries and about 14 percent of that

population in the United States was born abroad. That was up from around 6 percent in the OECD and 11 percent in the United States, in 2000.

From a world perspective, international migration is a formidable way to increase individual productivity: immigrants moving from poor to rich countries nearly quintuple their income (on average) after the move.¹ Therefore, less restrictive immigration policies could

generate huge gains, accruing in large part to migrants. What would be the effects on the economies of the receiving countries, though? Would immigrants take the jobs of natives or stimulate firms' growth? Who would suffer losses? Who would benefit? Would native workers be better or worse off with more immigrants?

My research agenda, developed with a number of co-authors during the last several years, has analyzed the economic impact of immigrants, helping to identify some crucial aspects that need to be considered in describing the labor market effect of immigration on natives. First, for example, we have emphasized that differences in the skill distribution (schooling and age) between natives and immigrants, and in the interactions of these skills in production, are crucial to assessing the skill-specific effect of immigrants on wages and employment. Second, we have identified an important mechanism of specialization, which allows local economies to absorb less educated immigrants with little or no adverse effects on native wages and potentially positive effects on productivity. Third, we have looked across countries to see how economies outside the United States have absorbed recent immigrant flows and what the role of labor market institutions has been in determining the wage and employment effects of immigrants. I describe these contributions below.

Immigrants and Natives: Competition and Complementarity

From a labor market perspective, immigration is an inflow of workers distributed across education and experience cells (skills). This was emphasized first in an influential paper by George Borjas.² Because workers with different skills tend to perform different jobs, immigrants in a skill group tend to compete more intensely with natives in the same group than with natives in other groups. They may even "complement" workers in other skill groups. This means, for instance, that a young, less educated construction laborer competes with (hence reduces the

demand for) native construction workers but he/she also complements (and increases the demand for) native construction-supervisors and engineers. Similarly, an immigrant engineer competes with native engineers but he/she complements native construction supervisors and construction workers. One needs to account for both this direct and indirect competition and the complementary effects in order to characterize the impact of immigrants on the demand for native workers. Gianmarco Ottaviano and I³ use this multiple skill-group approach to estimate the parameters needed to identify the competitive and the complementary channels, and finally to evaluate the wage effect of immigrants.

Our findings imply that immigration to the United States in 1990–2006 had a small impact on the wages of native workers with low levels of education. Our preferred estimates are actually positive and range between 0.5 percent and 1.5 percent. Similarly, native workers overall have gained a small 0.6 percent in wages because of the immigrant flows in 1990–2006.

Three important factors account for these small positive gains and offset the potential losses from competition in the labor market. First, firms have responded to the increase in workers by investing. Capital adjustment, which was reasonably fast in response to a small and predictable inflow of workers,⁴ maintained the capital intensity of the economy at a roughly constant level over the period. Hence immigrants did not crowd out existing workers but simply increased the size of the economy.

Second, while the United States attracts many immigrants with low education, it also attracts many with very high education. The previous literature considered four schooling groups as distinct (workers with no degree; high school graduates; workers with college education; and workers with a college degree), but we show that in the recent decades (1960–2006) native workers with no degree and native high school graduates constitute a group of essentially homogeneous workers. Similarly, at a high level

of education, workers with some college and college graduates compete for similar jobs. When we consider only two schooling groups (college educated and non-college-educated) rather than four, as differentiated by their contribution to production, it turns out that immigrants and natives are distributed between groups in similar proportions.⁵ Therefore, immigration did not alter the relative supply and, consequently, the compensation of more educated relative to less educated workers much.

Finally, the small wage effects are attributable to imperfect substitutability between immigrants and natives in the same skill group. In particular, immigrants have different abilities, choose different occupations, and perform different jobs than natives in the same skill group. These differences further reduce the competition between natives and immigrants in a skill group and add to their overall complementarity. These effects combined to attenuate the labor market competition of immigrants and natives, particularly those with low schooling. Immigration turns out to have had a small (and positive) effect on the demand for less educated native workers.

The Area Approach

The approach adopted above uses a structured analysis of labor markets by skills, and considers the United States as one labor market. However, many previous studies⁶ have used local labor market effects (in U.S. states or cities) to assess the wage and the employment consequences of immigrants. This is often described as "the area approach. But if workers are mobile in the long run, then local differences in wages will be arbitrated away. This criticism recently was applied to the area approach by Borjas (2003, 2006).⁷

I re-consider the area approach in a recent paper,⁸ adopting the skill group structure (used in the national approach) at the local level, but allowing workers of a certain skill group to move nationally in response to immigration, in order to arbitrage wage differentials. I apply this structure to the case of California, which

received a massive net inflow of immigrants (8 percent of its population in each decade) in the 1970s, 1980s, and 1990s. In this context, immigration to California in a skill-group should not affect the wage but may affect the employment of that group, as natives move in response to immigration. I found that by looking at how the employment of natives in a skill group responds to immigration, it is possible to derive an alternative estimate of their substitutability with natives. That substitutability is high if the employment effect of immigrants on natives is negative, but it is small if the employment effect is zero or positive.

The empirical estimates for California over the period 1960–2005 show essentially no employment (or wage) effect of immigrants on natives in the same skill group. In my framework, this implies imperfect substitution between immigrants and natives, with an elasticity of similar magnitude⁹ as found using wage data at the national level in Ottaviano and Peri (2008).

Manual and Communication Tasks

What exactly makes immigrants and natives imperfectly substitutable? Chad Sparber and I¹⁰ tackle this question by analyzing the productive specialization of natives and immigrants. The explanation resides in the relative productivity of natives and immigrants in “manual-intensive” and “communication-intensive” production tasks. Because immigrants are less proficient in the local language, they have a tendency to specialize in manual-intensive jobs. In response, natives specialize in communication-intensive jobs where they are relatively more productive. As the share of immigrants grows and their supply of manual tasks increases, natives further specialize in communication tasks, the return on which increases as they complement manual tasks. This process is particularly strong for workers with low levels of education. This mechanism is qualitatively and quantitatively strong enough to generate the observed degree of imperfect substitution between native and immigrants.

Examples of this phenomenon are numerous. Natives who begin their career as waiters may become cook/kitchen-managers as immigrants take the jobs of waiting and preparing food. Others begin as construction workers and become construction supervisors as immigrants take the manual jobs of building, and so on. The evolution along one’s lifetime from more manual to more “communication-intensive” jobs takes place naturally for most workers. We find that this process was accelerated in states with a high degree of immigration.

In a related paper¹¹ I show that such reorganization of tasks along specialization of immigrants and natives is associated with a reorganization of production and adoption of techniques that also may have increased overall productivity, especially for less educated workers, in U.S. states.

International Comparisons

Are these effects of immigration on labor markets and the described mechanism of absorption of immigrants specific to the United States? European countries have experienced inflow of immigrants that were larger than those of the United States, relative to their population, during the 1990s (Germany) or the 2000s (Spain and Italy).

In our analysis of how European labor markets absorbed immigrants, we find several commonalities and some interesting differences with the United States. First in a paper on Germany, Ottaviano, Francesco D’Amuri, and I¹² find that immigrants and natives are imperfect substitutes. However, the insiders’ protection which is typical of more regulated European markets has produced more competition among immigrants who tend to crowd out employment opportunities of earlier immigrants. The employment rate among immigrants was lower than among natives in Germany (unlike the United States, where the opposite is true). In the presence of unemployment benefits, this may generate a transfer to immigrants and lower benefit for natives.

In a very recent paper, D’Amuri and

I¹³ analyze the manual-communication task mechanism in Europe. We find that while European workers too moved to more communication-intensive and complex jobs in response to immigration, they did this at a much slower rate than U.S. workers. Moreover, splitting countries into those with high and those with low employment protection, we find that the occupational mobility of natives in response to migration has been particularly slow in countries with high employment protection. The existence of national contracts, strong insider entitlements, and the high costs of hiring and lay-offs have reduced the mobility of workers and thus the operation of a mechanism that could protect wages and employment in the presence of immigrant competition. The group most affected by the differences in employment protection is less educated natives; in Europe they have responded the least to immigrants, remaining more vulnerable to their competition.

Further Research

Many interesting questions about the economic effects of immigration remain to be studied. At the cross-country level, we need to better understand the overall impact of immigrants on productivity and growth, especially in conjunction with other globalization phenomena such as trade and capital movements. At the micro level, we need to learn more about the interaction between firms, immigrants, and natives in order to more clearly identify productivity and employment effects. We also need to consider the impact of emigration (a loss of workers), especially of highly skilled workers. I hope to explore these themes in the next few years.

¹ As shown in M. Clemens, C. Montenegro, and L. Pritchett, “The Place Premium: Wage Differences for Identical Workers across the U.S. Border,” Working Paper # 148, Center for Global Development, 2009. Available at: <http://www.cgdev.org/content/publications/detail/16352>

² G.J. Borjas, “The Labor Demand

Curve is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market, Quarterly Journal of Economics, 118, pp.1335–74, (2003).

³ G.I.P. Ottaviano and G. Peri, “Rethinking the Effects of Immigration on Wages,” NBER Working Paper No. 12497, August 2006, forthcoming in the Journal of the European Economic Association; and “Immigration and National Wages: Clarifying the Theory and the Empirics,” NBER Working Paper No. 14188, July 2008.

⁴ Net immigration was +0.4 percent of employment per year in the period 1990–2006.

⁵ 63 percent of immigrants had no tertiary education versus 59 percent of natives as of 2009.

⁶ For instance, the following influential papers: D. Card, “Immigrant Inflows, Native Outflows, and the Local Labor

Market Impacts of Higher Immigration,” Journal of Labor Economics 19, 2001, pp. 22–64; “How Immigration Affects U.S. Cities,” Discussion Paper No. 11/07, CreAM, London UK, 2007; and “Immigration and Inequality,” American Economic Review, Papers and Proceedings, 99, 2009, pp. 1–21.

⁷ G.J. Borjas, “Native Internal Migration and the Labor Market Impact of Immigration,” Journal of Human Resources, XLI, 2006, pp. 222–58.

⁸ G. Peri, “Rethinking the Area Approach: Immigrants and the Labor Market in California, 1960–2005,” NBER Working Paper No. 16217, July 2010, and Journal of International Economics, Vol. 84 (1), 2009, pp. 1–14.

⁹ The elasticity of substitution between immigrant and natives of similar skills is estimated between 10 and 20.

¹⁰ G. Peri G. and C. Sparber, “Task

Specialization, Comparative Advantages, and the Effects of Immigration on Wages,” NBER Working Paper No. 13389, September 2007, and American Economic Journal, Applied Economics, 1:3, July 2009.

¹¹ G. Peri, “The Effect of Immigration on Productivity: Evidence from U.S. States,” NBER Working Paper No. 15507, November 2009, forthcoming in the Review of Economics and Statistics.

¹² F. D’Amuri, G.I.P. Ottaviano, and G. Peri, (2010) “The Labor Market Impact of Immigration in Western Germany in the 1990s,” NBER Working Paper No. 13851, March 2008, and European Economic Review, Vol. 54, (4), 2010, pp. 550–70.

¹³ F. D’Amuri and G. Peri, “Immigration, Jobs, and Employment Protection: Evidence from Europe,” NBER Working Paper No. 17139, June 2011.

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Einav received his B.A. in Computer Science and Economics from Tel Aviv University and his Ph.D. in Economics from Harvard University. He joined Stanford’s faculty when he graduated from Harvard in 2002.

Einav’s areas of specialization are industrial organization and applied micro-

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Einav lives in Stanford, CA with his wife, Shirit, and their three children: Shiley, Yahli, and Libby.

