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IN THIS ISSUE

International Capital Flows Alter U.S. Interest Rates

There is a burgeoning literature on the impact of international capital flows on emerging market economies. For example, we have learned in recent years that in emerging markets foreign flows can result in a reduction in systematic risk and an increase in both physical investment and economic growth. These positive aspects of capital flows are tempered by the role of foreign flows in spreading crises.

In contrast, much less is known about the impact of capital flows on the larger economies of the world. And, until recently, many market participants held the view that capital flows could not possibly affect interest rates in the United States.

In **International Capital Flows and U.S. Interest Rates** (NBER Working Paper No. 12560), authors **Francis Warnock** and **Veronica Warnock** show that international capital flows have an economically important effect on the most important price in the largest economy in the world, that of the ten-year U.S. Treasury bond. Specifically, the authors ascertain the extent to which foreign flows into U.S. government bond markets can help to explain movements in long-term Treasury yields.

The authors address this issue at an important time. In the summer of 2003, short-term interest rates were very low and inflation was well contained. Over the course of 2004, the Federal Reserve began a well advertised tightening that raised short rates while economic growth strengthened and inflation picked up. Many market observers predicted an increase in long-term U.S. interest rates that would result in substantial losses on bond positions. However, long-term interest rates remained quite low, puzzling market participants, financial economists, and policymakers.

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The authors find that foreign flows have an economically large and statistically significant impact on long-term U.S. interest rates. Their work also suggests that large foreign purchases of U.S. government bonds have contributed importantly to the low levels of U.S. interest rates observed over the past few years. In the hypothetical case of zero foreign accumulation of U.S. government bonds over the course of an entire year, long rates would be almost 100 basis points higher. Were foreigners to reverse their flows and sell U.S. bonds in similar magnitudes, the estimated impact would be doubled. Further analysis indicates that roughly two-thirds of the impact comes directly from East Asian sources. In addition, some of the foreign flows owe to the recycling of petrodollars, suggesting a mitigating factor that might be reducing some of the bite of higher oil prices.

The authors caution that although they subjected their data to many robustness tests, it is possible that their results overstate the effects of foreign flows. One might suspect that other factors not completely captured by their analysis were affecting interest rates over this period. Still, the facts they present are suggestive of sizeable effects and are likely accurate given that foreigners currently hold more than half of the U.S. Treasury bond market.

— Les Picker

Black-White Test Scores: Neighborhoods, Not Schools, Matter Most

The large gap in student achievement, particularly between blacks and whites, has long troubled Americans. Fifty years after the *Brown v. Board of Education* decision, persistently large black-white differences in standardized test scores remain central to education policy.

In **Racial Segregation and the Black-White Test Score Gap** (NBER Working Paper No. 12078), NBER researchers **David Card** and **Jesse Rothstein** cast some fresh and perhaps surprising light on this issue. Using data from SAT records for roughly one third of test takers in the 1998–2001 high school graduation classes, they find that the black-white achievement gap is clearly linked to racial segregation.

To reach this conclusion, the authors match test-takers to information on the racial composition of their high schools and to an extensive set of family background characteristics of black and white students in their metropolitan areas. They compare the black-white achievement gap across areas with more- and less-segregated neighborhoods and schools. Within a metropolitan area, families living in integrated neighborhoods (and students attending integrated schools) may be different in a variety of unobserved ways from those in segregated neighborhoods and schools, confounding the effect of inter-racial exposure. The focus on across-area differences in segregation eliminates biases deriving from this sort of within-city sorting. Similarly, the focus on metropolitan-level black-white test score gaps removes the impact of a variety of omitted characteristics — potentially including school quality and resource levels — that do not vary within a city but might be correlated with inter-racial contact.

The results indicate that segregation has large, negative effects on black students' relative test scores. When a city is completely integrated, the gap in relative SAT scores between blacks and whites proves to be one quarter smaller (about 45 points) than in a city with the races fully segregated in different neighborhoods, holding family background characteristics constant.

> "In statistical models that include both school and neighborhood segregation, the effects of relative exposure of black and Hispanic students to their white schoolmates are uniformly small and statistically insignificant ... the neighborhood composition matters more than school composition."

The authors also attempt to distinguish between the effects of residential and school segregation. Considered separately, each appears to have a negative effect on the relative test scores and educational attainment of black students. In statistical models that include both school and neighborhood segregation, though, the effects of relative exposure of black and Hispanic students to their white schoolmates are "uniformly small and statistically insignificant." Although the authors acknowledge that the data could be consistent with equally negative effects of neighborhood and of school segregation, they write that, "Our tentative conclusion is that the neighborhood composition matters more than school composition."

These results — both the negative effects of segregation, and the indication that neighborhood segregation matters more than does school segregation — stand up in the face of a variety of statistical tests designed to rule out competing explanations. The segregation effects do not appear to be attributable to differential family background characteristics of black students living in more- and less-segregated cities, nor to resource differences between students' schools.

One potential explanation for the apparent lack of a school segregation effect is the prevalence of within-school segregation: if black students rarely attend class with white students even in cities with integrated schools, these cities may not post higher black test scores even though truly integrated education would have a positive effect. Indeed, the authors find a strong relationship between school integration and at least one proxy for classroom-level exposure: white students are more likely to take honors and advanced placement classes, which typically have few black students, in cities where the schools are integrated than in cities where schools are segregated. Although the authors have no way of measuring direct interactions between students of different races at school, this result suggests that school integration may not achieve high exposure rates of black to white students, potentially accounting for the lack of an integration effect on black students' test scores.

— David R. Francis

New Laboratory Procedures Increase Life Expectancy

Economists believe that the development of new products is the main reason why people are better off today than they were several generations ago. New goods are usually the result of investment in research and development (R and D), and data from the National Science Foundation reveal that the medical-equipment-and-supplies industry is one of the most research-intensive industries in the economy. The ratio of R and D expenditure to sales in that sector is two and a half times as high as in the average American industry.

In **The Impact of New Laboratory Procedures and Other Medical Innovations on the Health of Americans, 1990–2003: Evidence from Longitudinal, Disease-Level Data** (NBER Working Paper No. 12120), Research Associate **Frank Lichtenberg** examines the impact of a subset of the new products generated by this industry — clinical laboratory products — on the longevity and quality of life of Americans. Specifically, he measures innovation in five types of medical procedures or products: pathology and laboratory procedures, outpatient prescription drugs, inpatient prescription drugs, surgical procedures, and diagnostic radiology procedures.

The FDA data he uses indicate that about 100 of these new products have been introduced in the last decade. Lichtenberg hypothesizes that these new products have improved the quality of information that physicians and patients have about the patients' medical conditions, and therefore have enabled more appropriate and effective treatment of those conditions. Two new kinds of tests aptly illustrate this result: HIV tests; and, genetic tests related to dosing of a widely prescribed anti-blood clotting drug.

For almost two decades, HIV tests had two glaring flaws. They did not detect the earliest stage of infection, when people were more likely to spread the virus. And, they took days to produce results, so that many people never returned to learn whether they were infected. New generations of tests can largely eliminate either the long waiting time for results or the failure to find early infections.

Similarly, about two million Americans take warfarin (Coumadin) each day to help prevent blood clots because of problems like a heart attack, an abnormal heart rhythm, a stroke, or major surgery. Establishing the proper dose of warfarin when patients begin taking the drug is one of the trickiest problems in medical practice. Misjudgments in doses can critically affect the clotting mechanism, leading to potentially fatal bleeding. At present, doctors rely on costly blood tests that must be repeated frequently over a period of months to adjust the dose and ensure that the drug will work safely. But a recent study suggests that it may be possible to develop a standard genetic test that would allow doctors to quickly and precisely choose a safe starting dose of warfarin. That would have significant treatment and health implications.

Lichtenberg finds that medical conditions with higher rates of innovation in lab procedures and outpatient drugs experienced larger increases in the mean age at death, after controlling for other medical innovation rates and the initial mean age at death. The increase in mean age at death attributable to the use of new lab procedures between 1990 and 1998 is estimated to be about 6 months. This represents 42 percent of the total increase in mean age at death (1.18 years) in the sample of diseases studied here.

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The new laboratory procedures introduced during 1990–8 are estimated to have saved 1.13 million life-years in 1998. The expenditure per life-year gained from the new lab procedures is estimated to be $6,093. So, treatments that cost this amount generally are considered to be quite cost-effective.

The 1998 data used here come from 92 firms. The people covered by these firms' health plans used about 22 million outpatient and inpatient lab, surgical, drug, and diagnostic radiology procedures. The total cost of these procedures was $1.94 billion. The average cost of new lab procedures was only $1 higher than the average cost of old lab procedures ($24). For other types of procedures, the average cost of new procedures was anywhere from 1.8 to 11 times higher than the average cost of the old procedures. Lab procedures accounted for 60 percent of the total number of procedures performed, but for only 17 percent of the total expenditure on these procedures.

— Les Picker

The Career Effects of Graduating in a Recession

In the first ten years of work, individuals experience 70 percent of their overall wage growth, change jobs frequently, and often settle on a particular line of business or industry. Those college graduates who enter a robust job market are often considered lucky because more job opportunities are available to them. Those who graduate during a recession have more difficulty finding a job that fits. But, how long lasting is the impact of that good or bad luck? In **The Short- and Long-Term Career Effects of Graduating in a Recession: Hysteresis and Heterogeneity in the Market for College Graduates** (NBER Working Paper No. 12159), co-authors **Philip Oreopoulos, Till von Wachter,** and **Andrew Heisz** turn to three large administrative data sets for some answers.

They analyze data on about 70 percent of Canadian college students and graduates from a wide range of disciplines in the years 1976–95, and individual income tax records and payroll information from 1982–99. The data also include information on the students' courses of study, their annual earnings, and other aspects of their employment or unemployment, including information on the characteristics of the workers' employers early in their careers. The period under study encompasses two distinct recessions.

The researchers first analyze the long-term effect on earnings of a typical recurring shock — an economic downturn — affecting a large group of workers. Then they use the information on employment, job mobility, and employer characteristics over a 10-year period to assess the sources of persistent effects of early labor market conditions. Finally, information about the individual's academic program allows them to investigate whether workers predicted to be less advantaged from the outset actually suffer larger long-term losses and adjust differently to an initial shock.

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There are three central findings in this study. First, luck matters, because graduating in a recession leads to large initial earnings losses. These losses, which amount to about 9 percent of annual earnings in the initial stage, eventually recede, but slowly — halving within five years but not disappearing until about ten years after graduation. Second, initial random shocks affect the entire career. Graduating in a recession leads workers to start at smaller and lower paying firms, and they catch-up by switching jobs more frequently than those who graduate in better times. Third, some workers are more affected by luck than others. In particular, earnings losses from temporarily high unemployment rates are minimal for workers with two or more years of work experience and are greatest for labor market entrants. Among graduates, those with the lowest predicted earnings suffer significantly larger and much more persistent earnings losses than those at the top.

The results suggest that changes in the quality of jobs and job mobility are important in explaining the long-term effects of bad luck for those graduating in a recession. For example, Oreopoulos, von Wachter, and Heisz note that mobility among jobs and industries initially will rise and then, gradually, will decline in response to an initial adverse shock — this implies that graduating from college in a recession reduces the quality of initial employment. However, moving from job to job proves to be highly productive for young graduates, and this is even more the case for workers affected early on by restricted job markets. The subsequent increased job search can explain about 30 percent of the reversion in initial wage losses, the authors find.

They also find that recessions lead workers to start out with employers that are smaller on average and pay less. The data suggest that declines in the size and average wages of first employers of young college graduates could explain about 30-40 percent of the initial wage losses from starting a career in a recession. Labor market entry in bad times leads to less desirable job placement, or mismatches of workers into firms, and workers catch up by searching for and getting themselves into more desirable firms.

Oreopoulos, von Wachter, and Heisz further find that college graduates at the bottom of the wage-and-ability distribution experience larger and more persistent losses, while for those at the top the effects are small and short-lived. The researchers believe that the (present

discounted value of) losses in annual earnings could be three to four times larger for the least relative to the most advantaged workers. This suggests an even larger degree of dispersion in the costs of recession, even within the group of college graduates. The patterns discerned in the data support the importance of job mobility and changes in firm quality, the authors conclude, with the exception of those least advantaged, who suffer permanent earnings losses and are permanently relegated to lower wages.

— Matt Nesvisky

Will Super-High Chinese Growth Continue?

With an average annual increase in GDP over the last two decades of more than 9 percent, China's economic development has been nothing short of spectacular. But such astonishing growth inevitably inspires the perennial question: How long can China keep it up? In **China's FDI and Non-FDI Economies and the Sustainability of Future High Chinese Growth** (NBER Working Paper No. 12249), coauthors **John Whalley** and **Xian Xin** attempt to answer the question with data supplied by the National Bureau of Statistics of China. They consider, in particular, the roles of what they call two distinct sub-economies. One involves the mainly manufacturing-based Foreign Invested Enterprises (FIEs), which are often joint ventures between Chinese enterprises (usually state-owned) and overseas companies supplying Foreign Direct Investment (FDI), product designs, and international sales networks. The second sub-economy is the non-FIE portion of China's economy in manufacturing, agriculture, and services.

The two sub-economies are of course related, but quite different. FIEs employ only 24 million workers out of a total workforce of 752 million, and their labor productivity is around 9 times that of the workers in the non-FIE sub-economy. The FIEs account for over half of exports and 60 percent of imports. Industrial FIEs are responsible for over 30 percent of China's industrial output. Also, FIEs are concentrated in Southern and Eastern China, intensifying any inequality that results from rapid growth. The FIE sub-economy currently is growing at around 18 percent per year, while the non-FDI portion is growing at about 5–6 percent annually. This suggests that if FDI inflows level off (as appears to have happened in 2005), the sustainability of Chinese growth in the 7–10 percent range may be doubtful.

In dollar terms, annual FDI inflows to China were less than $2 billion in 1985, but had ballooned to $61 billion by 2004. Between 1985 and 1991, the annual growth rate of FDI inflows into China was 14 percent, and during those years annual FDI inflows remained less than $4.5 billion. But in 1992 the FDI inflows had jumped to $11 billion, and in the following year they leaped again to $28 billion, with growth rates of over 150 percent in both years. By 1997, China had FDI inflows of $49 billion.

In subsequent years world FDI inflows declined markedly, but China's FDI inflows continued to grow. Global FDI inflows bounced back to show 2 percent growth in 2004, while China showed an inward FDI growth rate of 13 percent. China's FDI inflows fall into two categories: horizontal FDI, which involves the transfer of production (mainly from North America and Western Europe) to service the Chinese internal market; and vertical FDI, which takes advantage of low-cost production in China for products to be exported and which is fueled mostly by China's Asian neighbors.

Whalley and Xin's analysis indicates that while the FIE sub-economy is still only 20 percent of China's total economy, it nonetheless accounts for over 40 percent of China's recent economic growth. This part of the Chinese economy thus has substantial implications for the sustainability of the country's future economic growth. However, whether rapid

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growth will continue depends on both continued growth in inward FDI and access to international export markets. While China's FDI inflow growth rate has averaged over 10 percent since 2002 (and China's association with the World Trade Organization), the authors' believe that the figures for 2005 are likely to show a leveling off, or even a slight decline, not least because FDIs have been moving to other low-wage countries.

China's WTO commitments imply both capital market liberalization (in banking) and further progress on commitments on rule-based WTO issues. Such changes will help to attract more FDI. Yet China's rapid export growth raises concerns about the continued absorptive capacities of the Organization for Economic Co-operation and Development. China's share of world exports is now around 6 percent and, with a 35 percent growth rate in exports, is doubling every three years. Continued FDI flows thus may also encounter problems here if they are export-oriented. China's large trade surplus with the EU and the United States also fuels protectionist pressures.

The researchers say an additional concern is whether regional disparities within China will continue along with inward FDI. About 84 percent of China's inward FDI occurs in nine coastal provinces, leaving the remaining 20 provinces with 12 percent of inward FDI and resulting in great disparities in income. If growing inequality constrains growth, continued FDI flows could worsen matters. It remains to be seen whether the non-FIE portion of the economy can generate higher growth to compensate for the slowing growth in the FIE sub-economy.

In sum, a leveling-off or falling of FDI, limits to FDI diversification from other non-OCED countries, and continued growth of exports all raise cautions for continued high growth in China. These negatives are counterbalanced to a degree by an ever-improving policy environment for FDI in China, but this in itself seems unlikely to support still more FDI growth into China. Whalley and Xin strongly suspect that more robust growth from the non-FIE sub-economy will be needed to compensate for further lagging growth performance from FIEs.

— Matt Nesvisky

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