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House Prices, Home Equity-based Borrowing, and the U.S. Household Leverage Crisis

In **House Prices, Home Equity-based Borrowing, and the U.S. Household Leverage Crisis** (NBER Working Paper No. 15283) co-authors **Atif Mian** and **Amir Sufi** examine individual home equity appreciation and household borrowing decisions from 2002 to 2006 and their relationship to the subsequent rise in mortgage defaults from 2006 to 2008. They find that homeowner leverage played an important role in the financial and economic downturn of recent years.

This study analyzes a dataset provided by a national consumer credit bureau. The dataset consists of roughly 70,000 anonymous individual homeowner credit files from the end of 1997 through 2008. It includes samples from every major U.S. metropolitan statistical area.

The researchers find that between 2002 and 2007, the debt-to-income ratio for U.S. households roughly doubled, reaching its highest level in over 25 years. They esti-

mate that home equity-based borrowing averaged 2.8 percent of GDP between 2002 and 2006, totaling \$1.45 trillion. That home

equity borrowing explains roughly one third of new defaults in the 2006–8 period.

The rapid expansion in household leverage was due in part to the strong, steady house price appreciation that had taken place since the late 1990s, and particularly since 2002, and by the ready availability of mortgage credit—in particular to an increasingly risky set of new, first time home buyers. That group includes younger households, households with low credit scores, and households with high initial credit card utilization rates.

The authors estimate that the average homeowner increases spending by between 25 and 30 cents for

every dollar of home equity borrowing. Much of the spending is directed to consumer goods and services and to home improvements.

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Borrowing against rising home equity was accompanied by a relative decline in default rates from 2002 to 2006, especially for low-credit-score and high-credit-card-use homeowners. But when the overall default rates began to rise in 2006, the default rates of homeowners who experienced steep house price appreciation from 2002 to 2006 rose much faster than those of homeowners who had not experienced such appreciation. The rise in default rates was especially strong among low-credit-score and high-credit-card-use homeowners who borrowed most aggressively against rising home equity during the housing boom. Those same house-

holds also reduced their auto loans between 2006 and 2008, highlight-

ing the link between homeowner leverage and the demand for con-

sumer durable goods.

— Frank Byrt

Capital Market Integration and Wages

In **Capital Market Integration and Wages** (NBER Working Paper No. 15204) authors **Peter Blair Henry** and **Diego Sasson** find that in the three years that follow a typical developing country opening its stock market to inflows of foreign capital — that is, a capital market liberalization — the average annual growth rate of the real wage in the manufacturing sector increases substantially. This temporary increase in wage growth drives up the level of the average worker’s annual compensation by \$609, or 25 percent of the workers’ annual salary before the capital market liberalization. The growth rate of labor productivity increases even more than the growth rate of real wages, so rising worker incomes coincide with rising profitability of the manufacturing sector.

Henry and Sasson study patterns of wages, employment, and output in 18 developing countries that opened their stock market to foreign investment at some stage between 1986 and 1995. They compare these countries to a control group of countries whose markets

did not open. They also collect data on privatization, stabilization, and trade reforms implemented in some

“Real wage growth averages between 5.1 and 8.6 percent more than its long-term average in the years immediately after capital market liberalization.”

of the countries during the period so that they can more precisely estimate the effect of liberalization reforms.

The authors note that opening capital markets reduces the cost of capital. This provides a strong incentive for manufacturing firms to increase investment. Workers benefit from this additional investment because their productivity increases. Firms step up their demand for more productive labor and drive up manufacturing wages.

Henry and Sasson find that real wage growth averages between 5.1 and 8.6 percent more than its long-term average in the years immediately after capital market liberalization. Productivity growth increases by more than 10 percent per year. Capital market liberalization only explains about half of the increase

in real wage growth — the adoption of new technology may account for most of the rest. The authors note

that more integrated capital markets can facilitate the diffusion of technologies to less developed countries. By importing better equipment and machinery, firms can increase the productivity and efficiency of all production inputs, including labor.

Henry and Sasson’s results suggest that trade in capital has a profound effect on wages in developing countries. Capital trade increases the rate of wage growth, and it may also provide clues for explaining deepening wage inequality in developing countries. As firms import more new machinery, they demand more skilled labor at higher wages. This concern notwithstanding, the authors conclude that “increased capital market integration raised the average standard of living for a significant fraction of the workforce in developing countries.”

— Alexander Teytelboym

Conditional Cash Penalties in Education

In the mid-1980s, Wisconsin began exploring ways to give welfare recipients incentives to work more and to receive a better education. For example, the Learnfare program sought to break the cycle of welfare dependency by giving families greater incentives to monitor teen behavior. When teenagers who were part of this program failed to attend school, their families' welfare payments were reduced by \$60 to \$190 a month.

In **Conditional Cash Penalties in Education: Evidence from the Learnfare Experiment** (NBER Working Paper No. 15126), **Thomas Dee** finds that the Learnfare penalties worked: they increased school enrollment by 3.7 percent and school attendance by 4.5 percent. For students with the highest risk of dropping out, Learnfare increased school enrollment by 25 percent.

Earlier analysis using a ten-county, random-assignment study of Learnfare found that it had "at best modest and short-term effects on its

stated enrollment and attendance outcomes." However, Dee concludes that those results were driven

"Wisconsin's program that reduced families' welfare payments when their teenagers failed to attend school increased school enrollment and school attendance by more than 3 percent."

largely by the inclusion of data from Milwaukee County, where the random-assignment methodology was poorly implemented. Although eligible participants were supposed to be randomly assigned to either the Learnfare program or regular welfare, in Milwaukee County black teenagers were significantly less likely to be subjected to Learnfare's restrictions than other teenagers.

The Milwaukee County results were complicated by the poor quality of the data systems in Milwaukee County schools. According to a 1995 review, even when sanctions were applied for poor attendance, Milwaukee County took more than twice as long to apply them. When Dee re-examines the data from the

Learnfare experiments without the Milwaukee County information, he finds much larger and statisti-

cally significant effects of Learnfare on both enrollment and student attendance.

Dee also argues that Learnfare has several unique design features that distinguish it from other programs that provide financial incentives to students. For example, instead of rewarding individual students, it leverages family involvement by sanctioning the family's welfare grant. Furthermore, because it sanctions a grant rather than providing a reward for performance, Learnfare may take advantage of the unique aversion that people typically demonstrate to income losses relative to income gains.

—Linda Gorman

Automobiles on Steroids

In the United States, the transportation sector accounts for

more than 30 percent of greenhouse gas emissions. Yet Corporate

Average Fuel Economy (CAFE) standards for passenger cars have

not increased since 1990; for light trucks and SUVs, they have increased by only 10 percent in that period.

From 1980 to 2004 the fuel economy of U.S. vehicles has remained stagnant despite apparent technological advances. The average fuel economy of the U.S. new passenger automobile fleet increased by less than 6.5 percent, while the average horsepower of new passenger cars increased by 80 percent, and their average curb weight increased by 12 percent. For light duty trucks, average horsepower has increased by 99 percent and average weight increased by 26 percent over this period. But there's more to this story: in 1980, light truck sales were roughly 20 percent of total passenger vehicles sales — in 2004, they were over 51 percent.

In Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector (NBER Working Paper No. 15162), **Christopher Knittel** analyzes the technological progress that has occurred since 1980 and the trade-offs that manufacturers and consumers face when choosing between fuel economy, weight, and engine power characteristics. His results suggest that if weight, horsepower, and torque were held at their 1980 levels, fuel economy for both passenger cars and light trucks could

have increased by nearly 50 percent from 1980 to 2006. Instead, fuel economy actually increased by only 15 percent.

Furthermore, once technological progress is considered, meeting

“If weight, horsepower, and torque were held at their 1980 levels, fuel economy for both passenger cars and light trucks could have increased by nearly 50 percent from 1980 to 2006. Instead, fuel economy actually increased by only 15 percent.”

the CAFE standards adopted in 2007 requires halting the observed increases in weight and engine power characteristics, but little more. In contrast, the standards recently announced by the new administration are certainly attainable but will require non-trivial “downsizing.”

Knittel finds that U.S. manufacturers tend to be above the median in terms of their passenger vehicle fuel efficiency, conditional on weight and engine power, and are among the top for light duty trucks. However, over time the U.S. manufacturers' relative fuel efficiency in both passenger cars and light trucks has degraded. Using vehicle model-level data for automobiles offered in the United States from 1980 to 2006, Knittel concludes that the passenger car fleet manufactured by Honda is the most fuel efficient of any manufacturer. Volvo manufactures the most fuel-efficient fleet of light-duty trucks.

These results shed some new light on the CAFE standards adopted by both the Bush and Obama administrations. They suggest that the Bush CAFE standards would have done little to push

manufacturers and consumers to smaller, less powerful cars or away from SUVs and back into passenger cars. In contrast, the Obama standards will require shifts to smaller, less powerful cars and fewer SUVs.

Knittel's estimates of manufacturers' relative ability to obtain fuel economy, conditional on weight and engine power, suggest that U.S. manufacturers are relatively successful at achieving such economy in the production of passenger cars. While Honda, Toyota, and Nissan all perform well, GM outperforms Nissan, and Ford outperforms most non-Japanese manufacturers. In addition, when considering light trucks, GM outperforms all three Japanese manufacturers for fuel efficiency conditional on vehicle characteristics, and Ford trails only Honda.

— Lester Picker

Medical Licensing Board Characteristics and Physician Discipline

State medical licensing boards vary in their composition, their sources of funding, and their propensity to discipline physicians. From 1963–7 they disciplined about 0.06 percent of all licensed physicians in any given year. In 1981, the rate was 0.14 percent. By the mid-1990s, when more than 80 percent of physicians were affiliated with a managed care organization, the disciplinary rate had increased eight-fold.

In **Medical Licensing Board Characteristics and Physician Discipline: An Empirical Analysis** (NBER Working Paper No. 15140), co-authors **Marc Law** and **Zeynep Hansen** conclude that the medical board reforms created by the growth of managed care in the 1990s were so substantial that additional reforms aimed at improving the function of medical boards—by increasing the

degree of political or public oversight over them—may not result in stricter regulation of physician

“The advent of managed care in the 1980s and 1990s increased scrutiny of the medical profession to such an extent that... the medical establishment found it in its own self-interest to monitor doctors more carefully.”

conduct. The researchers argue that the advent of managed care in the 1980s and 1990s increased scrutiny of the medical profession to such an extent that “Medical boards and physician groups became more concerned with protecting the reputation of the medical profession and the quality of medical decisions. Accordingly, the medical establishment found it in its own self-interest to monitor doctors more carefully.”

Using data from the Federation of State Medical Boards on the num-

ber of disciplinary actions per 1,000 licensed physicians from 1993 to 2003, the authors find no evidence

to support the assertion that physician dominated boards are less likely to discipline physicians, or that having more medical board members who are not physicians makes physician discipline more likely. Boards that receive state funds are no more likely to discipline physicians than are boards that are independently funded. In fact, the authors conclude that organizational autonomy is associated with higher rates of physician discipline.

— Linda Gorman

Global Savings and Investment

In **Global Savings and Global Investment: The Transmission of Identified Fiscal Shocks** (NBER Working Paper No. 15113), **James Feyrer** and **Jay Shambaugh** investigate how changes in U.S. fiscal pol-

icy diffuse through the world economy. They find that almost half of any change in U.S. policy will spill over to overseas economies. The authors arrive at their conclusions by looking at macroeconomic data

for 113 countries between 1973 and 2005. They also cite previous research (NBER Working Paper No. 13264 by Christina D. Romer and David H. Romer), which identifies the motivation of all major

tax changes since World War II, based on government documents and speeches. This approach allows them to single out tax changes that are unrelated to prospective economic conditions.

Feyrer and Shambaugh find that if U.S. taxes rise unexpectedly without an accompanying increase in government spending, then private savings will fall by only a third of the tax increase. The U.S. current account—the difference between aggregate saving and investment—will rise by half of the tax increase. Global equilibrium requires that a rise in the U.S. current account correspond to a decline in the current account balance for the rest of the world. Thus, a tax increase that raises government saving in the United States causes the rest of the world's current account balance to fall, and

increases U.S. lending to the rest of the world relative to the pre-tax setting.

“If U.S. taxes rise unexpectedly without an accompanying increase in government spending, then the U.S. current account—the difference between aggregate saving and investment—will rise by half of the tax increase”

The authors carefully explore the nature of the current account deficits in the rest of the world that are caused by shifts in U.S. fiscal policy. They point out that it is the movement of investment, not of saving, that drives changes in the current account in the rest of world. Changes in U.S. taxes appear to have similar effects on investment in developed and developing countries and on those with various currency regimes. Even economies with tight capital controls feel the effect of U.S. fiscal policy.

Higher tax rates in the United States are often thought to put brakes on the growth of the world

economy. Feyrer and Shambaugh point out that this may not necessarily be the case because higher investment may mitigate this effect. The authors warn about using this argument in the current financial crisis, though, because their predictions are made for an economy operating at full capacity. In their setting, fiscal policy does not respond to current economic conditions. “This is clearly not the case with fiscal policy in the first half of 2009,” they write.

— Alex Teytelboym

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