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INSIDE THIS ISSUE

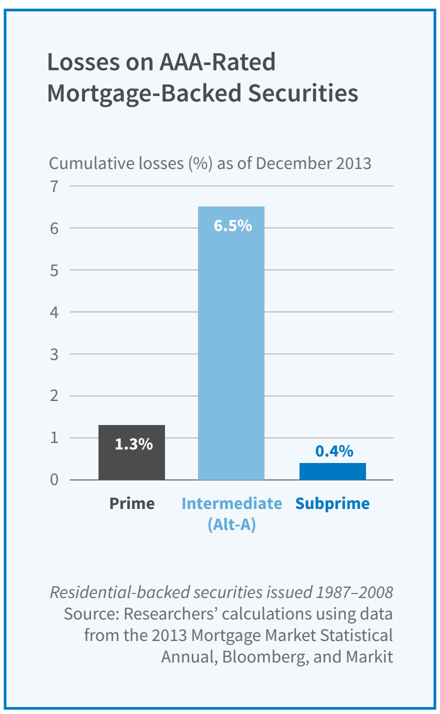
Evaluating the Role of Credit Ratings in the 2008 Crisis

New evidence on the performance of non-agency residential mortgage-backed securities (RMBS) during the 2007–13 period casts doubt on the ubiquitous claim that the 2008 financial crisis was triggered by over-extension of mortgage credit and a failure of rating agencies to recognize the associated risks to investors.

Non-agency RMBS are backed by mortgages that do not qualify for guarantees issued by agencies of the U.S. government. Examples of such loans are "jumbo" mortgages that exceed the value limit for guarantees, those with a high loan-to-value ratio, and those lacking the documentation needed for agency backing. From 1987 through 2013, various lenders issued about $5.8 trillion in non-agency RMBS. A common narrative for the start of the financial crisis suggests that credit agencies downplayed the riskiness of RMBS, drawing in lenders who did not appreciate their intrinsic risk. Some also claim that ratings were less accurate in the subprime market than elsewhere.

In **Mortgage-Backed Securities and the Financial Crisis of 2008: A Post Mortem** (NBER Working Paper No. 24509) Juan Ospina and Harald Uhlig examine new data on the prices of non-agency RMBS. They find that total losses in the non-agency RMBS market through December 2013 were less than $350 billion, about 6.5 percent of their pre-crisis market value. Subprime AAA-rated securities performed well compared to securities in other market segments. Some categories of non-agency RMBS generated rates of return between 2.4 and 3.3 percent at a time when 10-year Treasuries yielded between 3 and 4 percent. These findings challenge the view that improperly rated RMBS were a major contributor to the financial crisis.

> Falling prices for mortgage-backed securities contributed to the 2008–9 financial market turmoil, but the AAA-rated subprime segment performed better than other market segments.



Residential-backed securities issued 1987–2008
Source: Researchers' calculations using data from the 2013 Mortgage Market Statistical Annual, Bloomberg, and Markit

The researchers study 8,615 deals to securitize non-agency RMBS from 1987 through 2008. The securities created by those deals are tracked through 2013. Almost 87 percent of the securities issued were AAA-rated. These had almost no losses before 2003. In contrast, the cumulative losses for securities issued between 2006 and 2008 were around 2.3 percent for the entire portfolio of AAA-rated non-agency RMBS, compared to their originally promised payouts.

While one might consider these losses substantial relative to historical losses for that rating class, the subprime AAA-rated segment outperformed the AAA-rated market as a whole. The subprime AAA segment experienced a principal-weighted loss rate of 0.42 percent on average, and there was no increase in loss rates for subprime-based AAA securities issued in 2006–8. Losses were higher in other rating segments. For example, in the $53 billion non-investment grade, non-agency RMBS market, which comprised about 1 percent of the total non-agency market, the loss rate exceeded 50 percent.

The researchers find that 75 percent of the AAA-rated securities had practically no losses until the end of 2013 and thus, in hindsight, deserved their rating so far. They find more evidence of inflated ratings for weaker securities. For securities with a rating of A or below, they conclude that there was a high fraction of inflated ratings. They point out, however, that these securities represented only a small part of the RMBS market.

— Linda Gorman

Access to New Global Markets Pushes Best Firms to Get Better

Economic theory identifies two effects of a positive export shock that increases access to new international markets. On the one hand, access to a larger market could increase a firm's incentive to innovate because larger markets promise larger innovation rents. On the other hand, the larger market could attract new entrants, increasing competition, reducing both profits and innovation rents, and thus discouraging innovation. The relative magnitudes of these effects in any given market setting is an empirical question.

In **The Impact of Exports on Innovation: Theory and Evidence** (NBER Working Paper No. 24600), Philippe Aghion, Antonin Bergeaud, Matthieu Lequien, and Marc J. Melitz explore this issue. They find that for high-productivity firms, those close to the productivity frontier, the positive effect of greater market size on innovation is larger than the negative competition effect. For those firms, positive export shocks are associated with an increase in the number of patent applications filed. Among less productive firms, the competition effect, which discourages innovation, appears to dominate. For these firms, positive export shocks are associated with a decline in innovation.

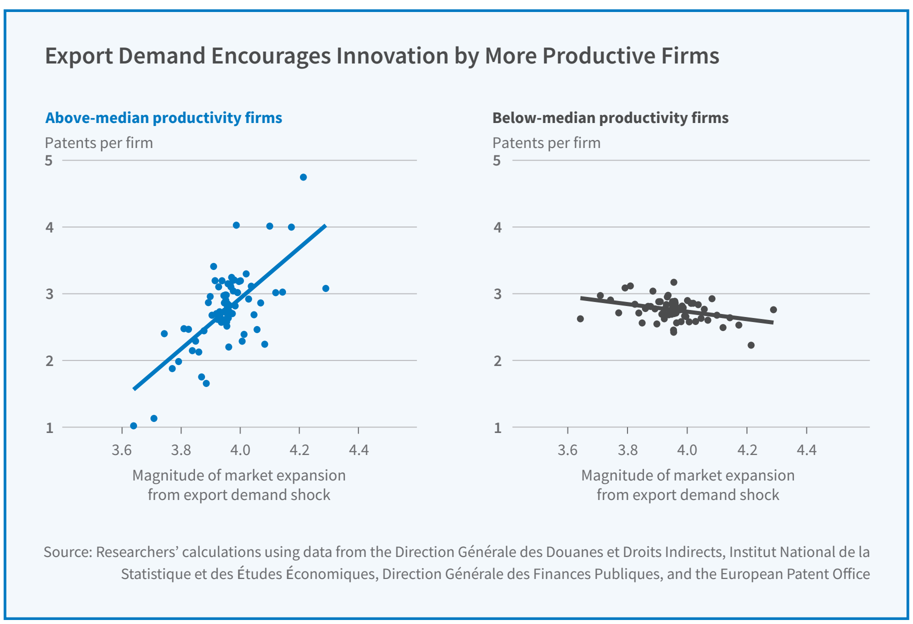
For high-productivity firms, export shocks that provide access to an expanded market lead to greater innovation, even though such shocks may also bring new competitors.

The researchers develop these findings by analyzing linked data on patents, customs, and production among French manufacturing firms over the period 1994–2012, a period during which trade liberalization resulted in significant export shocks.

They find that "exporters are substantially more likely to innovate, and innovators are more likely to export." Only five percent of innovative firms report no exporting, while most are large exporters. Innovative exporters employ 4.5 times more workers, produce about eight times more output, and export to three times as many destinations as non-innovative exporters. These differences are not accounted for by differences in the sectors in which high- and low-innovation firms operate.

The relationship between export share and innovation is particularly dramatic at the high end of the export distribution. "Above the 95th percentile of the export distribution, a majority of firms are innovators; in the top percentile, 68 percent of the firms are innovators," the researchers write. "Those firms in the top export percentile account for 41 percent of the aggregate share of French patents."

— Dwyer Gunn



The Spillover Effects of International Joint Ventures in China

When foreign firms set up joint ventures in China, there are spillover effects on many Chinese firms, not just those involved in the new joint ventures. The other firms often gain new technology and become more productive. These benefits typically outweigh the negative effect of increased competition that the joint venture represents, according to findings reported in **International Joint Ventures and Internal vs. External Technology Transfer: Evidence from China** (NBER Working Paper No. 24455).

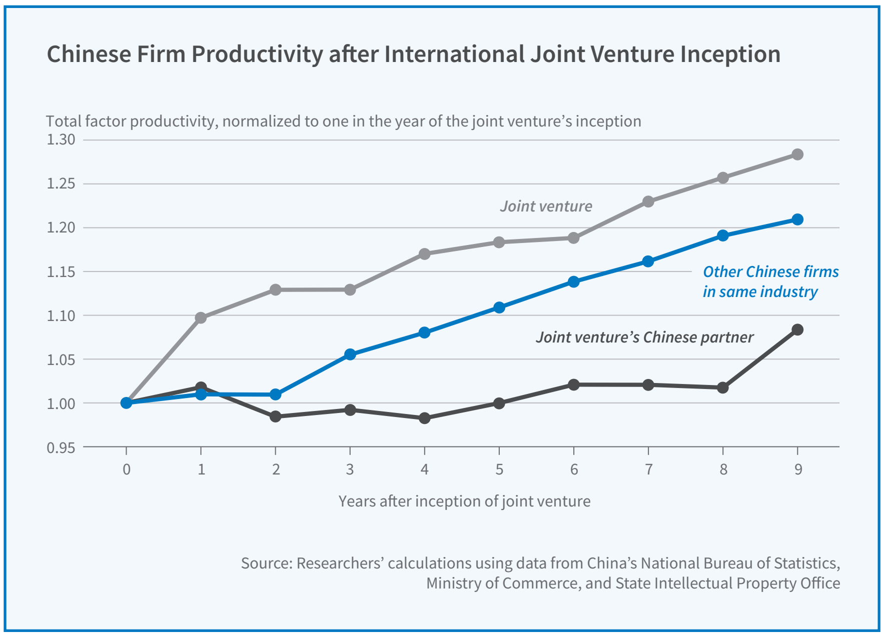
The overall benefits to Chinese firms from international joint ventures are larger than those from other types of foreign direct investment (FDI), such as wholly owned foreign enterprises. And the benefits are larger if the foreign partner is from the United States rather than from Japan, Hong Kong, Macau, or Taiwan.

“U.S. partners roughly double the productivity gains of joint ventures, relative to non-U.S. foreign partners,” write Kun Jiang, Wolfgang Keller, Larry D. Qiu, and William Ridley. “One explanation for this is that U.S. firms tend to be closer to the world’s technology frontier than non-U.S. firms, and as a consequence they transfer more (or better) technology to their Chinese joint venture.”

The popularity of international joint ventures in China has waned in recent years, likely because wholly owned foreign enterprises appear to be better equipped to safeguard their intellectual property and other proprietary technologies from dissemination to domestic firms. In 1997, equity joint ventures represented 43 percent of FDI while wholly owned foreign enterprises accounted for 35.8 percent. By 2007, equity joint ventures accounted for only 19 percent while wholly owned foreign enterprises represented 77 percent. In some industries, China’s foreign investment policy requires foreign firms to partner with a local business.

Productivity rises at Chinese firms in the same industry as a new joint venture, especially when the international partner is from the United States.

However, international joint ventures remain an important source of FDI. In 2015 alone, foreign companies set up slightly more than 6,000 new joint ventures in China, accounting for $27.8 billion of FDI.



By matching official international joint venture listings with enterprise data from China’s National Bureau of Statistics and patent applications from its State Intellectual Property Office, the researchers examine all the domestic partner firms with annual sales of at least 5 million renminbi operating at any point between 1998 and 2007. They find that foreign investors tend to partner with large, profitable, highly productive firms operating in labor-intensive or high-tech manufacturing industries. The Chinese partners also tend to have a strong export base, a portfolio of patents, or government subsidies.

International joint ventures are some 30 percent more productive than Chinese firms that are not joint ventures, and generate patents at a 2.2 percent higher rate. The Chinese partner firms in these ventures also benefit from these ventures in their business units that are not part of the joint venture, with 5 percent higher productivity and 0.8 percent more patenting. This effect is smaller than for the business unit that involves the joint venture, in part because there is no incentive for the foreign firm to transfer technology to the partner company and partly because the partner is generally large, so productivity improvements would have a relatively smaller effect than for the joint venture itself.

When the researchers test for spillovers from joint ventures to other Chinese firms in the same industry, they find the largest effects for companies that are also engaged in joint ventures.

—Laurent Belsie

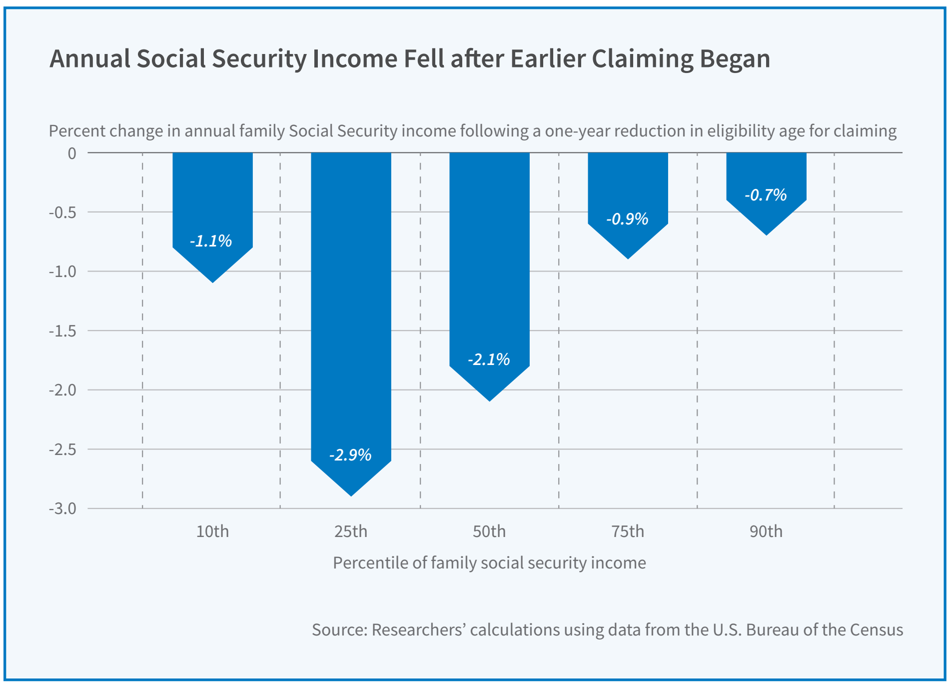
Early Social Security Claiming and Poverty among Elders

Policy debates about how to reduce the projected divergence between currently promised Social Security benefits and the revenues that the system is expected to receive often include discussion of raising the minimum retirement age. In recent years, Australia, Austria, Germany, the United Kingdom, and other developed nations have raised the minimum age of early retirement. A new study examines how a decrease in the U.S. minimum claiming age, enacted in 1961, affected the living standards of retirees.

The option for early retirement created by the Social Security Act amendments of 1961 lowered the minimum age at which individuals could claim benefits to 62. The benefits paid to an individual beneficiary were adjusted to reflect the age at which they began to be paid. Claiming earlier reduced an individual's annual benefits relative to what they would have been if the individual had claimed at the normal retirement age, which was then 65.

Gary V. Engelhardt, Jonathan Gruber, and Anil Kumar, in the study **Early Social Security Claiming and Old-Age Poverty: Evidence from the Introduction of the Social Security Early Eligibility Age** (NBER Working Paper No. 24609), find that the change in the claiming age resulted in an average decrease of 1.5 percent in Social Security income for male-headed families. The change was associated with a decrease in total income for the poorer half of households, and a large rise in elder poverty and income inequality.

Lowering of the minimum claiming age in 1961 reduced average monthly income and increased the poverty rate in old age for male-headed households.



The researchers compare men who retired before and after the decline in the minimum claiming age, in particular those born between 1885 and 1916. They find that the option to retire early proved so popular that the average age of claiming benefits fell by 1.4 years. The most common age for claiming benefits became 62. This led to a median reduction in Social Security income of 3 percent for male-headed families; for those at the 25th percentile of the Social Security income distribution, the decline was 4 percent.

Lower Social Security income was associated with lower total income, but only for those in the bottom half of the income distribution. A $1,000 boost in benefits was linked to a 6.7 percentage-point decrease in the poverty rate.

The reduction in the early retirement age coincided with a period of increasing generosity of Social Security benefits overall. Thus, the rise in the level of benefits in part offset the reduction for any individual who claimed early. The researchers point out that this is an important consideration when trying to project the impact of future policy changes.

— Laurent Belsie

Forced Migration Associated with Preference for Education

It has long been theorized that people who are forced to migrate invest heavily in education, a portable asset that will not be lost if a second expulsion occurs, and that this pattern persists for generations. But this hypothesis has been difficult to test because there are often confounding factors that affect forced migrants. They frequently differ from natives of their new homeland in characteristics such as ethnicity, language, and religion.

In **Forced Migration and Human Capital: Evidence from Post-WWII Population Transfers** (NBER Working Paper No. 24704), Sascha O. Becker, Irena Grosfeld, Pauline Grosjean, Nico Voigtländer, and Ekaterina Zhuravskaya avoid the usual confounding factors by studying the descendants of Poles who were expelled from Kresy, the eastern borderlands of Poland, when the Soviet Union acquired that territory in the aftermath of World War II. Those Polish forced migrants were resettled to central Poland and into the newly acquired Western Territories of Poland, which were taken over from Germany. Thus, Poles from Kresy subsequently lived with other Poles who were not forced to migrate, and who had the same ethnic, linguistic, and religious background.

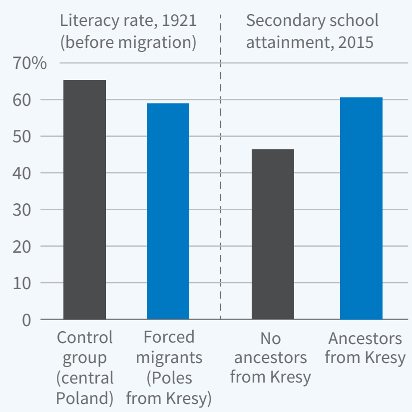
The researchers find that on average, the descendants of the Kresy Poles are today significantly more educated than the descendants of other Poles. Averaging across the children, grandchildren, and great-grandchildren of the Kresy migrants, they find that descendants of the forced migrants have received one additional year of schooling. This finding holds even within municipalities, when comparing neighbors with and without roots from Kresy.

The researchers point out that the Polish Kresy population was less educated than other Poles before the war, so the more recent pattern represents a reversal of the historical one. They consider, but reject, the possibility that differential out-migration, selection into destinations, fertility, or labor market congestion could explain the higher education of descendants of those forced to migrate from Kresy. In addition, the findings hold within a narrow corridor around the hypothetical Kresy border.

The study uses data from the Diagnoza Survey, Poland's primary survey of the conditions of Polish life, supplemented with an ancestry survey that the researchers conducted in 2016. The survey gathered data on over 13,000 ancestors of 4,069 Poles living in Poland's Western Territories.

> Among Poles, the descendants of post-WWII forced migrants today have higher average education and incomes than those whose ancestors were not displaced.

Literacy Rate and Educational Attainment for Forced Migrants and Their Descendants



Source: Researchers' calculations using data from the 1921 Polish Census and the 2015 Diagnoza Survey

The descendants of forced migrants from Kresy are the most educated sub-group of Poles. They are followed by descendants of Poles who voluntarily moved from central Poland to the largely empty Western Territories after WWII. This suggests that forced migration has a stronger impact on the desire to invest in education than voluntary migration. The descendants of Kresy migrants are 12.7 percentage points more likely to finish secondary education and 9.9 percentage points more likely to graduate from college than other Poles. In response to a question from the Diagnoza Survey about parents' aspirations for the education of their children, respondents with Kresy ancestors scored higher than those whose ancestors were not from the Kresy region.

Descendants of Kresy migrants today have roughly 10 percent higher incomes, are more likely to have white collar occupations, and are less likely to be unemployed than other Poles. Respondents with Kresy ancestors are significantly less likely to believe that material goods determine a successful life, and they own fewer assets than other Poles, even when they have the means to purchase them.

— Alex Verkhivker

Hotter School Days, Less Learning — Unless There's AC

Cumulative heat exposure over the course of a school year is associated with a lower level of student learning, and the presence of classroom air conditioning systems nearly wipes out that negative effect, Joshua Goodman, Michael Hurwitz, Jisung Park, and Jonathan Smith show in **Heat and Learning** (NBER Working Paper No. 24639).

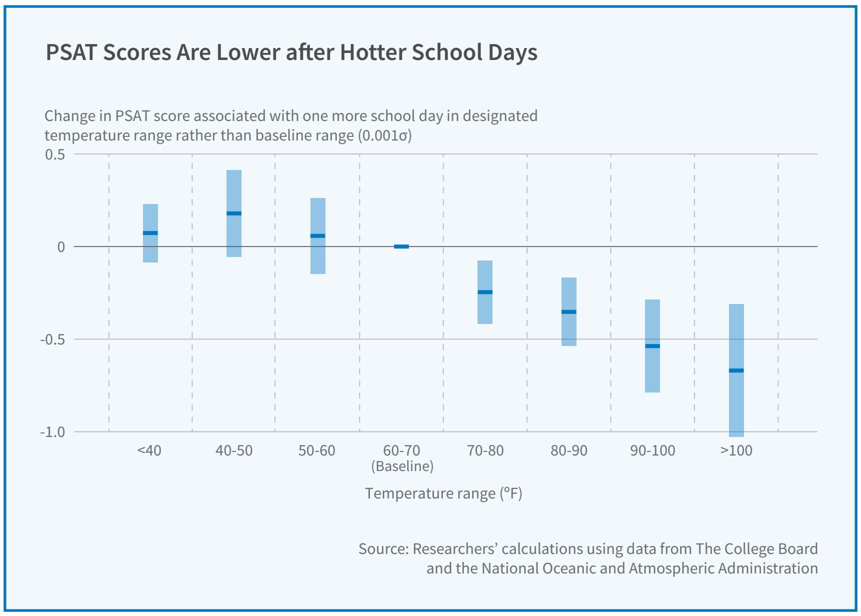
Many previous studies have tried to assess the effects of temperature on learning. Students in hotter countries tend to score lower on comparable measures of academic achievement than those in more temperate climates, but there are many differences across countries, other than average temperature, that are difficult to hold constant.

In this study, the researchers reviewed the PSAT test scores of 10 million U.S. students from the high school classes of 2001 through 2014, all of whom took the PSAT at least twice. They also collected or generated data on daily temperatures near schools, the penetration rate of air conditioning at schools, and many other demographic, educational, and environmental factors. Comparing a student's score on the test to the same student's score one year later allowed them to isolate the impact of experiencing a hot school year prior to the test.

> In school districts without air conditioning, a 1°F increase in average school year temperature is associated with a one percent decline in learning.

The key finding is that higher temperatures over the course of a school year reduce academic achievement. Each additional school day with a temperature in the 90s, rather than the 60s, reduced achievement by one-sixth of a percent of a typical year's gain. If the temperature exceeded 100°F, the adverse effect was even larger. Weekend and summer heat had little impact; the effects were associated only with higher school-day temperatures. The study controls for the correlation of heat, air pollution, and other local economic shocks.

Without air conditioning, each 1°F increase in average school year temperature is associated with a one percent decline in the amount learned during the school year. For schools with air conditioning, however, the negative effects virtually disappear.



The researchers note that lower-income and minority students are more likely to attend schools that are not air conditioned. They estimate that, for most regions of the United States, investing in school air conditioning systems leads to sufficiently high income gains for students in the long-term to outweigh the costs of that initial infrastructure investment.

—Jay Fitzgerald

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