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## Capital Market Integration and Branch Banking

Bank branch networks help integrate U.S. lending markets in segments where arm's-length financing is costly or even infeasible, according to **Exporting Liquidity: Branch Banking and Financial Integration** (NBER Working Paper No. 19403) by **Erik Gilje, Elena Loutskina, and Philip Strahan**. By studying deposit windfalls from the purchase of drilling rights following the discovery of oil and gas shale resources in some areas, the authors demonstrate that banks benefiting from the windfalls extend their origination of new loans into outlying, non-boom areas. This increase in loans only happens in counties where banks have branches, and it is most evident in the market for mortgages that are hard to securitize. The estimates suggest that retained mortgages increase

somewhat more than 2 percent for every 1 percent increase in deposits. The authors do not find any effect of deposits on

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mortgages that are sold off to national capital markets.

The authors explain that “[t]hese results suggest that banks export deposits to non-booming markets and increase credit supply rather than merely retain more loans... [B]ranch networks allow lenders to mitigate contracting frictions, and play an important role in financial integration.”

National capital markets have transformed the banking system over the past three decades. In 1980, only 12 percent of all home loans were securitized. By 2011, that share was

up to 52 percent. This rise could have made branch banking less important for integrating lending markets. Yet the number of

branches per bank also increased, from five per bank in 1990 to 14 per bank in 2011. These similar trends suggest that securitization and branch networks act as complementary, rather than substitute, ways to integrate local lending markets.

The authors use the unexpected, large wealth windfalls stemming from shale booms to test this thesis. They study the 327 banks that received deposits in the seven states with major shale discoveries during the 2003–10 period: Arkansas, Louisiana, North Dakota, Oklahoma, Pennsylvania, Texas,

and West Virginia. Average mortgage lending grew 11.7 percent per year for the banks that benefited from shale discoveries over this period, compared with 11.2 percent for banks that did not participate in the shale booms.

By discarding the lending activity in the 124 counties that experienced booms and focusing instead on the mortgage loans that the 327 banks made in the 515 counties that did not participate in shale

booms, the study avoids potential distortions to credit demand that arise directly from the shale booms. The authors find that the banks exposed to these booms increased lending in non-boom counties more than non-exposed banks, but only when the exposed banks had branches located near borrowers. As a result, shale-boom banks saw retained mortgage growth average 9.1 percent per year, substantially greater than the 7.7 percent per year for non-boom

banks. New lending expanded the most in home equity lines of credit, the category of mortgages that is hardest to securitize, and the least in mortgage re-financings, the easiest to securitize.

The authors conclude that by allowing capital to flow more easily across local markets, deregulation of bank branching fostered a denser branch network that improved capital mobility and thus investment allocation efficiency.

— Laurent Belsie

## Measuring the Long-Term Impacts of Teachers

Concern over the quality of U.S. schools has focused attention on the role that teachers play in school outcomes. Efforts to measure teachers' contributions to student progress generally focus on teacher "value-added," a measure of how much having a class with a particular teacher adds to an individual student's test scores. Debates about the usefulness of value-added measures have centered on whether test scores are adequate measures of the kind of learning that is useful later in life, and the extent to which test scores are affected by parental and school efforts to match particular students with particular teachers.

In **Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood** (NBER Working

Paper No. 19424), **Raj Chetty, John N. Friedman, and Jonah E. Rockoff** conclude that good

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"[A] teacher with higher value-added raises the probability of college attendance, reduces the probability of teen pregnancy, and increases earnings at age 28."

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teachers improve student outcomes up to a decade after they graduate from a large urban school district. The authors match more than one million student records with post-graduation earnings and college attendance information, and then explore the effect of being in a particular teacher's class on earnings and college matriculation.

They find that spending a single year in grades 4 through 8 in a classroom taught by a teacher with higher value-added raises the probability of college

attendance, reduces the probability of teen pregnancy, and increases earnings at age 28. A

year in the classroom with a teacher who has a value-added that is one standard deviation above the mean is associated with an increase in the probability of college attendance of 0.8 percent, from a mean of 37 percent. The probability of teen pregnancy falls by 0.61 percent from a mean of 13.4 percent; the probability of working at age 28 rises by about 0.4 percent, and annual earnings at age 28 rise by \$350, or about 1.7 percent. These effects occur even though the estimates sug-

gest that an individual teacher's influence on test scores falls to 25 percent of its initial impact after several years.

The authors conclude that value-added measurements may be helpful in finding the combination of metrics that best iden-

tify the teachers who are most successful at improving long-term student outcomes.

— Linda Gorman

## Point of Collection and the Pass-Through of Excise Taxes

One issue in the debate over carbon-emission taxes is whether such taxes should be levied on energy producers or on energy users. The likelihood of tax evasion is a key consideration in this choice. In **Do the Laws of Tax Incidence Hold? Point of Collection and the Pass-through of State Diesel Taxes** (NBER Working Paper No. 19410), **Wojciech Kopczuk, Justin Marion, Erich Muehlegger, and Joel Slemrod** study differences across states in the point of collection for diesel fuel taxes. They conclude that moving the point of tax collection from the retail gas station to the distributor or prime supplier substantially raises the pass-through of diesel taxes to the retail price. Such a move also raises revenues, suggesting that evasion is the likely explanation for this result.

States differ in the stage of

the supply chain responsible for remitting the excise tax on diesel fuel, and in recent decades

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“[D]iesel taxes are passed through to retail prices to a greater extent in states where the point of collection is at the distributor ... rather than at the retail level.”

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many states have moved away from collecting this tax from retail stations and toward collecting it from prime suppliers. In part this was because it was relatively costly to monitor the remittance of the tax when many remitters were each responsible for a small fraction of total revenue. Also, variation in tax rates across jurisdictions and across the uses of diesel fuel created opportunities for misstating the applicable tax rate or the intended use of each gallon of diesel fuel.

For each state and year, the authors collected data on the point of collection for diesel

and gasoline taxes from the publications of the Federal Highway Administration and other

sources. They use these data to estimate the response of retail prices and total tax collections to the point of collection. Retail diesel prices are higher and diesel taxes are passed through to retail prices to a greater extent in states where the point of collection is at the distributor or prime supplier level rather than at the retail level. States also receive less tax revenue, conditional on their tax rates, when taxes are collected at the retail level. The authors find that an increase in the excise tax raises the wholesale price in supplier-remitting states, although not in retailer-remitting states.

— Matt Nesvisky

## Does Uncertainty Reduce Growth?

A growing body of evidence suggests that uncertainty rises sharply in recessions and

falls in booms. This was evident during the Great Recession. But does uncertainty cause

recessions, or is higher uncertainty simply a natural outcome of economic downturns?

Unfortunately, identifying the causal direction of the relationship between uncertainty and growth is difficult because many economic variables move together over the business cycle.

In **Does Uncertainty Reduce Growth? Using Disasters as Natural Experiments** (NBER Working Paper No. 19475), **Scott Baker** and **Nicholas Bloom** explore the relationship between uncertainty and growth in 60 countries including the United States since 1970. They focus on uncertainty created by arguably exogenous shocks that occur in the form of natural disasters, terrorist attacks, political coups, and revolutions.

The authors find that differ-

ences in uncertainty across countries appear to explain about

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“[D]ifferences in uncertainty across countries appear to explain about half of the variation in GDP growth following major shocks.”

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half of the variation in GDP growth following major shocks. This finding provides important support for the hypothesis that rising uncertainty can have a large negative effect on economic growth. The findings are robust to the use of alternative measures of volatility such as exchange rate volatility or bond price volatility, rather than stock market volatility.

The authors observe that some shocks, such as natural disasters, are bad news for the

level of economic activity but they do not raise the level of

uncertainty about future events. Other shocks — like political coups — also induce a lot of uncertainty and raise the level of volatility in the economy. The authors use data on stock market returns and volatility to distinguish the mean effects (bad news) and volatility effects (higher uncertainty) of these shocks. During the year following these shocks, the bad news and uncertainty components have roughly equal effects on GDP growth.

— Claire Brunel

## The Impact of Greater Transparency in Financial Markets

Corporate bonds are traded in one of the world’s largest over-the-counter markets. In July 2002, this market underwent a significant change when the Financial Industry Regulatory Authority (FINRA), then the National Association of Securities Dealers (NASD) required timely public disclosure of information on the prices and volume of completed transactions. This reform was implemented through the Trade Reporting and Compliance Engine (TRACE) program. Bond trade dissemination was

phased in on four separate dates, denoted Phase 1, 2, 3A, and 3B, over a three-and-a-half year

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“[M]andated post-trade transparency was associated with an overall reduction in trading activity.”

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period. The increase in the amount of information available to market participants as a result of these reforms was so significant that it has been compared to the introduction of stock market tickers in the early twentieth century and to the adoption later on of electronic screens for Treasuries.

In **The Effects of Mandatory Transparency in Financial Market Design:**

**Evidence from the Corporate Bond Market** (NBER Working Paper No. 19417), authors **Paul Asquith**, **Thom Covert**, and **Parag Pathak** study the impact of this increase in transparency. They find that mandated post-trade transparency was associated with an overall reduction in trading activity. While

they do not find any statistically significant negative effects in Phases 1, 2, and 3A, in Phase 3B they find that trading activity in the affected bonds fell by 41.3 percent in the 90 days following the dissemination of price and volume information. The drop in trading activity coincided with the start of dissemination.

The implementation of TRACE is also associated with lower price dispersion. This decrease is significant and robust across bonds that change dissemination in Phases 2, 3A, and 3B, but is largest, 24.7 percent, for Phase 3B bonds. The authors note that if the transparency introduced in each phase affects not only the specific bonds cov-

ered by that phase but also all bonds that become transparent in subsequent phases, then their estimates of the impact of the later phases may understate TRACE's overall impact.

The authors also find that high-yield bonds experience a significantly greater reduction in trading activity than investment-grade bonds. They infer from this that requiring transparency has a limited impact on the most liquid segment of the market.

The authors point out that increased transparency may change the relative bargaining positions of investors and dealers, allowing investors to obtain fairer prices at the expense of

dealers. In addition, lower price dispersion should allow investors and dealers to base their capital allocation and inventory holding decisions on more stable prices.

Many over-the-counter securities are similar to the bonds that FINRA placed in Phase 3B: they are infrequently traded, subject to dealer inventory availability, and their trading is often motivated by idiosyncratic, firm-specific information. This raises the possibility that expansion of TRACE-inspired regulations to the markets for other securities may affect trading activity and price dispersion in those markets.

— Les Picker

## Can Higher Prices Increase Market Share? Average Wholesale Prices and Medicaid Drug Procurement

The growing generic drug market is generally believed to provide lower-cost alternatives to brand-name drugs and to contribute to lower health-care costs. However, in **Perverse Reverse Price Competition: Average Wholesale Prices and Medicaid Pharmaceutical Spending** (NBER Working Paper No. 19367), authors **Abby Alpert, Mark Duggan,** and **Judith Hellerstein** find that the procurement rules for the Medicaid program create incentives that sometimes drive pharmacies to forego purchasing the lowest-cost version of

a given generic drug and to choose instead a version that

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“[P]rocurement rules for the Medicaid program create incentives that sometimes drive pharmacies to forego purchasing the lowest-cost ... generic drug(s).”

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costs the Medicaid program more and that will also deliver a higher profit. In turn, generic drug manufacturers have an incentive to compete for pharmacy market share by driving up the prices paid to pharmacies by Medicaid. The authors report that a federal government crackdown on Medicaid pricing practices in 2000 led to a 45 per-

cent decrease in the Medicaid market share of the drugs tar-

geted by the crackdown, which were generic drugs with high Medicaid reimbursement levels.

The fraction of drug spending paid for by governments and by private insurance companies has grown from 34 percent in 1980 to 92 percent in 2010. Consumers now account for only 8 percent of such payments. The sale of generic drugs

also has risen steadily over the years, accounting for 75 percent of total prescriptions dispensed in the United States in 2009 compared to 50 percent in 1999.

The authors study the period 1994 to 2004, when Medicaid accounted for nearly 20 percent of all prescription drug expenditures in the United States. Medicaid's dominant method of reimbursing pharmacies for prescriptions dispensed to Medicaid recipients then, as now, was based on a benchmark price called the average wholesale price (AWP). The AWP approach allows pharmacies to profit from Medicaid reimbursement when there is a "spread" or a difference between reimbursements and a pharmacy's actual acquisition costs. While the designers of the AWP approach anticipated that pharmacies would seek to maximize this spread by searching for the versions of generic drugs with

the lowest acquisition costs, in practice pharmacies sometimes opt instead to buy generic drugs with the highest AWP.

The benchmark AWP, upon which reimbursement to pharmacies is based, has been traditionally reported by generic drug producers themselves and until recently had been subject to essentially no independent verification. In the 1990s, the U.S. Department of Justice (DOJ) launched a series of investigations into Medicaid drug procurement practices, culminating in a 2000 pronouncement that many reimbursement prices had been artificially inflated and that the AWP used to reimburse pharmacies should be reduced by as much as 95 percent for about 400 generic and other off-patent drug products.

Alpert, Duggan, and Hellerstein examine the changes in pharmacy behavior associated with the DOJ's interven-

tion in the Medicaid generic drug market. They hypothesize that manufacturers of generic drugs were competing for pharmacy market share by bidding up reported prices that entered the AWP-based reimbursement calculation, thereby increasing the spreads earned by pharmacies. The authors find that the DOJ-targeted drugs cost the Medicaid program on average about three times more than bioequivalent drugs in 1999. These drugs had an average Medicaid market share that was more than five times as large as those from competitors before the DOJ intervention, and their Medicaid market share fell by about 45 percent between the intervention and 2004. The higher the spread and the market share for a particular drug before the DOJ intervention, the more its price and Medicaid market share were likely to decline afterward.

— Jay Fitzgerald

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