



## **BANKING REGULATION: AN OVERALL PERSPECTIVE**

In this paper, Xavier Freixas and Anthony M. Santomero explore the important changes taking place in banking regulation as a result of ongoing financial innovation and the evolution of a more sophisticated system of regulation. They apply asymmetric information theory — a paradigm in which economic agents are presumed to operate in a world of incomplete, and sometimes biased, information — to issues central to the theory of banking.

The authors review the impact of such imperfect information on our understanding of why financial markets exist, how they operate, and how best to regulate them. They examine the market failures specific to the banking industry, taking an overall perspective to show how apparently disconnected regulatory measures, such as capital requirements, law and finance, or the Glass-Steagall Act are interwoven.

*Working Paper 02-1, "An Overall Perspective on Banking Regulation," Xavier Freixas, Universitat Pompeu Fabra, and Anthony M. Santomero, Federal Reserve Bank of Philadelphia*

## **DO BANKERS SACRIFICE VALUE TO BUILD FINANCIAL EMPIRES?**

In the last two decades of the 20<sup>th</sup> century, consolidation activity swept the financial industry both in the United States and across the globe, creating a number of complex financial institutions and reducing the number of banking firms. In recent studies of the effect of such consolidation on the market value of banks, researchers have found that while some acquirers increase market value through consolidation, many destroy it.

In this paper, the authors raise the question: Do bankers sacrifice value to build larger institutions from which they could

more easily take greater financial compensation and consume more agency goods? The authors seek evidence on this by examining data on publicly traded bank holding companies operating in the U.S. from 1992 through 1994. They characterize managerial entrenchment — the ability of managers to resist market discipline — and look for evidence of entrenchment in the association of ownership structure and investment opportunities with financial performance. They specifically look for evidence that a larger amount of recently acquired assets and a larger total amount of assets are associated with worsened financial performance, an association they term "empire building."

The authors' findings suggest that managerial entrenchment is present at banks with higher levels of managerial ownership, better growth opportunities, poorer financial performance, and smaller asset size. While an increase in asset size not obtained by acquisition is associated with improved performance for most banks, an increase in the amount of acquired assets is associated with improved performance at banks not exhibiting managerial entrenchment and with worsened performance at banks exhibiting entrenchment.

The authors conclude that while scale and scope economies have likely been driving forces of the consolidation in the banking industry, not all mergers and acquisitions that lead to larger banks are value enhancing. When bank management is entrenched, some of this acquisition activity has likely been associated with empire building.

*Working Paper 02-2, "Do Bankers Sacrifice Value to Build Empires? Managerial Incentives, Industry Consolidation, and Financial Performance," Joseph P. Hughes, Rutgers University; William L. Lang, Office of the Comptroller of the Currency; Loretta J. Mester, Federal Reserve*

*Bank of Philadelphia and the Wharton School, University of Pennsylvania; Choon-Geol Moon, Hanyang University; and Michael S. Pagano, Villanova University*

## **IS MACROECONOMIC RESEARCH ROBUST TO ALTERNATIVE DATA SETS?**

Macroeconomists use historical data for a variety of purposes: to test models, to analyze economic events and policy, and to forecast. In many cases, however, the data that should be used in these studies are not the (final, revised) data available from government statistical agencies today, but rather the original, unrevised data available to economic agents at the time. In other cases, the ability to verify published findings and check the robustness of those findings to different data sets is an important test of the validity of the results.

These reasons motivated the authors to develop a real-time data set consisting of a series of vintages of data, each corresponding to an economist's information set on the date of the vintage. (The data set is available on the Internet at [www.phil.frb.org/econ/forecast/reaindex.html](http://www.phil.frb.org/econ/forecast/reaindex.html).) This paper focuses on two main aspects of the data set: 1) examining the nature of data revisions, and 2) testing the robustness of some important macroeconomic studies to alternative choices of data vintages. The authors use spectral analysis to analyze data revisions, and they investigate the information content of data revisions by testing for "news" and "noise."

For the macroeconomic studies they examined, the authors found that results were generally robust, at least qualitatively, for different vintages of the data. But in some cases, the empirical results were quite sensitive to the exact vintage of the data. The authors conclude that without checking empirical results against alternative vintages, researchers cannot be sure their results are not a special case that applies only to a particular data set. Therefore, it is important for researchers to investigate older research results using newer data and newer research results using older data, instead of relying only on the most recent data available.

*Working Paper 02-3, "Is Macroeconomic Research Robust to Alternative Data Sets?" Dean Croushore and Tom Stark, Federal Reserve Bank of Philadelphia*

## **COMMERCIAL CHECK CASHING: AN INDUSTRY IN FLUX**

Commercial check-cashing outlets (CCOs) service millions of low- and moderate-income households by cashing checks and providing a variety of related payment services and convenience items. Over

the past 20 years, CCOs have grown rapidly. However, changes in the financial sector pose a threat to the existence of check-cashing outlets, and, according to the author, CCOs may not survive another decade, at least in their traditional form.

This paper examines four developments that may radically alter the check-cashing industry: the growing use of electronic payments; the deployment of automated check-cashing machines; the rise of payday lending; and the development of bank/CCO hybrids.

The author predicts that many traditional CCOs will close as paper paychecks continue to decline relative to electronic payments. Automatic check-cashing machines, as they become more common, also pose a threat to CCOs and perhaps to many employees of surviving CCOs. However, the author speculates that many CCOs will evolve in response to these developments. Some check-cashing outlets will become small-loan businesses, dropping check-cashing services or relegating them to a mere supporting role. Other CCOs will augment their revenue by acting as agents for banks, taking bank deposits, dispensing cash, assisting with loan applications, and meeting the payment needs of banks' local business clients.

*Working Paper 02-4, "Check-Cashing Outlets in a Changing Financial System," John P. Caskey, Swarthmore College; Visiting Scholar, Federal Reserve Bank of Philadelphia*

## **ENDURING RELATIONSHIPS IN AN ECONOMY WITH CAPITAL**

In this paper, the authors examine the qualitative behavior of an economy with long-term contracts with production and capital accumulation. In their model, insurance is implemented by exploiting differences in agents' willingness to intertemporally substitute consumption: individuals with low productivity receive a net transfer of resources at the expense of reduced future expected utility.

Under the assumption of linear technology and constant-relative-risk-aversion preferences, the authors establish a one-to-one mapping between an individual's stock of capital and his or her expected lifetime utility: whenever there is a decrease in the agent's lifetime utility, the contract implements this change through an equivalent decrease in capital. The authors illustrate the contrast between their model and the long-term model with risky endowments. Although both environments exhibit increasing dispersion in wealth across agents, in the endowment economy wealth in the typical contract eventually falls below the autarchy value of the endowment process.

In the production economy with capital accumulation, the adjustment in individuals' stocks of capital affects the value of autarchy. The authors find that the contract is able to maintain welfare above autarchy levels for any agent.

*Working Paper 02-5, "Enduring Relationships in an Economy with Capital," Aubhik Khan, Federal Reserve Bank of Philadelphia; B. Ravikumar, University of Iowa*

### **A QUANTITATIVE THEORY OF UNSECURED CONSUMER CREDIT WITH RISK OF DEFAULT**

In this paper, the authors analyze an economy with unsecured consumer credit that incorporates the main characteristics of United States consumer bankruptcy law and replicates the key empirical characteristics of unsecured consumer borrowing in the United States. Specifically, in the authors' model, borrowers can default on loans by filing for bankruptcy under the rules of Chapter 7 of the U.S. Bankruptcy Code; a household's credit rating deteriorates post-bankruptcy, and it has difficulty obtaining new loans for about 10 years; defaulting households are typically in poor financial shape; there is free entry into the consumer loan industry, and the industry behaves competitively; there is a large amount of unsecured consumer credit; and a large number of people who take out unsecured loans default each year.

The authors demonstrate the existence of a competitive equilibrium for such an economy and characterize the circumstances under which a household defaults on its loans. They show that the model can be specified to account for the quantitative properties of the main facts regarding bankruptcy and unsecured credit. They then use the model to address the implications of two policy experiments, one being a policy change that eliminates the Chapter 7 bankruptcy option for households with median or above-median income. The authors conclude that the welfare gain from this experiment is substantial, being equivalent to a lump-sum transfer payment of about one-quarter of average annual U.S. earnings.

*Working Paper 02-6, "A Quantitative Theory of Unsecured Consumer Credit With Risk of Default," Satyajit Chatterjee, Federal Reserve Bank of Philadelphia; Dean Corbae, University of Texas, Austin; Makoto Nakajima, University of Pennsylvania; Jose-Victor Rios-Rull, University of Pennsylvania, NBER, CEPR, & CAERP*

### **CONSISTENT ECONOMIC INDEXES FOR THE 50 STATES**

In the late 1980s James Stock and Mark Watson developed a coincident index for the United States economy as an alternative to the one published at that

time by the Department of Commerce. Their index is the latent factor estimated in a dynamic single-factor model using the Kalman filter. State versions of the Stock/Watson type index have been developed for the New England states, New York, New Jersey, Pennsylvania, Delaware, and Texas. This paper, authored by Theodore M. Crone, develops a consistent set of Stock/Watson coincident indexes for all 50 states.

Besides their use in monitoring state economies, these indexes are useful in comparing the length, depth, and timing of recessions at the state level. They are also useful in time-series analysis as a composite measure of monthly economic activity at the state level.

The indexes are consistent in the following sense: 1) the input variables for estimating the common factor are the same for each state; 2) the timing of the coincident indexes is set to coincide with the same observable variable in each state (nonfarm employment); and 3) the trend of the index for each state is set to the trend of real gross state product in the state. The final indexes are available on the Internet at [www.phil.frb.org/econ/stateindexes](http://www.phil.frb.org/econ/stateindexes).

*Working Paper 02-7, "Consistent Economic Indexes for the 50 States," Theodore M. Crone, Federal Reserve Bank of Philadelphia*

### **THE IMPACT OF UNEMPLOYMENT ON ALTERNATIVE POVERTY MEASURES**

The extent of poverty in the United States is currently indexed with an approach that was developed in the early 1960s. Government statisticians identify poor individuals by using a set of pre-tax family income thresholds intended to gauge the resources needed to purchase a minimally acceptable consumption level. Thresholds are indexed annually for consumer price inflation, and members of families that fail to receive their threshold income are deemed poor. Poor individuals are then aggregated into an overall index of poverty through a simple headcount, with the number reported both as a level and as a fraction of the total population (the headcount rate).

Researchers, however, have criticized the way individuals are identified as poor and the way the extent of poverty is measured, recommending alternative measures that would yield collections of poor individuals of different sizes and compositions than the official measure. How would such alternative poverty measures affect the relationship between unemployment and poverty? Robert DeFina takes a look at this issue, using data from the March Current Population Survey to estimate state-level cross-section/time-series models of the effects of unemployment on alternative

poverty indexes. The indexes include the official headcount rate and alternatives based on improved identification and aggregation procedures. The estimated effects turn critically on the measurement approaches, both for the total sample population and for selected sub-groups. For some broader indexes DeFina finds that the decline in unemployment of the last decade has had no significant impact on poverty.

*Working Paper 02-8, "The Impact of Unemployment on Alternative Poverty Measures," Robert H. DeFina, Villanova University, and Visiting Scholar, Federal Reserve Bank of Philadelphia*

### **FRAGILE FINANCIAL NETWORKS**

Linkages among agents in financial markets sometimes cause concern because of the risk that a small shock to one agent will spread to other agents in a domino effect. According to this paper by Yaron Leitner, however, a fragile network may be optimal because of and despite the potential for such contagion.

A fragile network presents the threat of contagion. To prevent collapse of the whole network, agents may be willing to "bail out" other agents, that is, to give them cash for free. This allows agents to obtain some of the benefits of risk sharing even though they cannot commit to making payments. In other words, a fragile network is a way to mitigate the friction of lack of commitment. Fragility, however, may have a cost. When the aggregate endowment is not high enough or when it is concentrated among a small group of agents, the whole network may collapse. Leitner characterizes optimal networks and shows that, in some cases, these may be "semi-fragile" (groups of agents such that agents within a group are linked).

*Working Paper 02-9/R, "Fragile Financial Networks," Yaron Leitner, Federal Reserve Bank of Philadelphia*

### **LINKING HOUSE PRICE CAPITALIZATION TO SCHOOL SPENDING**

While residents receive similar benefits from many local public expenditures, only about one-third of all households have children in the public schools. In this paper, Christian A. L. Hilber and Christopher J. Mayer argue that capitalization of school spending into house prices can encourage residents to support spending on schools, even if the residents themselves will never have children in the schools.

To examine this hypothesis, the authors take advantage of differences across communities in the extent of house price capitalization based on the availability of land or population density. They show that fiscal variables and amenities are capitalized to a much greater extent in Massachusetts cities and

towns with little available land and that these localities also spend more on schools. The authors use data from school districts in 49 states to show that per pupil spending is positively related to population density, a proxy for the availability of land. They show that the positive correlation between density and spending persists only in locations with high homeownership rates. Communities with a higher percentage of residents above 65 years of age have increased school expenditures only in places with high population densities, and this correlation grows for the percentage of elderly above 75 or 85 years old, who have a shorter expected duration in their homes. The positive relationship between percentage elderly and school spending is confined to central cities and suburbs of large metropolitan areas and does not exist in places where land for new construction may be easier to obtain. These results support models in which house price capitalization encourages more efficient provision of public services and provide an explanation for why some elderly residents might support local spending on schools.

*Working Paper 02-10, "Why Do Households Without Children Support Local Public Schools? Linking House Price Capitalization to School Spending," Christian A. L. Hilber, Fannie Mae; and Christopher J. Mayer, The Wharton School, University of Pennsylvania, and Visiting Scholar, Federal Reserve Bank of Philadelphia*

### **ARE BUSINESS CYCLES ALIKE ACROSS EXCHANGE-RATE REGIMES?**

Since the adoption of flexible exchange rates in the early 1970s, real exchange rates have been much more volatile than they were under the Bretton Woods system of fixed exchange rates. However, researchers have shown that the volatilities of most other macroeconomic variables have not been affected by the change in exchange-rate regime. This apparently contradicts a view held by many economists — that price rigidities matter and that they should be one of the basic ingredients in any theory of international economic fluctuations.

In this paper, the authors attempt to quantitatively account for this puzzle by introducing price rigidity and local currency pricing in an otherwise standard dynamic general equilibrium model. They develop a two-country, two-sector model with nominal rigidities featuring deviations from the law of one price because a fraction of the firms set prices in buyers' currencies. Their model is able to account for the empirical fact that more variability in real exchange rates does not get transmitted to other macroeconomic variables. By partially insulating goods markets across

countries, local currency pricing considerably dampens the responses of net exports to shocks hitting the economies, therefore helping to account for this puzzle.

*Working Paper 02-11, "Why Are Business Cycles Alike Across Exchange-Rate Regimes?" Luca Dedola, Banca D'Italia, and Sylvain Leduc, Federal Reserve Bank of Philadelphia*

### **COMPENSATING DIFFERENTIALS AND THE SOCIAL BENEFITS OF THE NFL**

Cities, states, and metropolitan areas have on occasion spent large sums of money in an attempt to lure or retain professional sports franchises. They nearly always agree to subsidize the construction or renovation of a publicly financed stadium, along with a leasing arrangement that provides substantial amounts of the revenue generated by the stadium to the team itself. In addition, contracts between these publicly funded facilities and team owners often yield further benefits to the owners in the form of generous shares of revenue from parking and concessions. But what do cities hope to gain from such investment?

Gerald Carlino and N. Edward Coulson argue that city residents obtain benefits from following local teams even if they never attend a single game (i.e., there is a nonexcludable public good aspect associated with professional sports teams). According to this paper, such benefits are measurable via compensating differentials. If people like having a professional sports franchise in their community, they are presumably willing to pay for it, if not directly through the purchase of season tickets, then indirectly through an increased willingness to pay for housing in the area, and through an increased willingness to accept marginally lower wages. The authors use hedonic rent and wage equations to measure the compensating differentials in central cities with franchises of the National Football League. They use repeated observations of cities over time and thereby obtain identification of the NFL effect through franchise expansion and movement.

The authors find that rents are roughly 8 percent higher and wages are 4 percent lower in cities with franchises. They determine that once quality-of-life benefits are taken under consideration, the seemingly large public expenditure on new stadiums appears to be a good investment for cities and their residents.

*Working Paper No. 02-12, "Compensating Differentials and the Social Benefits of the NFL," Gerald Carlino, Federal Reserve Bank of Philadelphia, and N. Edward Coulson, Pennsylvania State University*

### **SELF-FULFILLING EXPECTATIONS AND THE INFLATION OF THE 1970S**

In the early 1960s, inflation in the United States was below 2 percent, but by the late 1970s it was in double digits. Why the inflation rate increased so much over such a relatively short period is still highly debated. One recent theory of inflation suggests that increases in inflation expectations become self-fulfilling as a consequence of the nature of monetary policymaking. According to this theory, once the public believes that inflation will rise, monetary policymakers may end up validating such expectations by increasing the money supply in the economy. Does this theory account for the high inflation of the 1970s?

In this paper, Sylvain Leduc, Keith Sill, and Tom Stark examine whether the post war data are consistent with theories of a self-fulfilling episode during the 1970s that was reined in by more aggressive monetary policy in the 1980s and 1990s. The authors use data on inflation expectations from the Philadelphia Fed's Livingston Survey, which has recorded forecasters' expectations of CPI inflation and other macroeconomic variables since 1946. They conclude that, indeed, monetary policy in the 1970s accommodated sudden movements in expected inflation, resulting in highly persistent actual inflation. The authors show that post-1979, monetary policy was more aggressive in fighting inflation, so that movements in expected inflation were not self-fulfilling.

*Working Paper 02-13, "Self-Fulfilling Expectations and the Inflation of the 1970s: Evidence from the Livingston Survey," Sylvain Leduc, Keith Sill, and Tom Stark, Federal Reserve Bank of Philadelphia*

### **THE CYCLICAL BEHAVIOR OF STATE EMPLOYMENT DURING THE POSTWAR PERIOD**

In this paper, Gerald Carlino, Robert DeFina, and Keith Sill document a substantial decline in the volatility of employment measured at business-cycle frequencies over the post war period and examine some possible sources of the decline. Using a unique data set on quarterly employment levels by state and industry, the authors find that the decline stems largely from a drop in the volatility of employment shocks and that the decline is widespread across industries and states.

Their analysis indicates that fluctuations in the average size of employment shocks have been a major influence, although the reasons for the smaller shocks are not well understood. The authors find that industry and demographic structure affected volatil-

ity, though the effect was small.

Given the substantial impact of the decline in the size of employment shocks, the authors suggest further research to determine its possible causes.

*Working Paper No. 02-14, "The Cyclical Behavior of State Employment During the Postwar Period," Gerald Carlino, Federal Reserve Bank of Philadelphia; Robert DeFina, Villanova University; and Keith Sill, Federal Reserve Bank of Philadelphia*

## MODELS FOR FORECASTING COIN DEMAND

Because of increases in coin demand in 1999 and 2000, people had trouble obtaining all the coins of various denominations they wanted. As a result, the Federal Reserve Bank of Philadelphia began in 2000 to investigate how to improve forecasts of demand for coin. The idea was that if the Fed had its own projection of the demand for coins, it could work with the U.S. Mint to ensure an adequate supply.

This paper, by Dean Croushore and Tom Stark, describes the development of coin forecasting models. The authors developed four different models: (1) a structural model in which the demand for each coin denomination depends on macroeconomic variables; (2) a time-series model in which the demand for each coin denomination depends only on the history of the demand for that denomination; (3) a vector autoregression (VAR) model that relates the time series of coin demand to macroeconomic variables; and (4) a Bayesian VAR model that modifies the VAR model using Bayesian statistical methods.

The authors run the forecasts from these four models through a variety of statistical tests and choose to eliminate the structural model from use because it performs so poorly. Forecasts from the other three models pass most of the statistical tests. As a result, those models are used in real time to forecast coin demand. Several years of experience suggest that the time-series model is superior to the VAR model, with inconclusive evidence on whether the Bayesian VAR model is better or worse than the time-series model.

*Working Paper No. 02-15, "Forecasting Coin Demand," Dean Croushore and Tom Stark, Federal Reserve Bank of Philadelphia*

## THE VALUE OF SPEAKING A SECOND LANGUAGE

Does it pay for Americans to learn a second language? Mastery of a language other than English is said to be desirable in today's labor market, but little systematic research has addressed this issue. In this paper, Albert Saiz and Elena Zoido estimate the returns to speaking a second language for col-

lege graduates who are native English speakers in the United States. The authors use a variety of empirical strategies to explore this issue, ultimately determining that college graduates who speak a second language earn, on average, wages that are 2 percent higher than those who do not speak a second language. The authors include a complete set of controls for general ability using information on grades and college admission tests and reduce the concern that selection drives the results, controlling for the academic major chosen by the students.

The estimation of the returns to speaking foreign languages may have important policy implications for individual states as they define high school curricula. The authors believe that further research should assess the reasons for the positive returns to speaking a foreign language.

*Working Paper No. 02-16, "The Returns to Speaking a Second Language," Albert Saiz, Federal Reserve Bank of Philadelphia, and Elena Zoido, Harvard University*

## THE POLITICAL ECONOMY OF POTHoles

Are dictatorships more prone to build and maintain roads? This paper, by Albert Saiz, identifies a puzzling fact: Countries that are more democratic tend to have roads in worse conditions than less democratic countries. The author uses data on quality of roads for a sample of developing countries and controls for several variables that differ between democracies and dictatorial regimes. The result is robust to instrumenting the values for a democracy index in 1980 with lagged values of the same democracy variable, and to instrumenting with other variables such as climate and percentage of population who are illiterate.

The author advances four theories to explain these results. First, dictatorial governments may be more prone to spend on "white elephant" road projects. Thus, road quality may be higher than optimal in dictatorial regimes. Second, democracies care more about redistribution, so they give higher priority to welfare-related consumption expenditures. Third, dictatorships may have preferences toward maintaining a good road network ready for internal and external military intervention. And finally, electoral competition may generate a higher discount rate among elected officials, which may push them to give priority to new construction over maintenance.

*Working Paper No. 02-17, "Democracy to the Road: The Political Economy of Potholes," Albert Saiz, Federal Reserve Bank of Philadelphia*

## TECHNOLOGY FLOWS MATRIX ESTIMATION REVISITED

During the 1980s, author F. M. Scherer estimated a matrix of technology flows from U.S. industries that performed research and development (R&D) to industries expected to use the R&D outcomes by analyzing over 15,000 patents obtained by firms participating in the Federal Trade Commission's Line of Business Survey. In this paper, the author revisits his work of two decades earlier to see whether the desired matrix of technology flows could have been obtained using publicly available information, or information that could be gleaned as a byproduct of existing surveys, without the costly effort of poring over a large sample of individual invention patents.

The author uses widely available input-output data in his attempt to emulate the original technology flows matrix and concludes that it is feasible to construct meaningful technology flows matrices using approaches that are less labor-intensive than those used for his original effort two decades ago. However, he points out that substantial progress requires improvements in the data obtained from industry in annual R&D surveys or patent filings.

*Working Paper No. 02-18, "Technology Flows Matrix Estimation Revisited," F.M. Scherer, Visiting Scholar, Federal Reserve Bank of Philadelphia*

## CONSUMER CREDIT REPORTING IN AMERICA

In the United States today, there is at least one credit bureau file, and probably three, for every credit-using individual in the country. Over 2 billion items of information are added to these files every month, and over 2 million credit reports are issued every day. Real-time access to credit bureau information has reduced the time required to approve a loan from a few weeks to just a few minutes. But credit bureaus have also been criticized for furnishing erroneous information and compromising privacy. The result has been 30 years of regulation at the state and federal levels.

This paper, by Robert M. Hunt, describes how the consumer credit reporting industry evolved from a few joint ventures of local retailers around 1900 to a high technology industry that plays a supporting role in America's trillion dollar consumer credit market. Credit bureaus have changed as retail and lending markets changed, and the impressive gains in produc-

tivity at credit bureaus are the result of their substantial investments in technology.

Credit bureaus obviously benefit when their data are more reliable, but should they be expected to attain the socially efficient degree of accuracy? There are plausible reasons to think not, says the author, and this is the principal economic rationale for regulating the industry. An examination of the requirements of the Fair Credit Reporting Act reveals an attempt to attain an appropriate economic balancing of the benefits of a voluntary information-sharing arrangement against the cost of any resulting mistakes.

*Working Paper No. 02-21, "The Development and Regulation of Consumer Credit Reporting in America," Robert M. Hunt, Federal Reserve Bank of Philadelphia*

## COLLATERAL AND COMPETITION

In this paper, Mitchell Berlin and Alexander W. Butler examine the effects of changes in competitive conditions on the structure of bank loan contracts. The authors investigate a claim often made by bankers that competitive pressures in loan markets compel them to soften contract terms, in particular, to lower collateral requirements or relax covenant restrictions.

They present a model in which an increase in competition can lead to less stringent collateral requirements. In the model, initial contracts are designed to be very stringent, in the expectation that they can be renegotiated in light of evolving information. But renegotiation requires the lender to produce information about the borrower, and the lender's monitoring effect is chosen to maximize its own profits. More competition reduces the lender's bargaining rents, thereby reducing the bank's private return to monitoring. When lenders monitor less, their information is less accurate, and fine-tuning the initial contract through renegotiation becomes more difficult. In turn, the initial contracts are optimally less stringent.

The authors also analyze the interaction between the degree of competition and the efficiency of contractual renegotiation. Insufficiently competitive markets may lead to bargaining difficulties that reduce the efficiency of renegotiable contracts. When competition is weak, negotiable contracts remain feasible only if collateral levels are inefficiently low.

*Working Paper No. 02-22, "Collateral and Competition," Mitchell Berlin, Federal Reserve Bank of Philadelphia, and Alexander W. Butler, Rice University*

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