

research review



Issue No. 2, September 2004 - December 2004

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Research Review provides an overview of recent research by economists of the Federal Reserve Bank of Boston. Included are summaries of scholarly papers, staff briefings, and Bank-sponsored conferences, as well as a reference list of work by Bank economists recently published externally.

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Public Policy Discussion Papers

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Massachusetts Business Taxes: Unfair? Inadequate? Uncompetitive?

by Robert Tannenwald

complete text: <http://www.bos.frb.org/economic/ppdp/2004/ppdp0404.pdf>
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Motivation for the Research

Massachusetts policymakers have vigorously debated the optimal level of state and local business taxes since the founding of the Commonwealth. Lately, they have focused on three concerns about these taxes: Are they “fair”? Are they “adequate”? Are they “competitive”?

For those who have struggled to give policymakers lucid, impartial insights into these issues, recent developments have been discouraging. Sparring interest groups have spawned a thicket of statistics whose derivation is not always clearly explained and whose significance and relevance are sometimes difficult to fathom.

This paper aims to clarify recent debate about the fairness, adequacy, and competitiveness of state and local business taxation in Massachusetts.

Research Approach

The author defines a business tax and explains the concepts of fairness, adequacy, and competitiveness in the context of business taxation. He then presents and assesses the validity of indicators recently used in Massachusetts to evaluate the Commonwealth’s business taxes in general, and its corporate excise tax in particular, in the context of these three normative goals. Finally, he presents two new indicators of tax competitiveness and applies them to business taxation in the 50 states, in order to assess the competitiveness of Massachusetts business taxes.

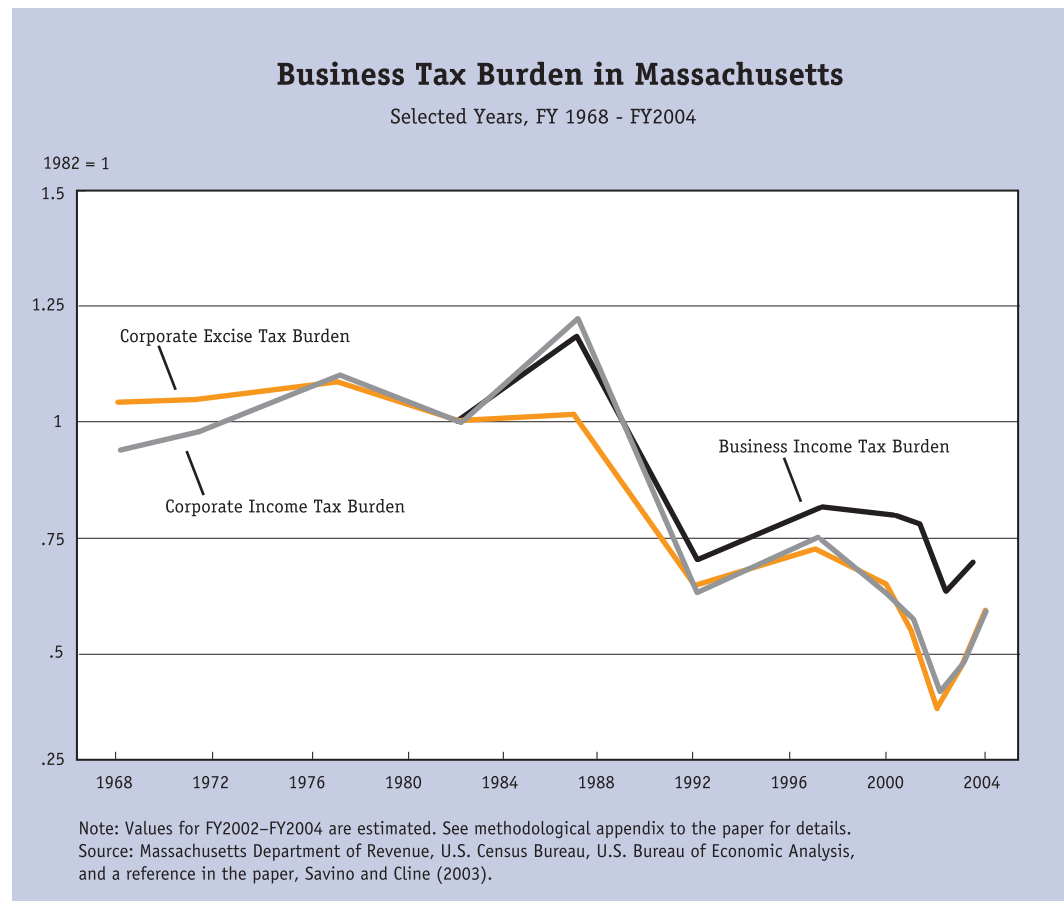
Key Findings

- Evidence shows that the adequacy of the Massachusetts corporate excise tax has diminished in recent years. In the aggregate, the bases of the Commonwealth’s corporate income taxes have been eroding, especially during the last decade.
- Evidence concerning the fairness of the Massachusetts corporate excise tax, as well as the fairness of the Commonwealth’s business taxes in general, is inconclusive, although modifications to the corporate excise tax introduced in recent years clearly favor some types of firms over others.
- Taken as a whole, Massachusetts business taxes do not diminish the Commonwealth’s competitive standing. The author finds abundant evidence that Massachusetts business taxes are competitive, even from data supplied by business interest groups.
- One can best gain insight into a state’s business tax competitiveness through the “representative firm” approach. In this approach, the tax analyst attempts to view a state’s business taxes and those of its competitors through the eyes of a rational, well-informed, profit-maximizing firm that is in the process of choosing a site for a new facility.

Implications

The author recommends a healthy skepticism concerning the statistical validity and unbiasedness of all these types of indicators, including the two new measures he introduces in this paper—which are, however, an improvement over existing measures.

Policymakers and policy analysts could better evaluate the fairness of the Commonwealth's business taxes if they had more data on how the ratio of taxes to pretax profits differs on average across industries and business size. In possession of such data, they could evaluate disparities in the ratio and changes over time. If such disparities have widened dramatically, and if there is no reason to believe that the incidence of the benefits of state and local public services has changed in a similar fashion, then policymakers would have reason to be concerned about the fairness of state and local business taxes.



p-04-5

Educational Opportunity and Income Inequality

by Igal Hental, Joel Shapiro, and Paul Willen

complete text: <http://www.bos.frb.org/economic/ppdp/2004/ppdp0405.pdf>

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Motivation for the Research

Affordable higher education is, and has been, a key element of social policy in the United States, with broad bipartisan support. Governments at both the national and the state level in the United States spend large sums of money to make education affordable for the average American, and the public provision of financial aid has substantially increased the number of people who complete university.

Facilitating broad access to higher education through public funding of financial aid to students is generally thought to be a good thing, but there has been less agreement on the justification for this. Many argue that education has positive social externalities, but others make the case that broader access to education promotes equality.

This paper questions the premise that broader access to education promotes equality.

Research Approach

The authors add credit constraints to Spence's (1973) model of wage determination in which education does not enhance productivity but serves only as a costly signal of ability. Credit constraints enter the model because some workers—those who do not receive bequests from their parents or whose bequests do not cover the cost of education—must borrow at a high interest rate to pay for their education.

The authors explore the implications of the model on labor markets analytically, giving particular attention to the impact on wage inequality of changing the cost of tuition and interest rates. They then extend the model to a multi-generation world and look at the dynamics of wealth distribution.

Finally, the authors examine the empirical evidence on financial aid and wage inequality and discuss the evidence in the context of the model.

Key Findings

- Making education more affordable can increase income inequality. When households face credit constraints, lack of education could mean one of two things: low ability; or high ability and low financial resources. Thus, the mix of less-educated workers includes some with high ability. As we relax credit constraints, high-ability workers leave the low-education pool, driving down the wage of less-educated workers.

- With credit constraints, a signaling role for education leads to an upward-sloping demand curve for unskilled labor. The authors assume that all workers of low ability forego higher education, implying that any increase in the quantity of less-educated workers reflects an increase in the proportion of high-ability workers in the less-educated pool, increasing the wage offered by firms to workers with low levels of education.

- Because of the upward-sloping demand curve, anything that reduces the supply of unskilled labor—like tuition assistance and low-interest education loans—and shifts the supply to the left, reduces the wage for unskilled labor and raises the skill premium.

- The dynamic model highlights the interaction between the skill premium and educational attainment over time. As more workers become educated, the wage of unskilled workers falls, making it increasingly difficult for uneducated households to accumulate the wealth required to finance an education.

Implications

The model reconciles the postwar U.S. experience of increased availability of higher education with an increased skill premium. Specifically, government programs in the United States led to a major expansion of the skilled workforce in the postwar era. Between 1947 and 1999, the percentage of people 25 years old and over who had completed four or more years of college increased from 5.4 percent to 23.6 percent. According to the standard labor demand/labor supply model with a downward-sloping demand curve for unskilled labor, this expansion of the skilled labor force and consequent contraction of the unskilled labor force should have led to a fall in the skill premium. By contrast, the model in Hendel et al. predicts an increasing wage premium because of the upward-sloping demand curve. The facts support the upward-sloping curve: The college skill

premium in the United States rose in the 1950s, flattened for the first half of the 1960s before rising again in the second half of that decade, fell in the 1970s, and began a very steep ascent around 1979.

This paper suggests two natural directions for future research. First, one could explore how other factors that, in theory, might affect the relationship between wages and education interact with the mechanism described in the paper. Second, formal empirical tests could provide evidence on how changing financial opportunities have affected wage inequality.

p-04-6

Financial Development, Financial Constraints, and the Volatility of Industrial Output

by Borja Larrain

complete text: <http://www.bos.frb.org/economic/ppdp/2004/ppdp0406.pdf>

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Motivation for the Research

There is substantial evidence in the literature that industrial output is less volatile in developed countries than in less-developed countries, but the evidence is focused on macroeconomic aggregates.

This paper uses micro data (industry-level and firm-level data) to study volatility—in particular, the effect of financial development on volatility.

The advantage of using micro data lies in allowing a more detailed exploration of the mechanisms behind financial development. Using micro data also enables us to study the composition of the changes in volatility in terms of idiosyncratic and systematic components. Idiosyncratic volatility is defined as industry volatility uncorrelated with the GDP of the country where the industry is located, whereas systematic volatility refers to volatility that affects the entire country and is therefore correlated with GDP.

Research Approach

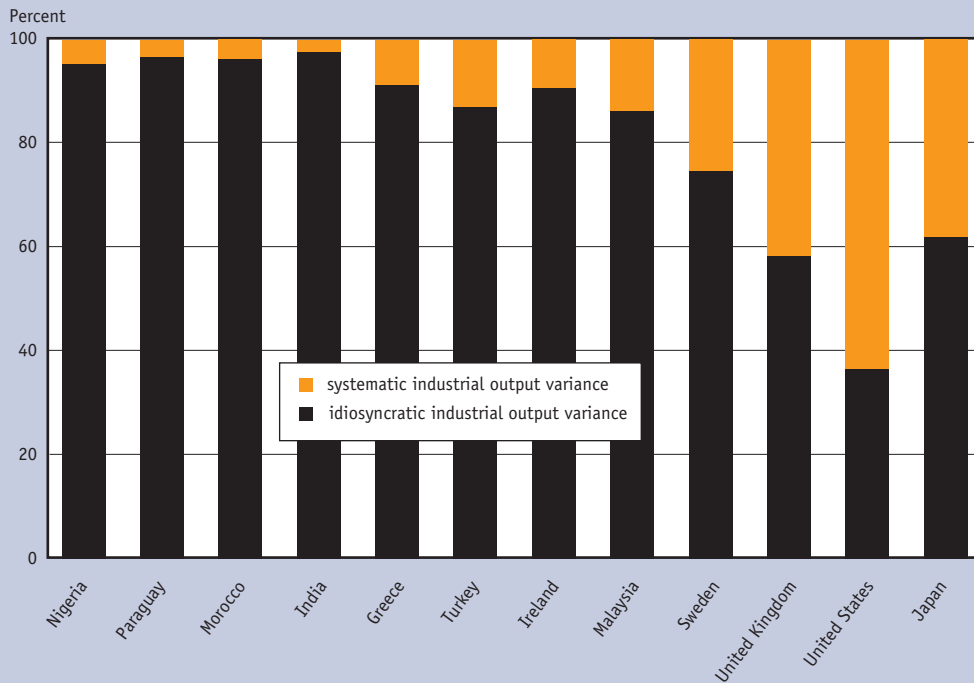
The mechanism studied in this paper is that financial development allows firms to borrow more freely by relaxing financial constraints. These financial constraints arise from agency problems and asymmetric information, which are ameliorated as financial development increases.

The focus of the paper is on short-run output fluctuations, in contrast with the previous literature in this area, which focuses on long-run growth.

The paper develops a simple model, showing that the effect of financial development on output volatility is ambiguous, depending on the circumstances causing constraint. If firms need funds to smooth unfavorable cash-flow shocks, financial development reduces output volatility. On the other hand, if firms need funds to expand production when confronted with a positive investment opportunity, financial development increases output volatility.

The model is tested empirically, employing cross-country as well as within-country comparisons among industries to identify the effects of financial development on industrial volatility. The use of an industry-level ranking of financial constraints can ease some of the difficulties encountered when measuring constraints at the firm level.

Systematic and Idiosyncratic Variance



Countries are shown in ascending order (from left to right) according to their level of private credit as a share of GDP.

Source: UNIDO's Indstat-3 dataset (2001) and author's calculations.

Finally, the paper turns to firm-level data to explore in more detail the mechanism through which volatility is reduced.

Key Findings

- Financial development reduces industrial volatility. This is not surprising, given the macro evidence already available, but now this finding is confirmed by micro evidence—with an extra layer of robustness provided by comparisons of industries that are more financially constrained with those that are less financially constrained. The fact that volatility is reduced suggests that firms face shocks mainly to their cash flows and that as financial development increases, they are able to smooth a larger fraction of these shocks.
- Systematic and idiosyncratic volatility both fall with financial development, but the fall in idiosyncratic volatility is greater. Hence, the reduction in production volatility comes primarily from a reduction in idiosyncratic volatility.
- As a corollary of the preceding point, the correlation of industry output with GDP increases with financial development, and idiosyncratic volatility represents a smaller share of volatility in countries that are more financially developed than in those that are less financially developed.
- At the firm level, short-term debt exhibits stronger negative correlation with firm activity as financial development increases, suggesting that debt serves to smooth output.

Implications

This paper contributes primarily to the literature on financial constraints and to the ongoing debate about the impact of financial development on real activity. The main message is that a well-developed financial system is necessary to ensure a stable productive sector. The results can also be interpreted as showing that banks (the main measure of financial development used in the paper) smooth shocks that affect the productive sector.

A final interesting issue concerns the implications of these findings for the behavior of stock markets. Although a paper by Morck, Yeung, and Yu finds that stocks in less-developed countries tend to have more synchronized movements than stocks in more-developed countries—in other words, that the correlation of a particular stock with the market is higher in a less-developed country—this paper shows that exactly the opposite pattern is true in terms of output correlations with GDP. Reconciling and understanding both results is an important area for future research.

p-04-7

Do Bank Mergers Affect Federal Reserve Check Volume?

by Joanna Stavins

complete text: <http://www.bos.frb.org/economic/ppdp/2004/ppdp0407.pdf>

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Motivation for the Research

The recent decline in the Federal Reserve's check volumes has received a great deal of attention. Although switching to electronic payments methods and electronic check processing has been credited for much of that decline, some it may be attributable to changes following bank mergers involving Federal Reserve customer banks. The literature on the effects of bank mergers is vast, but most of it focuses on the impact of mergers on market competition.

This paper evaluates the effect of bank mergers on Federal Reserve check-processing volumes.

Research Approach

In this paper, the author uses inflow-outflow and regression analysis to examine two types of effects: changes in check volume following mergers of Reserve Bank customer banks with non-customer banks, and changes following mergers between Reserve Bank customer banks.

Data on individual depository institutions in the United States were compiled from multiple sources. Data on individual paper check and ACH volumes were obtained from the Federal Reserve Information System (FRIS). FRIS check-volume data were matched with individual bank records from the quarterly Consolidated Reports on Condition and Income (Call Reports) filed by commercial banks with the Federal Deposit Insurance Corporation (FDIC) or the Comptroller of the Currency. For credit unions, check data were matched with records from the quarterly or semi-annual Statements of Financial Condition filed with the National Credit Union Administration (NCUA). Check data on thrifts were matched with the quarterly Thrift Financial Reports filed with the Office of Thrift Supervision (OTS).

Key Findings

- Mergers of Reserve Bank customer banks with non-customer banks resulted in volume gains early in the sample but generated volume losses during the last two years of the study.
- Mergers between two or more Reserve Bank customers have resulted in volume losses, especially in the first quarter after the merger.

Quarterly Net Gain (Loss) in Federal Reserve Check Volume as a Result of Merger Activity

Second Quarter 1996 to First Quarter 2002



Source: Author® calculations.

- On average, the estimated cumulative loss of volume during the first five post-merger quarters was 2.6 million checks.
- While the overall number of checks in the United States has declined during the past few years, the Federal Reserve has lost additional check-processing volume because of bank mergers.

Implications

The Federal Reserve is most vulnerable to volume losses resulting from mergers between two institutions of different types, such as when a money center bank buys a regional bank, or a regional bank buys a community bank. This is because one of the merging banks, typically the larger institution, may have already been bypassing the Federal Reserve by presenting directly and receiving direct presentments and may be a clearinghouse member. Following the merger, this bank may continue to use its pre-merger check-processing method for all checks from both institutions. The smaller bank's volume would be processed the same way as the larger partner's volume had been processed previously.

The decline in the Federal Reserve's check-processing volume has had other causes besides mergers, such as conversion of paper checks to ACH debits at the point of sale or at the lockbox.

Is Poland the Next Spain?

by *Francesco Caselli and Silvana Tenreyro*

complete text: <http://www.bos.frb.org/economic/ppdp/2004/ppdp0408.pdf>

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Motivation for the Research

Between 1950 and 2000, real labor productivity in some of Western Europe's richest countries was more than three times that of some of its poorest. By the end of the century, this ratio was well below two. A notable aspect of the decline in cross-country European inequality is the catch-up by the Southerners: Italy first, then Spain, Greece, Portugal, and eventually Ireland (a Southerner in spirit) all had spurts of above-average productivity growth.

Spain's experience is emblematic: In less than 15 years between the late 1950s and the early 1970s, its labor productivity relative to France's (the authors' benchmark for the "average" European experience) went from roughly 65 percent to over 90 percent.

On May 1, 2004, the European Union (EU) admitted 10 new members, primarily from Eastern Europe. To varying degrees, the Easterners' current relative labor productivities are similar to those of the Southerners before their convergence spurts. This widely noted analogy has given rise to hope that the Easterners will be the new Southerners, and Poland, the new Spain. Indeed, this hope is one of the reasons these countries have wanted to join (and several others hope to join) the EU.

With so many people pinning such great hopes on the continued ability of the European club to generate convergence among its members, this paper revisits the data on the relative growth performance of European countries in the second half of the twentieth century to assess the prospects of the Easterners' repeating the Southerners' success.

Research Approach

The overall approach is to look behind the aggregate labor productivity numbers and present a number of different approaches to decompose the overall convergence experience into more disaggregated processes. The discussion is organized around four hypotheses potentially explaining the convergence process:

1. Grounded in the Solovian-neoclassical hypothesis, the first hypothesis holds that initially capital-poor countries have higher marginal productivity of capital, and hence faster growth.
2. The second hypothesis explains the convergence process as the result of technological catch-up. Backward countries converge to the technological leaders mainly through a process of imitation.
3. The third hypothesis interprets the convergence process as driven mainly by gains from trade from European integration, which may have been disproportionately larger for the poorer economies (as a proportion of GDP), both because of their initially more autarchic status and because of their relatively smaller size.
4. The fourth hypothesis holds that convergence is a by-product of structural transformation, which is partly a process of reallocation of resources from low-productivity to high-productivity sectors. If initially poorer countries had a longer way to go in this transformation, this process may itself have been a source of convergence.

Key Findings

- The data suggest that a critical mechanism for Spain's explosive catch-up was a vast redeployment of labor out of agriculture towards higher value-added sectors. With a much larger agricultural sector than France, Spain benefited disproportionately.

- In general, Southerners converged to the rest mainly through a faster rate of reallocation of the labor force from low-productivity agriculture to high-productivity manufacturing and services, although in some cases, including that of Spain, within-industry catch-up was also quite important.

- With respect to the relative contributions of capital deepening and technological change to the reduction of European inequality between 1960 and 2000, physical capital accumulation and total factor productivity (TFP) growth were roughly equally important, although TFP was not always initially lower in poor countries. However, the contribution of human capital accumulation—at least as measured by years of schooling—was negligible.

- Despite substantial convergence, Spanish average labor productivity has hovered at around 90 percent of French average labor productivity since the mid 1970s. The data indicate that this persistent remaining gap is due mostly to an equally persistent gap in human capital per worker.

- The new and forthcoming EU members—including Poland, a focus of the authors—exhibit very large labor productivity gaps vis-à-vis Western Europe, and the gaps are accounted for by disparity in physical capital and TFP, but not by disparity in human capital. These countries have substantially larger shares employed in agriculture, which tends to be the least productive sector, than do the Westerners, and their manufacturing and services sectors are also less productive than the corresponding sectors in the West—although the gaps are not as large as in agriculture. There is, therefore, scope for large productivity gains both via labor reallocation out of agriculture and through within-industry catch-up.

- However, in Eastern Europe the distribution of employment among sectors is much less important as a source of productivity gaps vis-à-vis the rest of Europe than it was in Southern Europe in 1960.

- For Poland, and for the Easterners generally, the road to convergence passes through physical-capital deepening and through TFP gains at the industry level. This means that convergence may take quite a bit longer than it did for the Southerners. On the other hand, unlike Spain and the Southerners generally, Poland and the Easterners can anticipate a complete catch-up, as they are not hobbled by a human-capital handicap.

Implications

Implications for the first two hypotheses are mixed. Poorer countries experienced faster physical capital deepening, and this explains about 50 percent of their relative gains. Poorer countries also experienced faster TFP growth, accounting for the remaining 50 percent. However, neoclassical growth theorists may be disoriented by the lack of convergence in human capital. And endogenous growth theorists may be disoriented by the fact that not all initially poorer countries lagged the rest technologically, so that their continued faster TFP growth does not square well with the technology catch-up story that these theorists would probably favor.

As an explanation for regional convergence, the trade view (the third hypothesis) runs into some problems: For example, countries with a comparative advantage in agriculture tend to show systematically lower shares of agriculture.

The structural transformation approach fares better as an explanation of convergence by the Southerners in the latter half of the twentieth century. As mentioned above, the Southerners converged to the rest mainly through a faster rate of reallocation of the labor force from low-productivity agriculture to higher-productivity sectors.

Interstate Fiscal Disparity in State Fiscal Year 1999

by Robert Tannenwald and Nicholas Turner

complete text: <http://www.bos.frb.org/economic/ppdp/2004/ppdp0409.pdf>

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Motivation for the Research

In state fiscal year 1999 (FY1999), the nation's state and local governments collectively enjoyed a surplus equal to 2.5 percent of their spending. However, while fiscally healthy in the aggregate, states varied considerably in their fiscal condition. More importantly, the size of the nationwide state and local fiscal surplus provides no insight into differences across states in their inherent capacity to raise revenue, regardless of short-term economic fluctuations, nor does it illuminate their exposure to long-run spending pressures that are difficult to control.

This paper compares states in terms of these two fiscal characteristics using data for FY1999. It is the fourth in a series of reports by Tannenwald, the last of which used data for FY1997. This series, in turn, succeeds a series of similar reports undertaken by the U.S. Advisory Commission on Intergovernmental Relations over a 30-year span from FY1962 to FY1991.

Research Approach

Like the previous series and the previous reports in this series, this report employs the representative tax system (RTS) and the representative expenditure system (RES) to measure interstate differences.

RTS assesses the relative ability of a state to raise revenue from a particular tax by levying a "standard" tax rate on a "standard" tax base. The RES approach estimates the amount that state and local governments must spend to provide a standard level of service for each representative bundle of state and local spending.

For each state, the authors construct a measure of fiscal need and a measure of tax capacity. They then construct a measure of fiscal comfort for each state by dividing the state's tax capacity index by its index of fiscal need. They also compute tax effort, to measure the degree to which a state utilizes its taxing capability.

Key Findings

- In FY1999 as in FY1997, the New England, Mid-Atlantic, Pacific, and Mountain regions had above-average fiscal capacity, while the South Atlantic, East North Central, West North Central, East South Central, and West South Central regions had below-average capacity. Regions (and states) with high fiscal capacity tended to have high average incomes.
- As in past years, the dispersion in fiscal need was considerably narrower than the dispersion in fiscal capacity. With the exception of Connecticut, the New England states displayed their characteristically low fiscal need, all ranking in the bottom quartile. Connecticut's high RES score relative to the other New England states is attributable primarily to its high unit labor costs.
- States with high fiscal need in all regions tend to have high poverty rates, high concentrations of population in the age bracket of 5- to 17-year-olds, high crime rates, or some combination of the three. They tend to be concentrated in the South and Southwest.
- Between FY1997 and FY1999, the dispersion across states in fiscal need narrowed, as did the dispersion in fiscal capacity. Two demographic factors are primarily responsible for changes in a state's fiscal need during this interval: (1) a change in the state's relative poverty rate, and (2) a

change in the relative importance of school-age children in the state's population mix.

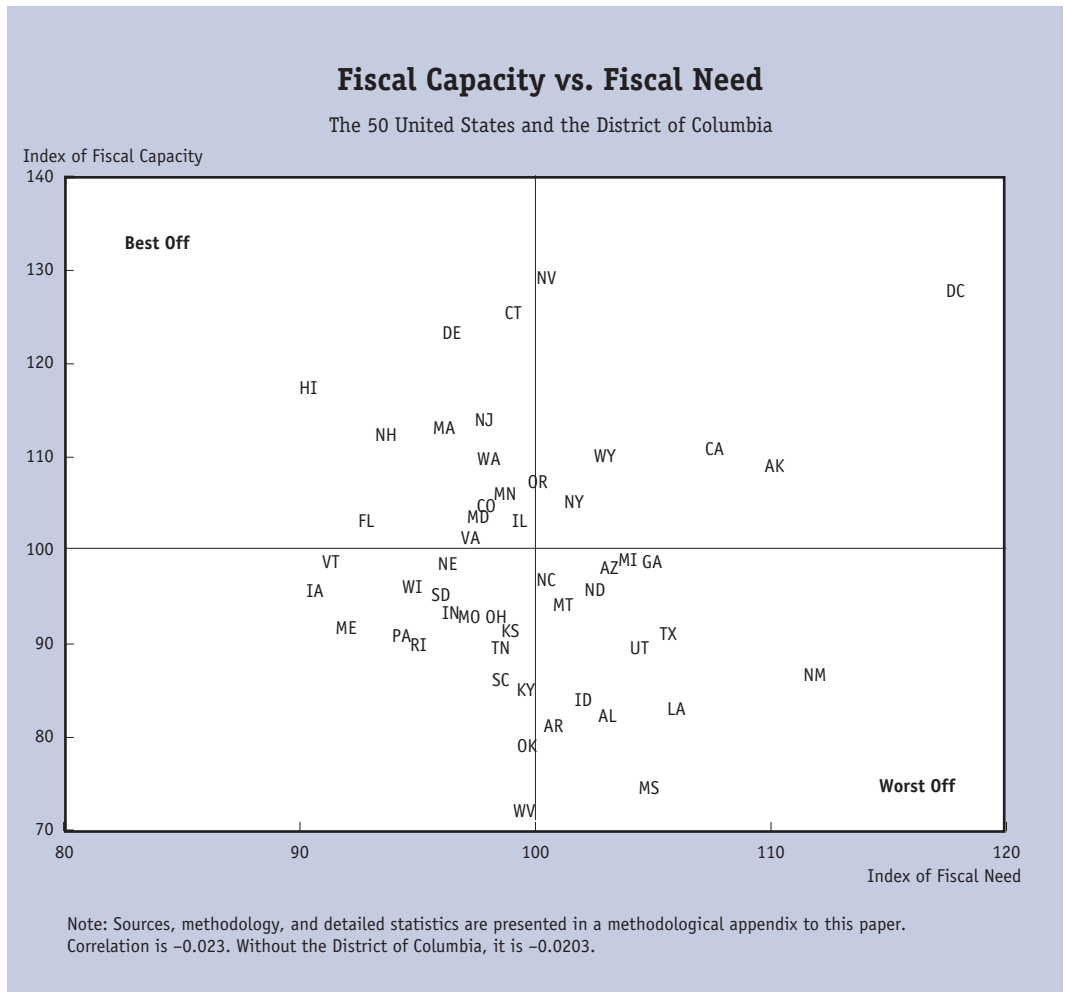
- As the figure shows, only six states have both higher-than-average fiscal need and capacity, and only 13 states have both low need and high capacity. The remaining states lie in the lower quadrants or on the border, indicating low capacity. Fourteen of these states have both high relative need and low relative capacity. Nationally, the correlation between fiscal need and fiscal capacity, while negative, is statistically insignificant.

- The fiscal comfort of the Census regions converged between the two years. Disparity among the states in fiscal comfort also diminished. As in FY1997, New England was the most fiscally comfortable region in the nation, despite a three-percentage-point decline in its fiscal comfort index.

- In FY1999, regions with above-average tax effort included the Mid-Atlantic region, New England, and the East North Central region. The remaining regions all exhibited lower-than-average tax effort. There is no statistically significant relationship between fiscal comfort and tax effort, and only five states exhibit high tax effort and low fiscal comfort.

Implications

The relationship between fiscal capacity and fiscal need has repercussions for the “devolution” debate. In the context of intergovernmental relations, devolution means the “devolving” of fiscal responsibilities from higher to lower levels of government, especially from the federal to the state or provincial level. Opponents of devolution in the United States are concerned that states with high fiscal need and low fiscal capacity would be unable to provide their residents with an accept-



able level of state and local public services. Opponents would be less concerned if states with the highest fiscal need also had the highest fiscal capacity.

The evidence from this paper is mixed on this issue. The correlation between fiscal need and fiscal capacity is statistically insignificant. But there are more than a few states with both high need and low capacity, and this is a concern.

The absence of a negative correlation between state tax effort and fiscal comfort suggests that states with low levels of public expenditures tend to spend less because they want to, not because they are constrained by a lack of revenue.

Nevertheless, the persistence of fiscal disparity suggests that it might be appropriate for Congress to consider increasing the degree of fiscally equalizing intergovernmental aid.

p-04-10

Social Security and Unsecured Debt

by Erik Hurst and Paul Willen

complete text: <http://www.bos.frb.org/economic/ppdp/2004/ppdp0410.pdf>

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Motivation for the Research

Most young households simultaneously hold both unsecured debt on which they pay an average of 10 percent interest and social security wealth on which they earn less than 2 percent. Nationally, consumer revolving debt currently totals about \$700 billion, while social security wealth is about \$11 trillion. As a nation, we are apparently borrowing on credit cards and saving in a pass-book savings account.

This paper documents this inefficiency and explores ways to reduce it.

Research Approach

The authors focus on the old-age portion of social security and explore this topic in three steps. First, using data from the Panel Study of Income Dynamics (PSID), they examine the distribution across individuals of non-collateralized debt and social security wealth to see whether the households who owe the debt are the same as those who have the wealth. Second, they develop a dynamic, life-cycle, portfolio choice model that reflects the assumption that the world is populated by two types of households: *tempted* households who care about the future but face an overwhelming desire to consume all available resources in the current period, and *disciplined* households, who face no such desire. Third, they conduct two policy experiments aimed at alleviating the inefficiency of simultaneous debt and social security holdings.

In the first experiment, households currently in the social security system are allowed to access their social security wealth to pay off debt. In the second experiment, young households are exempted from making social security payments.

The paper is agnostic on the issue of how social security is funded. Nor do the authors take any stand on changing the financing of the social security system. In other words, they estimate how their proposals would affect the solvency of a pay-as-you-go system. The policy experiments require households to contribute at least as much to social security in present-value terms as they do in the current system and to leave the benefit portion of social security unchanged.

Key Findings

- Simply allowing households to use the money they have paid in to the social security system to pay off debt would allow many households to get out of debt completely and others to dramatically reduce their exposure to high-interest unsecured debt.

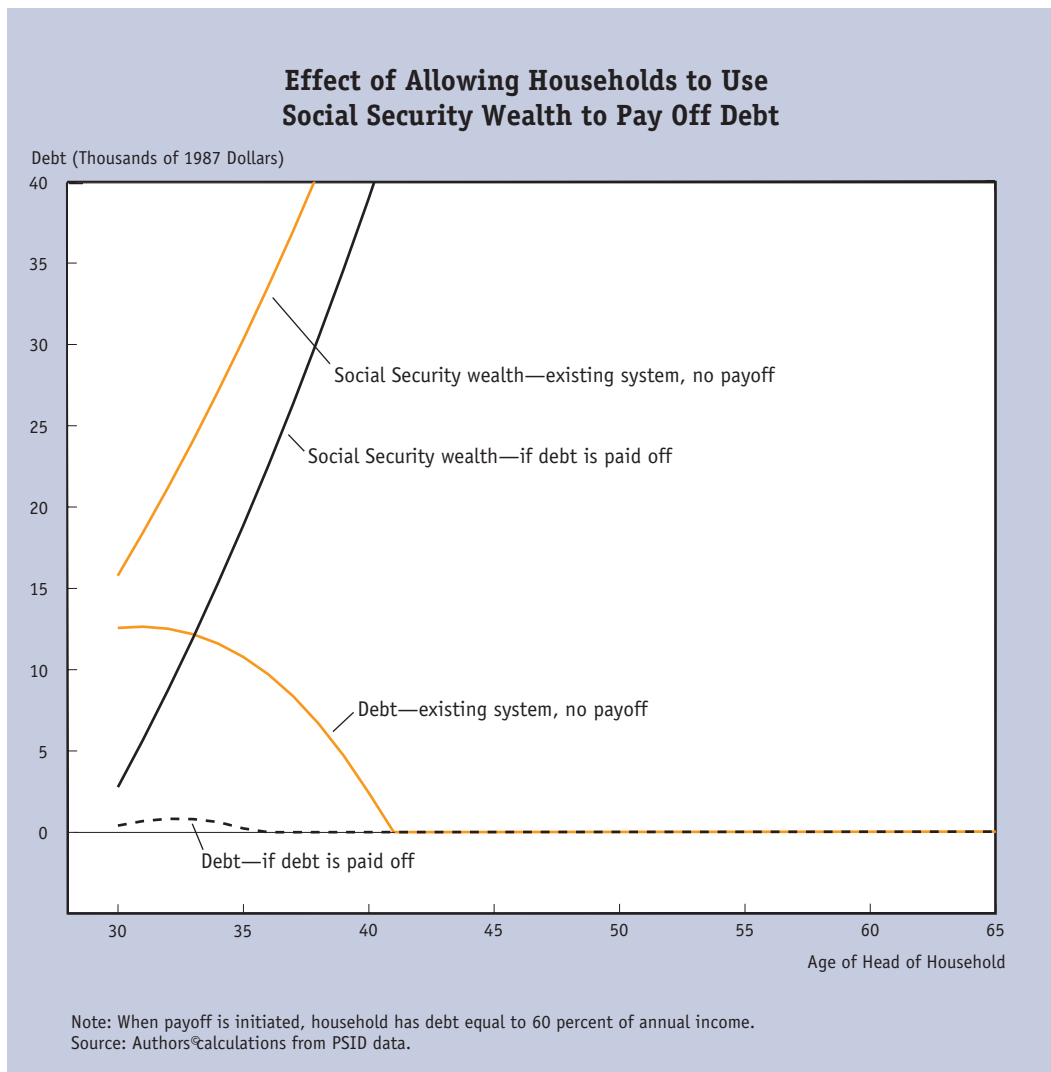
- If households could access their social security wealth to pay off debt, only 17 percent would still have debt. And for that 17 percent, debt would be dramatically reduced; for the 90th-percentile household in the debt distribution, unsecured debt would fall from 84 percent to 33 percent of that household's average income.

- Both experiments, but particularly the one that allows exemptions for younger households, solve the problem in question and lead to significant increases in household welfare, consumption, and saving, and to reductions in high-interest, unsecured debt.

- Moving from the existing system to one in which households whose head is under 30 are exempt from contributing to social security (but are forced to make up the taxes later in life) raises certain-equivalent consumption by 3.4 percent for disciplined households and by 3.3 percent for tempted households.

- With the exemptions, disciplined households come closer to approximating the optimal allocation across risky and riskless assets without actually investing any of their social security wealth in risky assets.

- The welfare gains from the “loans” the government makes to households by allowing them



to borrow against their social security wealth are so great that the government could charge a higher internal borrowing rate and still make households better off. In other words, the government could borrow at 2 percent, lend at 5 percent, and still make households better off!

Implications

The options explored in this paper generate comparable and often higher welfare increases than popular proposals to increase the return on investment in social security. And they do so without any major administrative change to the social security system. There are no individual accounts. There is no uncertainty about returns. And the proposals preserve the basic functions of social security: They do not subject tempted households to politically unacceptable risks.

The main point of the paper—that the ideal life-cycle profile of contributions is not flat—applies equally well to any tax. Given the choice, households with a hump-shaped income profile would rather pay less income tax when young and more income tax when middle-aged.

The authors focus on social security for two reasons. First, the explicit purpose of social security, unlike that of other U.S. taxes, is to smooth life-cycle consumption. So it is particularly ironic that the contribution structure does precisely the opposite at certain points in the life cycle. Second, a progressive income tax approximates the ideal life-cycle structure by lowering tax rates when income is low. Since social security taxation is, in fact, regressive, not progressive, it is a natural target for the authors' analysis.

A model that incorporates both endogenous labor supply and general equilibrium would strengthen the results significantly. However, for one policy proposal—the age-30 exemption—neither extension should have a sizable effect on the conclusions.

Working Papers

w-04-3

Trade Liberalization and the Politics of Financial Development

by *Matías Braun and Claudio Raddatz*

complete text: <http://www.bos.frb.org/economic/wp/wp2004/wp043.pdf>

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Motivation for the Research

It has been extensively documented that the level of financial development, however measured, varies greatly across countries. However, the ranking of countries varies through time. Our theories of financial development need to explain both the relatively high persistence in degree of financial depth as shown in key indicators and the non-trivial changes in the ranking across countries at different moments in time. Existing theories—which rely on stable and largely predetermined institutional features—successful as they are in explaining the cross-sectional variation, are challenged when applied to the time-series dimension of the data.

Research Approach

This paper builds on the premise that a well-developed financial system enhances competition in the industrial sector by allowing easier entry. The authors document this fact by showing that both aggregate manufacturing-sector price-cost margins and average firm size—representing measures of incumbents' rents or the inverse of the degree of competition in an industry—are significantly negatively correlated with financial development across countries. They show, however, that there is important heterogeneity in the impact of financial development on these measures across industries.

The authors split industries into two equal-sized groups, according to whether the benefits of easier access to external finance outweigh the costs of increased competition, and call them the promoters and opponents of financial development, positing that the relative strength of each group determines the equilibrium level of financial system sophistication. Absent significant perturbations to this political economy equilibrium, they do not expect significant changes in financial development.

Trade liberalization is a perturbation to the relatively high persistence of private credit. The paper uses an event study and regression analysis to study the change induced by trade liberalization in the relative strength of promoters across 41 trade-liberalizing countries to see whether this is a good predictor of subsequent financial development.

Key Findings

- The change in the relative strength of promoters induced by trade liberalization is a very good predictor of subsequent financial development.
- Evidence suggests that the relation between changes in relative strength of promoters and subsequent financial development is mediated by policy adjustments—especially adjustments to policies that induce change in the financial sector—made in the five-year period following trade liberalization.
- By overcoming informational and agency problems, a well-functioning financial system can foster growth through two main channels: by increasing resources available for investment and by better allocating these scarce funds. The results provide some indication that it is allocation that is the more affected.

- The effects of trade liberalization are particularly strong in countries with relatively high levels of governance, suggesting that incumbents resort to this costly but more subtle way of restricting entry when the degree of governance would make it difficult to obtain more blatant forms of anti-competitive measures from politicians.

Implications

Although deep institutional reasons play a role, to an important extent countries have the level of financial development they choose. Policy convergence to best-practice standards is not likely to happen automatically unless the political-economic conditions for such a change are present.

Policies that on average have a liberalizing effect on markets are not by themselves enough to guarantee their extension to the financial system. They can even worsen the situation. In this context, understanding the interrelation between sectoral reforms and adjusting the timing accordingly seems of first-order importance.

w-04-4

Emerging Market Business Cycles: The Cycle is the Trend

by Mark Aguiar and Gita Gopinath

complete text: <http://www.bos.frb.org/economic/wp/wp2004/wp044.pdf>
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Motivation for the Research

While business-cycle fluctuations in developed markets may have moderated in recent decades, business cycles in emerging markets are characterized increasingly by their large volatility and dramatic current account reversals. In this paper the authors explore whether a standard real business-cycle model can qualitatively and quantitatively explain business-cycle features of both emerging and developed small open economies.

Research Approach

Having observed frequent policy-regime switches in emerging markets, the authors take as their underlying premise that emerging markets are subject to substantial volatility in their trend growth rates relative to developed economies. Consequently, shocks to trend growth—rather than transitory fluctuations around the trend—are the primary source of fluctuations in these markets.

The authors document several features of economic fluctuations in emerging and developed small open economies and show how a standard real business-cycle model reproduces to a large extent the business-cycle features of both emerging and developed economies. The stochastic, dynamic, general-equilibrium model has two productivity processes—a transitory shock around the trend growth rate of productivity and a stochastic trend growth rate.

The authors estimate the parameters of the stochastic process using generalized method of moments; data from a prototypical emerging market, Mexico; and, as a benchmark, data from a developed small open economy, Canada. Using the Kalman filter and the estimated parameters, they decompose the observed Solow residual series for Mexico into trend and transitory components and then feed the decomposed Solow residuals for Mexico through the model. Finally, using VAR analysis, they explore the premise that “the cycle is the trend,” for emerging markets, using the methodology of King, Plosser, Stock, and Watson to perform a variance decomposition of output into permanent and transitory shocks.

Key Findings

- A standard business-cycle model can explain important differences between emerging markets and developed economies once the composition of shocks that affect these economies is appropriately modeled.
- Specifically, a model that accounts appropriately for the predominance of shocks to trend growth relative to transitory shocks characteristic of emerging markets reproduces the current account and consumption behavior observed at business-cycle frequencies.
- When calibrated to the much more stable growth process of developed small open economies, the same model generates weaker cyclicity of the current account and lower volatility of consumption, consistent with the data.
- The estimated process for productivity in Mexico implies a trend volatility that is over twice that of the transitory shock; in the case of Canada, this ratio is roughly one-half.

Implications

Without recourse to additional market imperfections, a standard model does surprisingly well in explaining emerging markets—particularly the facts about consumption and the current account—once the composition of shocks is modeled appropriately. However, this is not to say that market imperfections are not important in emerging markets. In particular, these features may be necessary for understanding why what we term productivity is so volatile in emerging markets.

w-04-5

Defaultable Debt, Interest Rates, and the Current Account

by Mark Aguiar and Gita Gopinath

complete text: <http://www.bos.frb.org/economic/wp/wp2004/wp045.pdf>
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Motivation for the Research

World capital markets have experienced large-scale sovereign defaults on a number of occasions, the most recent being Argentina's default in 2002. While Argentina, which has experienced five default or restructuring episodes in the last 180 years, may be an extreme case, sovereign defaults occur with some frequency in emerging markets. Other characteristics of emerging markets are that defaults occur in equilibrium, interest rates and net exports are countercyclical, and interest rates and current accounts are positively correlated.

This paper develops a quantitative model of debt and default in a small open economy to match the above facts, with the aim of explaining the dynamics that produce these characteristics.

Research Approach

The authors develop a model of a small open economy that receives a stochastic endowment stream and trades a single good and a single asset, a one-period bond, with the rest of the world. To emphasize the distinction between the roles of transitory and permanent shocks, they present two extreme cases of their model. Model I represents the case in which the only shock is a transitory shock around a linear trend; Model II represents the case in which the trend itself is stochastic. The model is solved numerically, using the discrete state-space method.

To improve on the results, the authors augment Model II with a phenomenon observed in many default episodes—bailouts. They model bailouts as a transfer from an unmodeled third party to creditors in the case of default.

Key Findings

- The model's ability to match the facts in the data improves substantially when the productivity process is characterized by a volatile stochastic trend as opposed to transitory fluctuations around a stable trend.
- For models with purely transitory shocks, default is a rare event, as it occurs on average only once every 1,250 years. This, in turn, leads to a counterfactually stable interest-rate process. Moreover, the cyclicity of the interest rate is the opposite of the cyclicity of net exports, while in the data both are countercyclical and positively correlated in emerging markets.
- The rate of default increases by a factor of ten when the model with the stochastic trend is substituted for the model with transitory shocks. Furthermore, both the current account and interest rates are countercyclical and positively correlated.
- Allowing for bailouts of fairly modest levels compared with those observed in practice enables the model to match the extreme rates of default observed in many Latin American economies. The model also matches the countercyclicity of net exports and interest rates. However, by breaking the tight link between default and interest rates, the model fails to produce reasonable volatility in the interest rate.
- While the predictions remain short of matching the magnitudes shown in the data, the predicted signs of the correlations of income, net exports, and the interest rate are in line with empirical facts.

Implications

The reason a model with trend shocks performs better than one with transitory shocks is that in an environment with trend shocks, a given probability of default is associated with a smaller borrowing cost at the margin. This, in turn, rests on the fact that trend shocks have a greater impact on the propensity to default than do standard transitory shocks, making interest rates relatively less sensitive to the amount borrowed and relatively more sensitive to the realization of the shock.

w-04-6

Effective Labor Regulation and Microeconomic Flexibility

by Ricardo Caballero, Kevin N. Cowan, Eduardo M. R. A. Engel, and Alejandro Micco

complete text: <http://www.bos.frb.org/economic/wp/wp2004/wp046.pdf>

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Motivation for the Research

Microeconomic flexibility, by facilitating the ongoing process of creative destruction, is at the heart of economic growth in modern market economies.

The main obstacle to microeconomic flexibility is adjustment costs. Some of these costs are purely technological, while others are institutional. Chief among the latter is labor market regulation, in particular, job security provisions. Although the literature on the impact of labor market regulation on labor markets is extensive and contentious, there is agreement that job security provisions reduce restructuring.

Despite this consensus, the empirical evidence supporting the negative impact of labor market regulation on microeconomic flexibility is scant at best. This is not surprising, as the obstacles to empirical success are legion. In this paper, the authors make a new attempt to develop empirical

evidence supporting the proposition that job security provisions reduce restructuring and thus limit microeconomic flexibility.

Research Approach

The authors develop a methodology that enables them to bring together an extensive new data set on labor market regulation constructed by Djankov et al., with comparable cross-country, cross-sectoral data on employment and output from the UNIDO data set. They emphasize the key distinction between effective and official labor market regulation.

The methodology builds on the simple partial-adjustment idea that larger adjustment costs are reflected in slower employment adjustment to shocks. The accumulation of limited adjustment to these shocks builds a wedge between frictionless and actual employment, the main right-hand-side variable in this approach.

The authors propose a new way of estimating this wedge, enabling them to pool data on labor market legislation with comparable employment and output data for a broad range of countries. As a result, they are able to enlarge the effective sample to 60 economies, more than double the country coverage of previous studies in this literature. Their approach to measuring effective labor regulation combines existing measures of job security provision with measures of rule of law and government efficiency.

Key Findings

- Countries where effective job security legislation is in place adjust more slowly to imbalances between frictionless and actual employment.
- In countries with strong rule of law, moving from the 20th to the 80th percentile of job security lowers the speed of adjustment to shocks by 35 percent and cuts annual productivity growth by 0.86 percent.
- The same movement – from the 20th to the 80th percentile of job security – in countries with low rule of law reduces the speed of adjustment by only approximately 1 percent and productivity growth by only 0.02 percent.

Implications

Many papers have shown that, in theory, job security regulation depresses firm-level hiring and firing decisions. However, conclusive empirical evidence on the effects of job security regulation has been elusive. In this paper, the authors fill some of the empirical gap by developing a methodology that exploits (1) the recent publication of two cross-country surveys on employment regulations and (2) the homogeneous data on employment and production available in the UNIDO dataset. By combining the measures of employment regulation with various proxies for law enforcement, they also solve the problem posed by differences in the degree of regulation enforcement across countries.

A General-Equilibrium Asset-Pricing Approach to the Measurement of Nominal and Real Bank Output

by J. Christina Wang, Susanto Basu, and John G. Fernald

complete text: <http://www.bos.frb.org/economic/wp/wp2004/wp047.pdf>
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Motivation for the Research

In many service industries, measuring real output is a challenge because it is difficult to measure quality-adjusted prices. The financial services industry lacks even an agreed-upon conceptual basis for measuring *nominal*, let alone *real*, output. Conceptually, the most vexing measurement issue arises because banks and other financial service providers often do not charge explicit fees for services, but rather incorporate the charges into an interest rate margin—the spread between the interest rates they charge and pay.

In this paper, the authors address the lack of an agreed-upon conceptual basis for measuring bank output and propose resolutions of some major long-standing debates on this issue.

Research Approach

The authors develop and analyze an optimizing model with financial intermediaries that provide financial services to resolve asymmetric information between borrowers and lenders. These intermediaries are embedded in a dynamic, stochastic, general-equilibrium model in which assets are priced competitively according to their systematic risk, as in the standard consumption capital-asset-pricing model.

Key Findings

- The model demonstrates the conceptual shortcoming in the existing national accounting measure of bank output: By counting the risk premium as part of nominal bank output, the current national income accounting measures treat economically identical alternative funding institutions differently and, as a result, also alter the output of the borrowing firm depending on its source of funding.
- The correct reference rate for measuring nominal bank lending services must incorporate the borrower's risk premium; that is, the borrower's risk premium is not part of bank output, and one should use an *ex post*, rather than an *ex ante*, measure of the risk premium on bank funds in the reference rate.
- The logic of the model also applies to loans to households (for example, mortgages and credit cards). The implication is that, to avoid overstating GDP, one should not count the risk premium in such loans as part of either bank output or the consumption of financial services by the household sector.
- The model highlights the conceptual problem in the bank output measure employed by the micro banking literature, which uses the deflated size of banks' portfolio of interest-bearing assets (loans plus market securities).
- The appropriate price deflator for financial services is not generally the overall price level; financial services are a kind of information product, similar to other information processing services, such as consulting.
- Capital gains should be counted as part of financial services output only if the return is an anticipated implicit compensation for actual services rendered.

Implications

The model yields one overarching principle for measuring bank output: Focus on the flow of actual services provided by banks. This principle applies equally to measuring nominal and real banking output—and, by implication, to measuring the implicit price deflator for financial services.

The model, and its implied measure of bank output, can be readily applied to valuing implicit services by financial institutions other than banks, such as insurance companies. The general principle is the same: Apply asset pricing theories to price the financial instrument by itself; the difference between that value and the security's actual value yields the nominal value of the implicit services.

More generally, the authors advocate a model-based approach to measurement for conceptually challenging areas of financial services.

w-04-8

Incomplete Markets and Trade

by Paul Willen

complete text: <http://www.bos.frb.org/economic/wp/wp2004/wp048.pdf>

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Motivation for the Research

Researchers have recently documented significant differences in the structure and function of financial markets across countries. Much of this research explores how such differences can affect the level and growth of economic activity, but little addresses the subject of this paper: how financial markets affect the balance of trade in goods across countries.

Research Approach

The author employs a two-period, exponential-normal, general-equilibrium model with incomplete markets and with countries composed of heterogeneous households. The assumptions of exponential utility and normally distributed endowments and asset payoffs, common in the literature, allow for analytical solutions (but also lead to well-known shortcomings, chief among them being an implication of exponential utility: that absolute tolerance for risk is unaffected by the level or variance of consumption).

Key Findings

- Incomplete markets lead to trade imbalances. Among countries that would engage in balanced trade if markets were complete, trade imbalances emerge when some markets are absent.
- When markets are incomplete across countries—that is, when risky assets do not span national income—for a small, open economy, the more highly correlated national income is with internationally traded risky assets, the lower is the trade deficit.
- Even when markets are complete across countries, market incompleteness within countries—that is, when assets do not span all individual household income streams—can still lead to trade imbalances.
- Countries with more-complete markets run trade deficits with countries with less-complete markets.
- The more national income is spanned by risky assets, the smaller is a country's trade deficit with the rest of the world.
- The paper contributes to the theory of international trade in financial assets and to the

theory of incomplete markets by (1) extending Svensson's laws of comparative advantage for international trade in assets to economies with heterogeneous agents and (2) showing that the R^2 of a regression provides a useful measure of market incompleteness both for countries and for individuals.

Implications

The theory discussed in the paper leads to several potentially testable propositions. As mentioned above, researchers have developed measures of financial development, and one could explore the relationship between these measures and trade imbalances. It is worth noting that the United States, with the most sophisticated capital markets in the world, has more-complete markets than any other country. Thus, the fact that the United States also runs large trade deficits is consistent with the theory. On the other hand, the existence of large U.S. trade deficits is inconsistent with the finding that the more national income is spanned by risky assets, the smaller is a country's trade deficit.

Published Articles and Testimony

- **Katharine Bradbury**

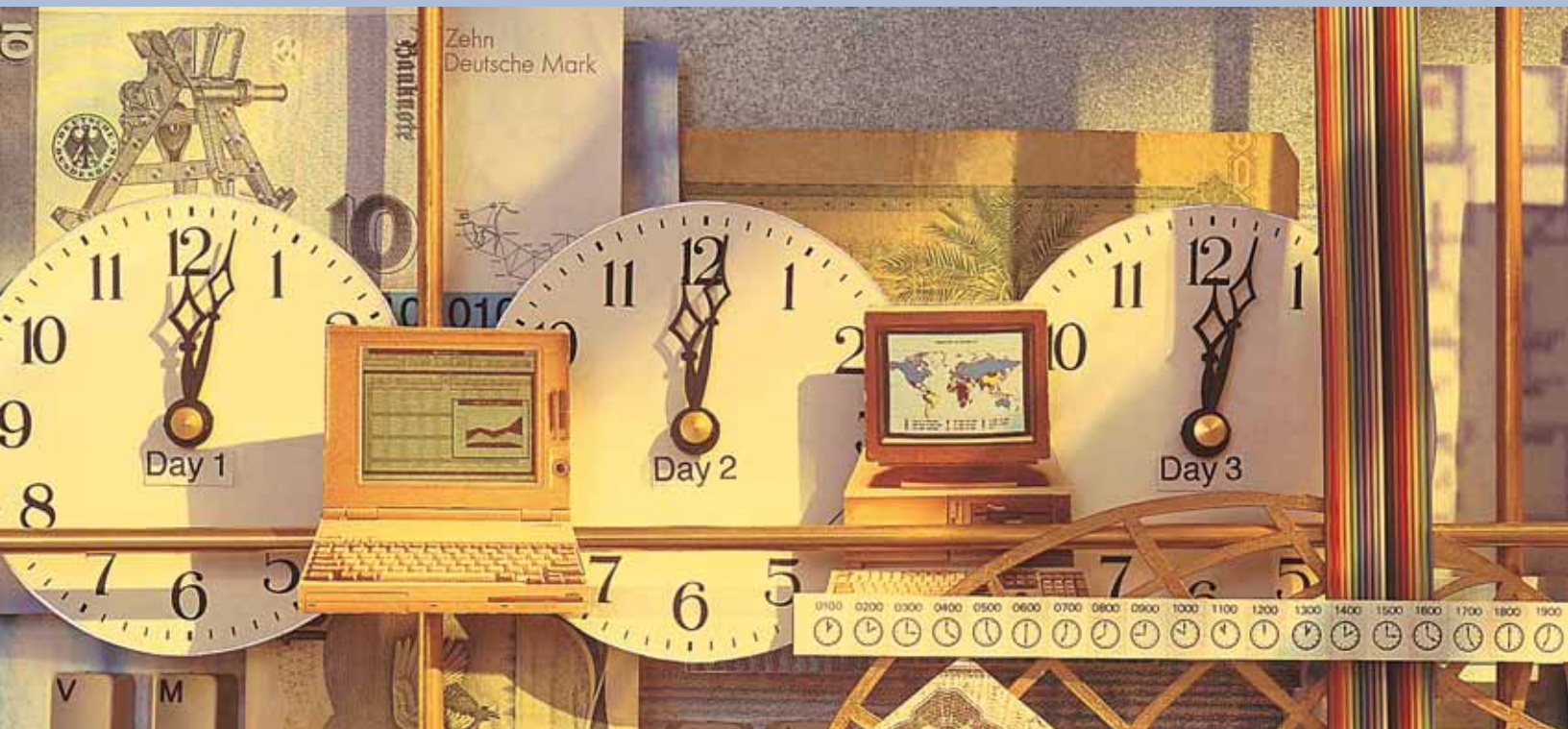
“Discussion of the Papers by Downes, Sonstelie and Stiefel, Rubenstein, and Schwartz,” 2004. *Education Finance and Organizational Structure in New York State Schools*. Symposium Proceedings. Education Finance Research Consortium, State University of New York (SUNY) at Albany. Available online at <http://www.albany.edu/edfin/Symposium%20Papers.html>.

- **Yolanda Kodrzycki**

Testimony before the Massachusetts Joint House and Senate Ways and Means Committee revenue hearing on December 6, 2004. Revenue Hearing Materials. Testimony and Presentations by Dr. Yolanda Kodrzycki, Federal Reserve Bank of Boston. Available online at http://www.mass.gov/coaf/revenue_hearing_materials.html.

- **Robert Tannenwald**

“Are State and Local Revenue Systems Becoming Obsolete?” 2004. Research Report on America’s Cities. National League of Cities, Washington, DC 20004-1763, and Metropolitan Policy Program, The Brookings Institution. Available online at <http://www.brookings.edu/es/urban/publications.htm> and http://www.nlc.org/resources_for_cities/publications/1637.cfm.



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