

# Dancing with Wolves: Syndicated Loans and the Economics of Multiple Lenders

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firm's passage from borrowing from a single lender to using multiple lenders is often viewed as an inevitable progression in the life of a firm. While there is a strong element of truth in this view, it is also incomplete. The underlying economics of moving from one lender to many involves more than simply asking whether the firm's revenues are large enough to cover the costs of adding more lenders or of acquiring a public debt rating. The U.S. syndicated loan market provides a useful laboratory for exploring the economics of multiple lenders. In this article, Mitchell Berlin discusses recent research on the syndicated loan market that has attempted to answer questions related to firms' use of multiple lenders.

Banking scholars have viewed a firm's passage from borrowing from a single lender to using multiple lenders (and finally to borrowing on public bond markets) as an inevitable characteristic of the life cycle of a growing firm. According to this view, small



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Banking and Financial Markets section. This article is available free of charge at [www.philadelphiafed.org/econ/br/index](http://www.philadelphiafed.org/econ/br/index).

firms borrow from a single bank, middle-market firms borrow from multiple banks, and large firms use multiple sources of finance. While there is a strong element of truth in this view, it is also very incomplete. The underlying economics of this decision involves more than simply asking whether the firm's revenues are large enough to cover the transaction costs of adding one or more lenders (e.g., providing another set of financial statements) or the costs of getting a public debt rating.<sup>1</sup> Recent research has shown that the number of lenders fundamentally affects the nature of the firm's relationship with its lenders.

In the U.S., the *syndicated loan* market is a particularly useful laboratory for exploring the economics of mul-

tiple lenders. (See *Syndicated Loans*.) A syndicated loan is one in which the loan is parceled among a number of banks, ranging from two lenders to more than 30 in some cases.<sup>2</sup> From the firm's side, we can think of the syndicated loan as a formal substitute for negotiating and signing a bunch of separate agreements with multiple lenders on its own. Everything else equal, the firm — especially a large firm — can borrow at a lower loan rate when no single lender is too heavily exposed to that firm. When a bank has a well-diversified loan portfolio, losses on a single loan will lower the lender's profits but will not threaten the lender's solvency. In turn, the lender can charge a lower rate because the loan poses less risk to the return on the lender's entire portfolio. Accord-

<sup>1</sup> One piece of evidence that firm size alone doesn't explain the number of lenders is that there is substantial international variation in the number of lenders used by firms of similar size. For a sample of middle market and large firms, Steven Ongena and David Smith document that the median number of lenders ranges from over 10 in Italy and Portugal to just two banks in Norway, Sweden, the United Kingdom, and Ireland. A sample of U.S. firms comparable in size to those in Ongena and Smith's sample would have a median of three or four. There is a growing literature that seeks to explain these differences in the number of lenders per firm. The results from this literature are still preliminary, and I don't discuss them in this article.

<sup>2</sup> Although commercial banks make the lion's share of syndicated loans, other types of intermediaries, including finance companies, investment banks, and hedge funds, also hold syndicated loans. Indeed, finance companies and investment banks are sometimes lead arrangers. Since nothing in this article hinges on the distinctions among different types of lenders, I will often use the terms *bank* and *lender* interchangeably.

## Syndicated Loans

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he U.S. syndicated loan market has grown very rapidly in the last 10 years: from \$137 million of new syndicated loans in 1987 to well over \$1 trillion in 2006 (see the Figure). From the lender's standpoint, the syndicated loan is an

efficient way to lend to its larger customers while maintaining a diversified loan portfolio. The originating bank keeps a fraction of the loan — the amount depends on contractual issues that I discuss at length in the text of this article — while the majority of the loan is held on the books of the other syndicate members.

In a syndicated loan, the contract is negotiated between a lead bank and the borrower. Currently, 62 percent of the deals are originated by three lead banks — JP Morgan (29 percent), Bank of America (18 percent), and Citigroup (15 percent) — with no other bank originating more than 6 percent of the deals. During the recent wave of loans to finance mergers, investment banks such as Goldman Sachs have played an increasingly prominent role. Commonly, multiple loans are negotiated at the same time; for example, the deal may include both a line of credit and a term loan.

After the terms are negotiated, pieces of the loan are then sold to other lenders, each of which holds a pro rata share of the original loan. Legally, each member of the syndicate has a separate agreement with the borrower. Thus, unlike certain types of loan sales or many mortgage-backed securities — in which the cash flows and collateral from the original loan can be sliced and diced in many ways — each member of the syndicate has a loan that differs only in its size. The main formal responsibility of the lead bank is to service the loan, that is, to receive and distribute loan payments to syndicate members, oversee the collateral, and so forth. I use the word *formal* because bank regulations require all syndicate members to perform due diligence and to monitor the loan, no matter how small their share. In practice, the lead bank takes disproportionate responsibility for monitoring the borrower.

There is significant variation in the structure of syndicated loans, and the size of the borrowing firm is the

single most important factor determining the structure. Using the sample from Amir Sufi's article, which includes over 12,000 syndicated deals from 1992 to 2003, the total sales of the borrowers range from \$48 million (10<sup>th</sup> percentile), to \$367 million (50<sup>th</sup> percentile), to \$3.5 billion (90<sup>th</sup> percentile). Thus, borrowers in the syndicated loan market range from middle-market firms to the very largest firms in the world. In Sufi's sample, deal sizes range from \$40 million (10<sup>th</sup> percentile), to \$150 million (50<sup>th</sup> percentile), to \$8.5 billion (90<sup>th</sup> percentile).<sup>\*</sup> To gain some perspective, \$1 million is the usual ceiling that empirical researchers use to define a small business loan.

Syndicate size ranges from two lenders (10<sup>th</sup> percentile), to five lenders (50<sup>th</sup> percentile), to 18 lenders (90<sup>th</sup> percentile), and the share of the loan retained by the lead bank ranges from 8 percent (10<sup>th</sup> percentile), to 24 percent (50<sup>th</sup> percentile), to 56 percent (90<sup>th</sup> percentile).

Note that the lead bank holds at least a quarter of the total loan in half of the deals. This relatively high number suggests that significant impediments to diversification exist in this market. Many of the larger deals involve multiple lead banks. Pascal Francois and Franck Misonnier-Pierra argue that the lead banks divide up the administrative tasks according to comparative advantage.

### FIGURE

#### Size of the U.S. Syndicated Loan Market

Year	Dollars, bil
1996	960
1997	1,120
1998	1,103
1999	1,050
2000	1,220
2001	1,170
2002	930
2003	780
2004	1,290
2005	1,480
2006	1,416

Source: *Bank Loan Report*, various issues

<sup>\*</sup> U.S. bank regulators collect information on all syndicated loans, loan commitments, standby letters of credit, and leases with a value greater than \$20 million that are held by at least three lenders in the shared national credit (SNC) program.

ing to this logic, lenders and borrowers will seek to achieve maximum diversification by increasing the number of lenders as much as possible (subject to the additional transaction costs of borrowing from multiple banks).

But lender diversification is not the only factor that affects the cost of borrowing through a syndicated loan. Steven Dennis and Donald Mulineaux have described syndicated lending as an intermediate form of financing on a continuum ranging from *relationship lending* — which involves close and continuous monitoring of the firm by its lender — to *transactional lending* — which involves arm's length interactions between the borrowing firm and its lender(s). The size and structure of loan syndicates and the structure of syndicated loan contracts provide evidence about the terms of the tradeoffs a firm faces when it moves from a single lender to multiple lenders.<sup>3</sup> Indeed, it is useful to think of the loan syndicate as an institution *designed* to govern the interactions between the firm and its lenders and between the lenders. Factors such as the share held by the lead bank, the number and identity of syndicate members, and, for that matter, the loan contract itself are designed to balance the benefits and costs of using multiple lenders.

Some of the questions that can be addressed by examining the syndicated loan market are: What types of firms borrow through syndicated loans? What is the optimal number of lenders? How does increasing the number of lenders affect banks' ability to monitor firms? And to what extent do lending syndicates facilitate or inhibit

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<sup>3</sup> Existing evidence doesn't permit us to quantify the share of the syndicated loan market among all loans made to borrowers who use multiple lenders.

contract renegotiation? In the last few years, researchers have made a lot of progress in answering these questions.

## MULTIPLE LENDERS REDUCE THE HOLD-UP PROBLEM

**Lending Relationships Create Informational Monopolies.** From the firm's standpoint, maintaining a close, continuing lending relationship with a single bank has numerous benefits. Notably, the lender becomes better informed about the firm's business over time. For example, an essentially healthy firm's cash flows might drop temporarily. A bank with long experience lending to the firm can more easily distinguish temporary financial difficulties from the beginnings of more serious financial problems and is less likely to mistakenly seek to protect itself by raising the firm's loan rate, cutting its credit line, or increasing collateral requirements.

But much of the knowledge gained through years of experience is *soft information*; that is, it can't necessarily be easily coded and transmitted to another lender. This gives the firm's banker an informational advantage over potential competitors and endows the firm's bank with a degree of monopoly power over its long-time borrowers. For example, even if the firm's financial problems are temporary, the firm's bank might nonetheless take the opportunity to raise the firm's loan rate — an example of what contract theorists call the *hold-up problem*. Of course, the firm can threaten to take its business to another lender. But any new bank faces an inference problem because it knows less about the firm than the firm's long-time lender. The potential lender will reason: "If we actually succeed in capturing the firm's business, it's likely that the firm's current lender knows something we don't and the firm's problems really are serious." Accordingly, the potential com-

petitor will make the loan only at a high loan rate, if at all. Since potential competition is weakened by the original lender's informational monopoly, long-term borrowers will pay higher than a fully competitive rate and long-time lenders can capture what economists call *informational rents*.

**Empirical Evidence of Hold-Up Problems in Banking.** Recently, financial economists have found convincing evidence that hold-up problems are not just a theoretical possibility. In her working paper, Carola Schenone follows a sample of firms for a number of years before and after their *initial public offering* (IPO), when they first sell stock to the public. A private firm — a firm whose stock is held by a small number of investors — is not required by law or by custom to publish detailed information about its profitability. However, after it sells stock to the wider public in an IPO, a firm is required by law to provide a lot of information to the Securities and Exchange Commission (SEC), the primary regulator in securities markets; this information is also available to the investing public. In addition, publicly traded firms are closely followed by financial analysts, who make a living evaluating the prospects of the firms they cover. So, when a firm goes public, more market participants are actually producing information about the firm. Schenone finds that following an IPO, the firm's main bank lender immediately begins charging lower loan rates to the firm, evidence that the bank originally had an informational monopoly but that wider availability of information about the firm has undermined its monopoly power.

João Santos and Andrew Winton's article examines how lending relationships change when information about firms becomes routinely available. They examine two groups of firms: firms that have access to public debt

markets and bank-dependent firms.<sup>4</sup> Unlike the case with firms that borrow exclusively from banks (and other private lenders such as finance companies), a significant amount of public information is routinely available about firms that sell bonds. Santos and Winton show that bank-dependent firms pay higher rates than firms that have access to bond markets. They also show that while all firms pay higher bank loan rates in recessions — because the risk of default is higher during recessions — loan rates rise more for bank-dependent firms.<sup>5</sup> This is consistent with the view that banks' market power over borrowers is greatest when their private information is most valuable, that is, when other potential lenders' concerns about a firm's creditworthiness are likely to be greatest.

Joel Houston and Christopher James's article provides evidence that multiple banks reduce hold-up problems. A firm heavily engaged in R&D

may be particularly prone to being held up by its lender because the firm's prospects depend heavily on activities for which information is neither publicly available nor easy to interpret. Indeed, the profitability of much R&D activity depends crucially on the information being kept secret from other market

banks may reduce the severity of the hold-up problem, having multiple lenders also creates its own set of problems. Studying the structure of loan syndicates and syndicated loan contracts provides insights into these problems. Although not all firms that borrow from multiple banks take out syndi-

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participants. Houston and James show that firms with larger R&D expenditures reduce their reliance on bank debt if they borrow from a single bank. In contrast, for those firms that borrow from multiple banks, larger R&D expenditures are associated with more bank debt. These results suggest that firms at severe risk of hold-up — firms with a single bank lender — reduce their lender's bargaining power by reducing indebtedness; when the firm has multiple lenders, it can take on more debt with less risk of hold-up.<sup>6</sup> That said, although a firm with heavy R&D expenditures may have a strong incentive to diversify its funding sources, hard-to-interpret information also tends to limit the number of potential lenders (as I discuss in detail in the next section).

While borrowing from multiple

cated loans, we can think of the loan syndicate as an institution designed specifically to mitigate the problems that arise with multiple lenders. As a fast-growing segment of the corporate debt market, the market for syndicated loans is also interesting in its own right.

#### **INCENTIVES TO MONITOR DECLINE WHEN THERE ARE MULTIPLE LENDERS**

In the modern theory of the banking firm, banks are viewed as specialists both in evaluating the creditworthiness of borrowers (screening) and in keeping close tabs on borrowers once they have taken out a loan (monitoring). (From now on I'll use the word *monitoring* to refer to both screening and monitoring.) A single lender that holds a borrower's entire loan is exposed to all of the losses should the loan go bad. Thus, we expect this bank to have a strong incentive to monitor the firm closely.<sup>7</sup> However, the lower the bank's share of the loan, the

<sup>4</sup> The authors define a firm as bank-dependent in two ways: (1) if it has never issued public debt; or (2) if its *last* bond issue was a private placement. Their results hold under either definition. It is worth noting that Santos and Winton's sample of bank-dependent borrowers includes firms that have a single lender and firms that borrow from multiple banks. This sampling decision assumes that hold-up problems do not completely disappear when a firm uses more than one bank. Interestingly, Santos and Winton find that bank-dependent borrowers are less likely to take out successive loans from the same bank than borrowers with access to public debt markets. This suggests that bank-dependent borrowers seek to exploit interbank competition more than borrowers for whom public bond markets provide an alternative to banks. Thus, hold-up problems appear to be relevant for firms borrowing from multiple lenders through syndicated loans.

<sup>5</sup> The sophisticated reader will wonder whether loan rates rose disproportionately because of some (unmeasured) firm characteristic that affected both loan rates and access to public debt markets. The authors address this concern using *instrumental variables*. The basic idea of this technique is to find factors that plausibly affect a firm's access to bond markets but have no direct effect on loan spreads, for example, inclusion in the S&P 500 index or membership in the NYSE.

<sup>6</sup> I'm simplifying Houston and James's results a little. Although they do present results for R&D, their main result is that firms with larger *growth opportunities*, that is, profitable future investments, rely less on bank debt when they have a single lender and more on bank debt when they have multiple bank lenders. They measure growth opportunities by Tobin's *Q*: the market value of the firm's assets divided by the book value of the firm's assets. A value of *Q* higher than 1 indicates the existence of growth opportunities (as valued by stock market participants).

<sup>7</sup> In addition, the possibility of capturing informational rents increases banks' incentives to monitor the firm, as shown by Giovanni Dell'Ariccia and Robert Marquez.



smaller its exposure to loss and the less incentive it has to monitor the loan closely. So a large number of banks holding small pieces of the total loan would have little reason to monitor at all.

This limits the amount of the loan that can be syndicated. Some bank must hold a large enough share of the loan to provide adequate incentives to monitor the borrower on behalf of all lenders. In loan syndicates, the largest share of the loan is held by the lead bank, which typically holds approximately one-quarter of the borrower's loan for the median size syndicated loan.<sup>8</sup> Of course, the requirement that a single bank retain a substantial share of the loan reduces the potential risk diversification benefits of syndicating the loan. The share of the loan retained by the lead bank balances the gains from providing the lead bank with proper incentives to monitor the firm against the lost diversification benefits. The efficient balance will be different for different types of borrowers.

In particular, we expect that the relative difficulty of providing proper incentives to the lead banker to monitor will be more important for *informationally opaque* firms, that is, firms for which information is not readily available or easily interpreted. When syndicate members have less information about the firm, they must rely more on the lead bank to keep tabs on the borrowing firm on their behalf.

But how can we measure informational opacity? Empirical researchers have ranked firms using a firm's degree of integration into public securities markets as an indicator of opacity. A firm that has gone public through an

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<sup>8</sup> Note that by delegating the task of monitoring to the lead bank, which retains a large share of the loan, the loan syndicate also avoids wasteful duplication of effort by the syndicate members.

IPO must routinely provide information to the SEC, and market participants can readily access this information. Firms that also have a public debt rating from an agency like Standard and Poor's are subject to an even higher level of scrutiny in the marketplace. So we can rank firms from the opaque (private firms), to moderately opaque (public firms without rated debt), to transparent (public firms with a debt rating).

In their article, Dennis and Mullineaux show that the likelihood of a loan's being syndicated at all is greater for public firms than it is for private

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firms and that it is greater yet for firms with a debt rating. A reasonable interpretation of this result is that a syndicated loan must yield diversification benefits high enough to at least overcome the fixed costs of organizing the syndicate, for example, hiring the lawyers to write documents, and so forth. For sufficiently opaque borrowers, the lead bank would have to hold such a large share of the loan that the diversification benefits would be simply too small to cover these costs. Furthermore, Amir Sufi's article shows that for loans that actually are syndicated, the share of the loan retained by the lead bank is higher and the syndicate is likely to be smaller for more opaque firms.

The identity of the syndicate members also depends on the informational opacity of the firm. Sufi shows that for more opaque firms, syndicate members are more likely to be located in the same state as the

firm and are also more likely to have lent to the firm in the past. In both cases, the bank is likely to have greater familiarity with the firm, even though there may be little publicly available information about the firm.<sup>9</sup> Consistent with the view that the share of the loan retained by the lead bank is related to its role in monitoring opaque firms, Sufi's findings show that for transparent firms — those that have a public debt rating — there is no relationship between borrowers' credit rating and the share held by the lead bank. Thus, it is not the risk of the firm, per se, but the syndicate mem-

bers' information about the firm that is important.

## **MULTIPLE LENDERS CREATE COORDINATION PROBLEMS**

**Large Syndicates Impede Efficient Renegotiation.** Banking scholars argue that lending relationships facilitate flexibility through loan renegotiation. While it is relatively easy for a single lender to renegotiate loan terms with a borrower, it may be very difficult for many lenders to coordinate in negotiations. Furthermore, heterogeneous lenders — for example, lenders with widely varying exposures to the borrower —

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<sup>9</sup> Sufi also finds that for opaque borrowers, syndicate members are more likely to have been members of past syndicates that included the lead bank. This suggests that reputation effects may be important. A lead bank is less likely to shirk its task of monitoring if it knows that angry syndicate members will refuse to join future lending syndicates formed by that lead bank.

may find it hard to coordinate.<sup>10</sup> This has implications for both the size and the structure of loan syndicates.

In my article with Loretta Mester, we argue that flexibility is a key feature of bank loans and that renegotiation and monitoring are intertwined. Once a bank grants a loan, it continues to monitor the firm through a number of different devices. One device is the loan covenant, a contractual restriction that, for example, might require the borrower to keep its net worth above some level or keep its liquid assets above some minimum level. These covenants are tripwires. If the firm's net worth falls below some level, this is an occasion for a more detailed investigation by the bank. If the bank determines that the firm is essentially healthy, it will renegotiate the loan terms to avoid placing the firm in default. However, multiple lenders, especially multiple lenders whose interests are not identical, are a barrier to negotiation. In a large loan syndicate, the originator of the loan can predict that renegotiations will not be easy to coordinate, and contracts will include less stringent covenants. In this sense, large syndicates can undermine the use of covenants as a monitoring device.

#### **Large Syndicates May Be Designed to Impede Negotiations.**

According to the preceding view, barriers to negotiation lead to excessive default, and syndicates will be designed to achieve as much flexibility as possible. A second view, however, has been emphasized by Patrick Bolton and David Scharfstein. When it is easy to renegotiate a loan, a borrower may take excessive risks or act in other ways that would reduce the firm's ability to repay the

<sup>10</sup> This has been empirically verified by Stuart Gilson, Kose John, and Larry Lang, among others.

loan in full. If lenders can't credibly threaten to liquidate the firm — for example, if the firm's assets are much more valuable when the firm remains a going venture — the firm knows its lenders have a weak bargaining hand. The borrower knows its lenders will want to renegotiate the loan to minimize their losses, rather than punish the firm by imposing a default. However, syndicates can be designed to make renegotiation more difficult.

### **Covenants are pervasive in syndicated loan agreements. Furthermore, covenants are set tightly.**

Increasing the number of lenders in a syndicate or including members with a strong incentive to hold out in negotiations may discipline the borrower (who can't assume that he can bargain his way out of default).<sup>11</sup>

**Evidence Shows That Ease of Renegotiation Is Valuable.** Covenants are pervasive in syndicated loan agreements. In his working paper, Sufi finds that over 60 percent of loan syndications have at least one financial covenant. Furthermore, covenants are set tightly. Ilia Dichev and Douglas Skinner find that over 30 percent of the loans in their sample suffer covenant violations, many of them multiple times. They report that most of the covenant violations are

<sup>11</sup> In Bolton and Scharfstein's model, the central tradeoff is that multiple borrowers impose more discipline on borrowers but lead to excessive default when the borrower has bad luck. The optimal number of creditors weighs these two factors.

*technical violations* — that is, the firm does not actually miss a loan payment — and that covenant violations typically lead to renegotiation rather than default. Thus, the firms that violate covenants in Dichev and Skinner's sample are having financial difficulties, but few are in serious financial distress. This evidence is consistent with our view that syndicates permit routine monitoring through covenants without leading to too many inefficient defaults.<sup>12</sup>

The combination of stringent contracts and flexibility will be most valuable for certain types of borrowers. For example, in the model used in my study with Mester, tight covenants are most valuable for borrowers with high credit risk. These borrowers can lower their borrowing costs by accepting tight covenants that restrict their opportunities for taking excessive risks. But tight covenants also increase the likelihood that the firm will find itself in breach of a covenant, even though the firm is basically healthy. For such firms, the option to renegotiate is most valuable.

**Evidence Shows That Syndicates Are Designed to Inhibit Renegotiation for High-Risk Firms.** However, in his working paper, Sufi finds that syndicate size is typically *larger* for firms with worse credit ratings, an empirical finding that appears incon-

<sup>12</sup> Mark Pyles and Donald Mullineaux also present some fascinating but preliminary evidence about contractual restrictions on syndicate members' ability to resell their loans. In their sample of rated firms between 1999 and 2003, over two-thirds of the loans have at least one of three types of restrictions on resale, which include requiring the borrower's or the lead bank's approval to sell or a minimum amount (usually \$5 million) that can be sold. The authors find that resale restrictions are more likely for lower rated firms. The most likely interpretation of Pyles and Mullineaux's findings is that the originator seeks to control the size of the syndicate for firms more likely to face financial problems. This is a particularly interesting area for further research.

sistent with the model in my study with Mester because larger syndicates face larger coordination problems. Interestingly, Sufi shows that the larger syndicate is created by adding lenders with very small shares. He argues convincingly that the designer of the syndicate is explicitly creating a class of lenders that will hold out in any negotiations because their exposure to loss is small. The addition of this fringe of lenders with small exposures will tend to create serious coordination problems should contracts need to be renegotiated.<sup>13</sup>

**A Possible Reconciliation of Two Views.** In fact, Sufi's evidence that syndicates are designed to inhibit renegotiation in the event of default and Dichev and Skinner's evidence that syndicate loan contracts are both stringent and routinely renegotiated are not necessarily inconsistent because the contractual conditions for renegotiating various types of contractual terms differ.<sup>14</sup> The standard syndicate contract requires unanimous

<sup>13</sup> Benjamin Esty and William Megginson find evidence that project finance syndicates are larger in countries where creditor rights are weak. Project finance syndicates make collateralized loans to fund particular investment projects, for example, a new power plant. Esty and Megginson interpret their finding as evidence that syndicates are designed to inhibit renegotiation in countries where legal sanctions for default are weak and lenders can be at a relative disadvantage in loan renegotiations.

<sup>14</sup> The apparent differences between the two sets of results are almost surely not due to different samples of firms or different time periods. Both studies use the same database, and their sample periods overlap substantially. Although Sufi recognizes the tradeoffs involved in having many lenders, he doesn't appear to view the evidence that renegotiation occurs routinely as a challenge for his conclusions.

consent of all syndicate members for the renegotiation of the *core contractual terms*: the loan rate, the principal amount, the maturity of the loan, or collateral requirements. In negotiations over any of these contractual terms, even a lender with a very small exposure has a lot of power to influence negotiations.

Matters are different for financial covenants. Although there is less uniformity across syndicates for financial covenants than for core contractual terms, the typical syndicate contract will require lenders holding at least two-thirds of the value of the loan to agree to change a noncore contractual term, such as a financial covenant. (The minimum fractions required to change a noncore term range from one-half to three-quarters.) This means that in negotiations over financial covenants, a lender with a small exposure will seldom be decisive.


Thus, it is plausible that loan syndicates are designed to be very tough in contract negotiations over the core contractual terms — to maintain a credible threat to discipline borrowers — while they are also designed to permit monitoring through stringent covenants that can be renegotiated relatively easily, thereby avoiding a costly default every time a covenant is breached. However, this is only a preliminary hypothesis; further research is necessary to gain a definitive answer.

## CONCLUSION

Although a close lending relationship with a single bank can be valuable to a borrowing firm, the bank gains monopoly power over the firm as it gains better information about the firm than other potential lenders. This idea

was first articulated by banking scholars in the 1990s, but researchers have only recently produced convincing direct evidence of the hold-up problem in banking relationships. Overcoming the hold-up problem is one motivation for a firm to give up some of the benefits of an exclusive lending relationship by borrowing from multiple lenders.

We gain a better understanding of what the firm gains and loses in borrowing from multiple lenders by examining the syndicated loan market, in which a lead bank originates a loan, to which other lenders then subscribe. For firms large enough for a syndicated loan to be profitable, the syndicated loan offers some of the aspects of relationship loans while reducing the monopoly power of any single bank. From the lenders' perspective, loan syndications permit banks to make loans to relatively large firms while maintaining a diversified loan portfolio.

Recent evidence suggests that loan syndicates are designed to provide appropriate incentives to monitor the firm by the originating bank; for example, the share retained by the lead bank is larger for informationally opaque firms. Although the evidence is not yet conclusive, loan syndicates also appear to be designed to permit contractual flexibility along some dimensions — financial covenants are relatively stringent, but they are frequently renegotiated — while limiting contractual flexibility on core contractual terms such as the loan rate and the loan maturity. Preliminary evidence also suggests that restrictions on syndicate members' ability to sell their loans are designed to regulate the terms on which syndicated loans can be renegotiated. 

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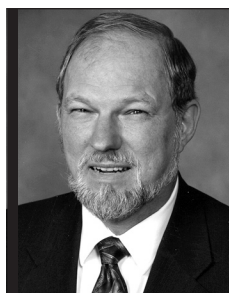
# A Pattern of Regional Differences in the Effects of Monetary Policy

BY THEODORE M. CRONE

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lthough there is only one national monetary policy, that does not mean that monetary policy does not affect some regions of the country more than others. We know that business cycles differ across states and regions, and a number of studies have examined how monetary policy may affect regions differently and why. A review of these studies reveals that certain parts of the country are consistently more affected by monetary policy than others. Identifying the reasons for regional differences in the effects of monetary policy may help us better understand how changes in monetary policy ripple through the economy. In this article, Ted Crone reviews where the research has brought us so far.

Federal Reserve officials are sometimes asked how monetary policy can help solve regional economic problems. The standard answer is straightforward: There is only one national monetary policy, and it is not designed to address purely regional issues. This does not mean, however,



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that monetary policy does not affect some regions of the country more than others. Business people, civic leaders, and government officials may want to know how much their region will be affected by changes in monetary policy relative to the rest of the country. We know that business cycles differ across states and regions, and over the past decade, a number of studies have examined what role monetary policy may play — i.e., how monetary policy may affect regions differently and why. A review of these studies reveals that certain parts of the country are consistently more affected by monetary policy than others. So far, the only convincing explanation for these differences is the different mix of industries in the regions. But the search for other reasons is likely to continue.

Identifying the reasons for regional differences in the effects of monetary policy may help us better understand how changes in monetary policy ripple through the economy. This article will review where the research has brought us so far.

## BUSINESS CYCLES DIFFER ACROSS STATES AND REGIONS

It is widely recognized that there are differences in business cycles across states. In some cases, it is the depths of the recessions, and in others, it is the timing of recessions. Differences in cycles across multi-state regions in the U.S. are less pronounced than differences across individual states, but they are still discernible.

Two recent studies have used a newly developed set of coincident indexes for the 50 states to define and compare state recessions. In an earlier *Business Review* article, I used these indexes to examine recessions at the state level based on the traditional definition of a recession — a significant decline in economic activity that lasts for several months. Using the same set of indexes, in a second study, economists at the St. Louis Fed applied a standard technique, known as a Markov switching model, to identify different phases in each state's economic cycle. Both articles find that the 50 states have experienced different business cycles in terms of their number, timing, and severity.

Other studies have examined the issue from a different perspective. How closely are the cyclical movements in income or employment correlated across the states? In a study published in 2001, Christophe Croux and his co-

authors proposed a new statistic, called a cohesion index, which measures the co-movement of regional economies over the business cycle. They apply the measure to personal income in the 50 states and find that while the correspondence among the states is higher than the correspondence among the European countries, it is not perfect. In a 2004 article, Gerald Carlino and Robert DeFina calculate the same statistic for employment in eight major industry groups across 38 states for which data are available. A value of one would indicate a perfect correlation of industry employment by state across business cycles. Thus, for an industry with a cohesion index of one, quarterly increases and decreases in employment due to the business cycle would be proportional across all the states.<sup>1</sup> The cohesion measures in the study range from 0.82 for manufacturing to 0.44 for mining. Thus, business cycles for the major industries differ across the states. The co-movement of income or employment among multi-state regions is stronger than the co-movement among the states, but again, it is not perfect.<sup>2</sup> In effect, grouping states together smooths out some of the individual features of business cycles, but it does not eliminate them.

Since business cycles differ across states and across regions in the U.S., it is natural to ask whether differential effects of monetary policy are a factor. Answering this question requires a

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<sup>1</sup> A cohesion index of zero would indicate no systematic relationship in industry employment growth across the states. A negative index would indicate that industry employment in some states moves in the opposite direction as employment in other states.

<sup>2</sup> In a related study Carlino and Sill (2001) found that the change in the cyclical component of *per capita* income is highly correlated across regions except for the Far West. But the volatility of *per capita* income across the business cycle varies significantly from region to region.

consistent framework to measure the effect of monetary policy on the economies of states or regions.

### ESTIMATING THE REGIONAL EFFECTS OF MONETARY POLICY

In recent years economists have turned to econometric models known as vector autoregression (VAR) models to measure the effects of changes in monetary policy on states and regions. A VAR is a system of equations for estimating the historical relationship between a variable, such as personal income in a region, by past values of that variable and by current and past values of other variables, such as the short-term interest rate targeted by the Federal Reserve (the fed funds rate). Using this type of model, we can estimate the effect of an unanticipated change in the fed funds rate on income in a state or region. These effects are known as impulse responses. Of course, the estimates will differ depending on what variables are included in the model and what assumptions are made. For example, do changes in monetary policy affect income in the current period or only in later periods? And do shocks to one region's economy spill over directly to the economies of other regions?

The recent studies differ somewhat in their assumptions. But all of the studies include in their models three key variables: personal income in each region, the fed funds rate, and some measure of oil prices or commodity prices in general. Some of the models add other variables to this list, such as the rate on 10-year Treasury bills. In each study, the regional effects of monetary policy are measured by the response over time of the region's personal income to an unanticipated change in the fed funds rate. All of the models assume that unanticipated changes in the fed funds rate affect

personal income with a lag of at least one quarter.

Ideally, we would like to estimate the effects of monetary policy on each of the 50 states in a single model. But VAR models are suitable only for a limited number of variables, not the 50 plus variables that would be required to include each of the states in the same model. Therefore, the differential effects of monetary policy have generally been estimated by region rather than by state.<sup>3</sup> And most of the studies use the eight regions defined by the Bureau of Economic Analysis (BEA).<sup>4</sup>

**The Earliest Model.** About 10 years ago in the *Business Review*, Gerald Carlino and Robert DeFina published the first of the recent articles that used a VAR model to estimate the regional effects of monetary policy.<sup>5</sup> They assume that monetary policymakers can react to a shock or unanticipated change in a region's personal income growth in the same quarter. Personal income, however, responds to changes in monetary policy only in subsequent quarters because monetary policy affects the economy only after some time lag. The authors also assume that any change to personal income in one region can spill over to

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<sup>3</sup> In their 1999 article, Carlino and DeFina use 48 separate models, one for each of the contiguous 48 states, to estimate the effects of monetary policy on each of the states. Since each of the estimates is derived from a slightly different model, the estimates would not necessarily be the same as those derived from a single model containing all 48 contiguous states.

<sup>4</sup> The eight BEA regions are New England, Mideast, Southeast, Great Lakes, Plains, Southwest, Rocky Mountain, and Far West. It is customary to remove Alaska and Hawaii from the Far West region because their economies differ significantly from the other states in that region.

<sup>5</sup> See Carlino and DeFina's 1996 *Business Review* article. A more technical version of this study was published in the *Review of Economics and Statistics* in 1998.

other regions in subsequent periods. Thus, there can be a ripple effect across regions.

On the basis of these assumptions, Carlino and DeFina estimate the cumulative response of real personal income growth in each of the eight BEA regions to an unanticipated increase in the federal funds rate.<sup>6</sup> The maximum effect in each region of an unanticipated change in the federal funds rate occurs after two to two-and-a-half years. In three of the eight BEA regions, the cumulative effect is significantly different from the national average after a few quarters and remains significantly different through 20 quarters. Figure 1 shows the cumulative responses for these three regions. In the Great Lakes region, the effect of changes in monetary policy on personal income is significantly *greater* than the national average. In the Southwest and Rocky Mountain regions, the effect is significantly *less* than the national average. This pattern reoccurs to some extent in most other studies of the regional effects of monetary policy.

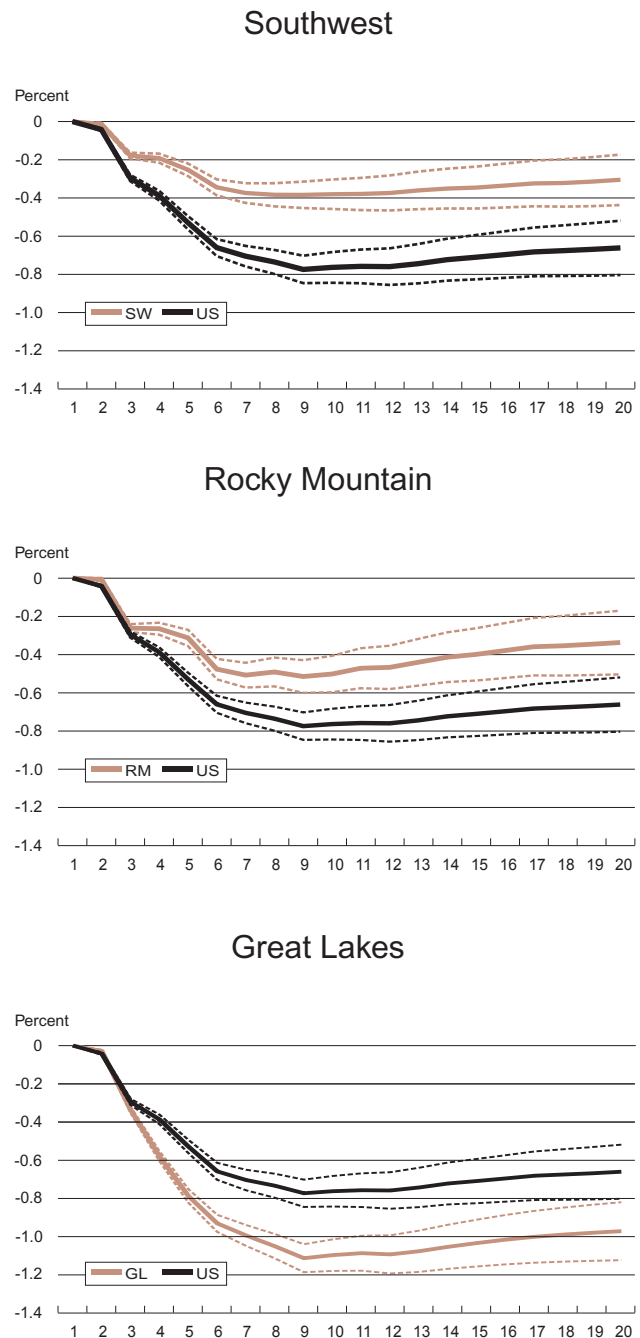
In a recent study on grouping states into regions, I found additional support for Carlino and DeFina's findings. In the 1950s the BEA grouped contiguous states into eight regions based on a number of economic and social characteristics at that time. But there was no attempt to ensure that states in the same region had similar business cycles, an important consideration for analyzing regional business cycles. I grouped contiguous states into regions based on how closely their economies moved together over the business cycle. (See *Alternative Definitions of Regions in the U.S.*) It turns out that over the past quarter century, the business cycles in some states were more closely aligned with those in states in neighboring BEA regions than those in their own region.<sup>7</sup> Although the realignment of states into different regions was based on a purely statistical measure of the similarity in business cycles, some of the realign-

<sup>6</sup> Specifically, they estimate the cumulative effect of a 0.83 percent increase in the fed funds rate, which is one standard deviation of the unanticipated change in the fed funds rate based on their model.

<sup>7</sup> This coordination of business cycles could be the result of a similar mix of industries or trading patterns or similar responses to national fiscal or monetary policy. The constraint that regions consist of contiguous states meant that some states whose cycles were similar were not included in the same region.

**FIGURE 1**

**Responses of Personal Income for the BEA Regions**



**Note:** The solid lines represent the cumulative effect on personal income in the designated quarter resulting from a change in the federal funds rate in quarter one. The dashed lines represent the 95 percent confidence intervals for the estimated impulse responses. Based on the model, the true impulse responses have only a one in 20 chance of being outside that range.

ment was obvious. For example, most observers would not question that the oil-rich economy of Louisiana, which is in the BEA's Southeast region, is much closer to that of Texas and Oklahoma, which are in the BEA's Southwest region, than to the economies of the other states in the Southeast region.

Using this alternative definition of regions, I replicated Carlino and DeFina's original study. The same basic patterns emerged as in the original study, but the results were stronger. The effects of monetary policy were significantly different from the national average in more regions than in the original study (Figure 2). The impulse responses were more precisely estimated for the alternative regions than for the BEA regions. The states around the Great Lakes formed the most significantly affected region just as in the original study. But the West was also affected more significantly than the U.S. average. The Energy Belt was the least affected region in the replication. This region contains six of the nine states in the BEA's Southwest and Rocky Mountain regions — the least affected regions in Carlino and DeFina's study. The Mideast was also less affected than the national average in my replication of Carlino and DeFina's study.<sup>8</sup>

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<sup>8</sup> In Carlino and DeFina's original study, the Mideast was close to being significantly less affected than the national average, but the impulse responses were not estimated precisely enough to draw that conclusion. It is not the case that the effect of monetary policy is just stronger in those regions that are most volatile. For the alternative regions, the coefficient of variation of quarterly changes in personal income for the region most affected by monetary policy, the Great Lakes (0.57), is not very different from the coefficient of variation for the least affected region, the Energy Belt (0.55). But both are quite different from the coefficient of variation for the Plains (0.75), where the effect of monetary policy is close to the national average. Thus, having a more or less volatile economy by itself does not determine the relative impact of monetary policy on a region's economy.

**Different Responses to Monetary Policy Over Time.** The studies by Carlino and DeFina and my study estimated the differential regional effects of monetary policy from 1958 to 1992. In a recent study, Michael Owyang and Howard Wall revisited the issue and asked whether

## The estimated effects on personal income of changes in monetary policy are much weaker in every region in the Volcker-Greenspan era.

the regional effects of monetary policy may have changed over time. They estimate the effect on personal income of an unanticipated increase of one percentage point in the fed funds rate for one quarter. They looked at three different periods: the period of their full sample (1960 to 2002), the pre-Volcker period (1960 to 1978), and the Volcker-Greenspan period (1983 to 2002).<sup>9</sup>

Owyang and Wall found that the estimated effects of an unanticipated increase in the fed funds rate varied depending on which time period was used to estimate the model. For the full sample and the pre-Volcker period, personal income in each of the eight regions was negatively affected for one or more quarters and the effect was

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<sup>9</sup> See the 2004 paper by Michael Owyang and Howard Wall. In their subperiods, Owyang and Wall omit the years 1979 to 1982, a period when the Fed was using the monetary aggregates as its intermediate target to control inflation. Their model differs from the model used by Carlino and DeFina, who estimate the cumulative effect of a permanent increase in the fed funds rate. Owyang and Wall estimate the future effect of an increase in the fed funds rate that lasts only one quarter. They also include 10-year Treasury rates, the consumer price index, and a commodity price index in their model. They account for periods of high oil prices by including a separate variable equal to one in six quarters during their sample period when oil prices rose rapidly (periods of oil-price shocks). Like Carlino and DeFina, Owyang and Wall allow for direct spillovers among regions.

statistically significant. In both the full sample and the pre-Volcker period the region most affected was the Great Lakes. The Southwest and Rocky Mountains were the least affected regions in the pre-Volcker period. These were also *among* the least affected regions in the full sample.<sup>10</sup> These results

are similar to the earlier results from the studies by Carlino and DeFina and my study.

Owyang and Wall's results for the Volcker-Greenspan period differ somewhat from their results for the earlier period. The estimated effects on personal income of changes in monetary policy are much weaker in every region in the Volcker-Greenspan era.<sup>11</sup> Moreover, because the effects are not very precisely estimated, Owyang and Wall find a statistically significant decline in personal income in response to an unanticipated increase in the fed funds rate since the early 1980s only for the Great Lakes region and for only a few quarters. These results for the Volcker-Greenspan period suggest that the differential regional effects of monetary policy may have lessened in recent years.

**Identifying Specific Regional Responses to Monetary Policy.** The studies by Carlino and DeFina; my study; and Owyang and Wall's were

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<sup>10</sup> In the full sample, the Mideast was slightly less affected than the Southwest and Rocky Mountains, and New England was less affected than the Rocky Mountains.

<sup>11</sup> This corresponds to results in several other studies that economic volatility as measured by a number of variables declined significantly in the early 1980s for the nation as a whole and for individual states and regions. See Carlino's 2007 *Business Review* article.

## Alternative Definitions of Regions in the U.S.

### ORIGIN OF THE EIGHT REGIONS DEFINED BY THE BUREAU OF ECONOMIC ANALYSIS

T

he regions defined by the Bureau of Economic Analysis (BEA) had their origin in the designation of census regions and divisions. Since 1850, the Census Bureau has divided the U.S. states into regions, and since 1910, the Bureau has also defined nine smaller

groups of states, called divisions, within the regions. In the 1950s, an interagency working group in the Department of Commerce undertook a major review of the census regions and divisions. The working group's mandate was to divide the states into six to 12 regions, each consisting of two or more contiguous states. Regions were to be homogeneous with respect to certain economic and noneconomic (social) factors. The economic factors included the industrial composition of income (e.g., manufacturing, agriculture, trade, and service), the level of per capita income in 1951, and the change in per capita income from 1929 to 1951. The noneconomic factors included, among other things, population density, racial composition, education levels, telephones per 1000 people, and infant deaths per 1000 live births. Depending on which criteria were examined, several states fell into different regions, and some personal judgment had to be

made about which region a state was assigned to. While the Census Bureau did not change its definition of regions or divisions based on this review, the Bureau of Economic Analysis accepted a modified version of the working group's final recommendation to define the eight BEA regions.\* (See the Table on pages 14-15.)

### AN ALTERNATIVE DEFINITION OF REGIONS BASED ON SIMILARITIES IN STATE BUSINESS CYCLES

In a 2005 article, I argued that for business cycle analysis states should be grouped into regions based on the similarity of their business cycles. I grouped states based on the cyclical components of a new set of coincident indexes for the 50 states that incorporate changes in payroll employment, unemployment rates, average hours worked in manufacturing, and real wages and salaries. To compare this set of regions to the BEA regions, I grouped the 48 contiguous states into eight regions. I used standard cluster analysis to group the states with similar business cycles. In general, the states in the eight alternative regions were more cohesive than the states in the original BEA regions. This alternative grouping of states has many similarities with the BEA regions but also some significant differences. (See the Table on pages 14-15.)

\* One of the working group's suggestions was a division of the states into nine regions, which were different from the nine census divisions. The BEA modified this suggestion by combining the working group's Upper South region and Lower South region into one region — the Southeast.

based on similar models and arrived at similar conclusions about the regional effects of monetary policy. Michael Kouparitsas developed a somewhat different model. In his VAR, he estimates the effect of a change in monetary policy on a common unobserved component of personal income across the eight BEA regions and specific effects on personal income in each region.<sup>12</sup>

Since the common component is not observed directly, Kouparitsas must estimate changes to the common component within his model. To do

this, he chooses the Southeast region as the benchmark. He assumes that changes in the common component

<sup>12</sup> See the 2001 paper by Michael Kouparitsas. Kouparitsas makes other important assumptions that differ from Carlino and DeFina's and Owyang and Wall's. Monetary policy does not respond to regional shocks to personal income but only to shocks in the unobserved common component, and there are no direct spillovers between regions. In an earlier article (1999) Kouparitsas used eight separate models to estimate the regional effects of a change in the fed funds rate on each of the eight regional economies. The use of a different model for each region also precludes any direct spillovers between regions.

are reflected one for one in changes in personal income in the Southeast. Moreover, changes in monetary policy do not affect the Southeast directly but only through the common component. For the other seven regions a change in monetary policy can affect the region's personal income through its effect on the common component of personal income and through a specific effect on the region's income that is not due to the common component. The total effect of a change in monetary policy on a region's personal



**TABLE**

BEA Regions		Alternative Regions Based on Similarities in State Business Cycles	
Region	State	State	Region
New England	Maine	Maine	New England
	New Hampshire	New Hampshire	
	Vermont	Vermont	
	Massachusetts	Massachusetts	
	Rhode Island	Rhode Island	
	Connecticut	Connecticut	
Mideast*	New Jersey	New Jersey	Mideast*
	Pennsylvania	Pennsylvania	
	Delaware	Delaware	
	Maryland	Maryland	
Southeast	Virginia	Virginia	Southeast
	North Carolina	North Carolina	
	South Carolina	South Carolina	
	Georgia	Georgia	
	Florida	Florida	
	Kentucky	Kentucky	
	Tennessee	Tennessee	
	Alabama	Alabama	
	Mississippi	Mississippi	
	Arkansas	Arkansas	
	Louisiana		
	West Virginia		
	West Virginia		
Great Lakes	Michigan	Michigan	Great Lakes
	Ohio	Ohio	
	Indiana	Indiana	
	Illinois	Illinois	
	Wisconsin	Wisconsin	
	Minnesota		
Plains	Minnesota		Plains
	Missouri	Missouri	
	Kansas	Kansas	
	Nebraska	Nebraska	
	Iowa	Iowa	
	South Dakota		
North Dakota			

**TABLE (continued)**

BEA Regions		Alternative Regions Based on Similarities in State Business Cycles	
Region	State	State	Region
		South Dakota	Mountains/ Northern Plains
		North Dakota	
Rocky Mountain	Montana	Montana	
	Idaho	Idaho	
	Wyoming		
	Utah		
	Colorado		
		Louisiana	Energy Belt
		Wyoming	
		Utah	
		Colorado	
Southwest	Texas	Texas	
	Oklahoma	Oklahoma	
	New Mexico	New Mexico	
	Arizona		
		Arizona	West
Far West	California	California	
	Nevada	Nevada	
	Washington	Washington	
	Oregon	Oregon	

\*New York was inadvertently omitted from both the BEA region and the alternative region.

income is a combination of these two effects. Most of the regional effects of monetary policy in Kouparitsas' study come through the estimated common component of personal income. The specific regional effects are very small, and none are statistically significant, although the specific regional effect in the Southwest is close to significant. It is also important to note that changes in the common component can affect regions differently. So even *without* the specific regional impacts, changes in monetary policy can have differential regional effects on personal income.

Kouparitsas' estimates of the cumulative responses to a 1 percent in-

crease in the fed funds rate range from less than 0.4 percent to almost 0.6 percent.<sup>13</sup> Income in the Rocky Mountains, the Plains, and the Great Lakes is more strongly affected by a change in monetary policy than income in the benchmark region (Southeast).<sup>14</sup> The

<sup>13</sup> These responses include both the specific regional effects and the effects transmitted through the common component. The regional responses to a change in monetary policy are not very precisely estimated, so no region's response is statistically different from any other region's. This lack of precision may be due in part to the fact that Kouparitsas must estimate the effect of a monetary policy change on the common component and the effect of a change in the common component on each region's income.

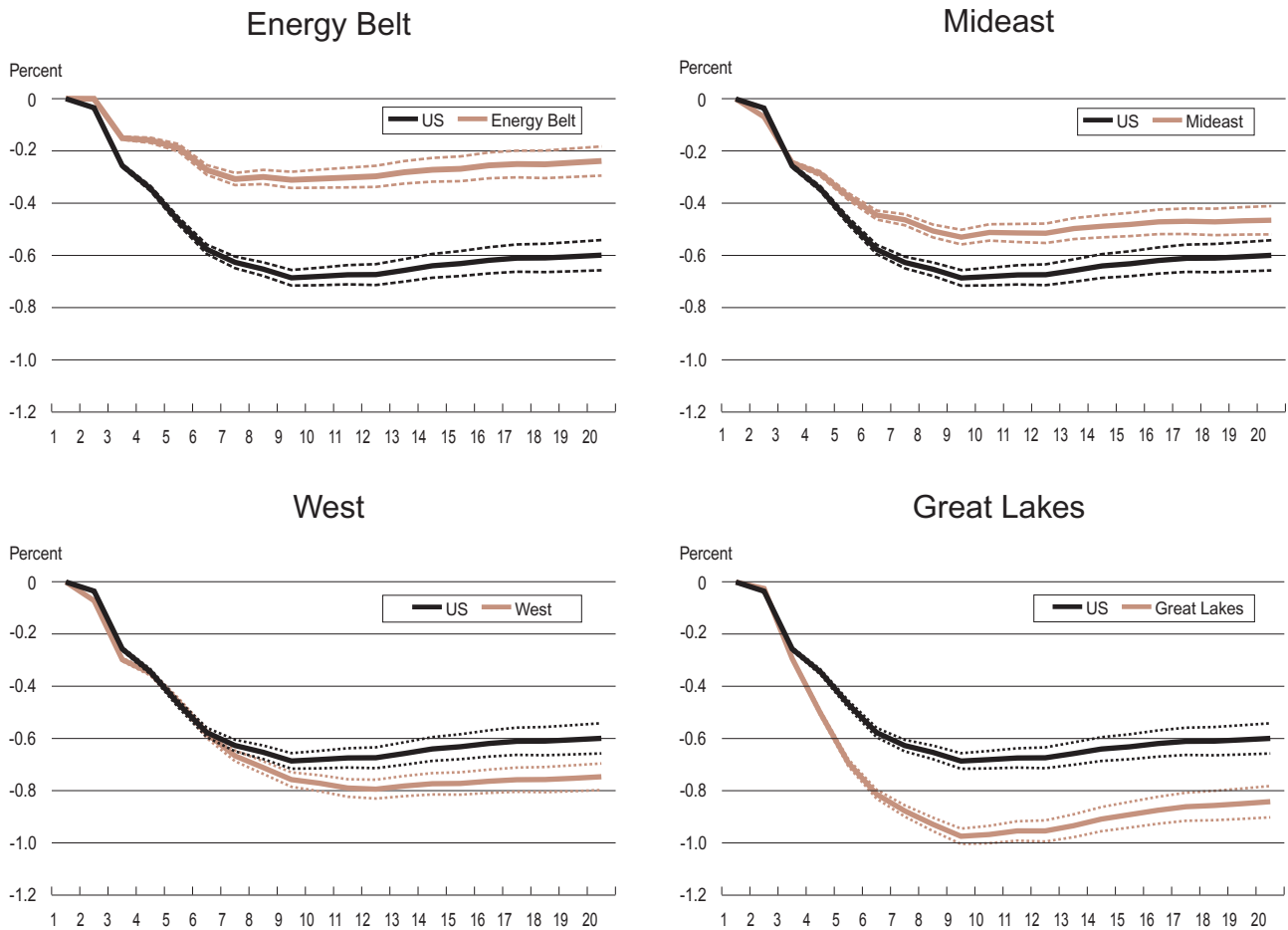
total effect of changes in monetary policy was smallest in the Southwest. Thus, in Kouparitsas' study, as in the previous ones, the Southwest stands out because of the relatively low impact of monetary policy on income in the region.

**Some Common Patterns.** Despite the differences among the four studies we have summarized, some common patterns run through them all. In all four studies the area around the Great Lakes is one of the regions most affected by shocks to monetary

<sup>14</sup> This result for the Rocky Mountains differs substantially from that of the other studies.

**FIGURE 2**

**Responses of Personal Income for the Alternative Regions**



**Note:** The solid lines represent the cumulative effect on personal income in the designated quarter resulting from a change in the federal funds rate in quarter one. The dashed lines represent the 95 percent confidence intervals for the estimated impulse responses. Based on the model, the true impulse responses have only a one in 20 chance of being outside that range.

policy. Regions with a large proportion of their economic activity derived from energy are among the least affected, whether this is the Southwest as in the traditional BEA definition of regions or the Energy Belt as I have defined it.

**EXPLAINING DIFFERENCES IN THE REGIONAL EFFECTS OF MONETARY POLICY**

VAR models with eight regions produce only eight observations of the regional effects of monetary policy, too small a sample to adequately test which

characteristics of a region determine the size of the regional response to monetary policy. The issue of the small number of observations has been addressed in two different ways. In two follow-up articles to their original paper, Carlino and DeFina estimated the effects of monetary policy at the state level from 48 *different* VARs.<sup>15</sup> The 48 different models

<sup>15</sup> See the 1999 *Journal of Regional Science* article and the 1999 *Business Review* article by Carlino and DeFina.

produce a different measure of the maximum effect of monetary policy for each state. The drawback of this approach is that each measure comes from a somewhat different system of equations. Owyang and Wall tackle the problem in a different way. They subdivide the 48 contiguous states into 19 sub-regions consisting of two to four states in a given BEA region.<sup>16</sup> They reestimate their system of equations

<sup>16</sup> The states in each sub-region must be in the same BEA region.

with these 19 sub-regions in place of the eight BEA regions. Carlino and DeFina use their state measures and Owyang and Wall use the measures from their 19 sub-regions to examine some common explanations of the transmission of monetary policy. The evidence is mixed on the importance of the various channels for regional differences in the effects of monetary policy.

**Interest-Rate-Sensitive Industries.** Some industries, such as manufacturing and construction, are highly sensitive to interest rates. Thus, we would expect regions with high concentrations of these industries to be more seriously affected by changes in monetary policy than other regions. The evidence suggests that they are. Carlino and DeFina found that the larger the share of a state's output in the manufacturing sector, the larger the declines in personal income from an unanticipated increase in the fed funds rate. Owyang and Wall got similar (but somewhat weaker) results using the share of nonfarm employment in the manufacturing sector to explain the total loss of personal income from a one-quarter increase in the fed funds rate. In their *Business Review* article on the subject, Carlino and Defina found that the effect on manufacturing was concentrated in the durable goods industries.<sup>17</sup> They also found some effects working through the construction industry. This is not surprising, given that the construction industry, like manufacturing, is sensitive to interest rates. Furthermore, Carlino and DeFina found that states with a higher concentration of output in the extractive industries (mining and drilling) were less affected than other states by unanticipated changes in monetary

<sup>17</sup> Owen Irvine and Scott Shuh document that the durable goods industries are the most interest sensitive.

policy. They had no easy explanation for this finding.

The notion that monetary policy is transmitted to the overall economy through sectors that are sensitive to interest rates has a long tradition in economics. Since the late 1980s, however, several economists have argued that monetary policy is also transmitted through a credit channel.<sup>18</sup> The credit channel should not be viewed as an alternative to the interest-rate view

## Some industries, such as manufacturing and construction, are highly sensitive to interest rates.

of how monetary policy is transmitted but rather as a reinforcement of the interest-rate effect. There are two explanations of how this credit channel works; they are often referred to as the broad credit channel and the narrow credit channel.<sup>19</sup>

**The Broad Credit Channel.** An increase in short-term interest rates can have a negative effect on the balance sheets of firms whose cash flows may decline because of higher interest payments on existing debt and whose assets may decline in value. Those firms that have better access to capital markets, e.g., by issuing their own debt, are better able to cope with these balance-sheet changes and maintain the inventory and production levels they would like. Mark Gertler and Simon Gilchrist argue that, in general, large firms have better access to capital markets than small firms because small firms tend to be younger and have less collateral and a greater degree of idiosyncratic risk.

<sup>18</sup> See, for example, the article by Ben Bernanke and Alan Blinder.

<sup>19</sup> They are also referred to as "the balance sheet channel" and "the bank lending channel." See the article by Ben Bernanke and Mark Gertler.

Based on the broad credit channel, one would expect that regions with a high percentage of small firms should be more affected by changes in monetary policy than other regions. Carlino and DeFina, however, find no evidence that the effect of monetary policy on a state's personal income is related to the percentage of small firms or the average firm size in the state. Owyang and Wall even find some weak evidence that the opposite is

true: In their full sample (1960-2002), total loss of personal income after an unanticipated increase in the fed funds rate is found to be less in sub-regions that have a higher proportion of small firms.<sup>20</sup>

### The Narrow Credit Channel.

The second explanation of a credit channel for the transmission of monetary policy focuses on the effect of monetary policy on banks' balance sheets and how they fund their loans. When the Federal Reserve raises the fed funds rate, it reduces the amount of reserves in the banking system. Since reserves must be held against bank deposits, a reduction in available reserves results in a reduction in those deposits. Therefore, banks must find other sources of funds to finance their loan portfolios, or they must reduce their supply of loans. In two articles, Anil Kashyap and Jeremy Stein argue that large banks have easier access than small banks to these other sources of funds, such as large certificates of deposits. Therefore, borrowers who depend on banks, especially small banks, for their finances will face more

<sup>20</sup> This counterintuitive result, however, is only significant at the 10 percent level.

difficulty in obtaining loans.

One would expect regions with a larger share of loans or deposits at small banks to be more seriously affected by an unanticipated rise in the fed funds rate than other regions. This does not seem to be the case, however. Neither Carlino and DeFina nor Owyang and Wall find any evidence for this explanation of the regional differences in the cumulative effects of monetary policy. In fact, both studies find some weak evidence to the contrary.<sup>21</sup> Apparently, regions and states with a large share of loans or deposits at small banks have other characteristics that offset the negative effects of reduced lending by smaller banks.

Whatever the effects of the broad and narrow credit channels in enhanc-

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<sup>21</sup> Owyang and Wall do find that in the Volcker-Greenspan period, the loss of personal income due to an increase in the fed funds rate is not as great at the trough of the downturn in regions with a larger share of deposits at the five largest banks. But the total loss of income over the cycle is not affected by the share of deposits at those banks.


ing the direct effects at the national level of an increase in interest rates, they do not seem to explain any of the regional differences in the effects of monetary policy. However, the direct interest-rate effects and the broad and narrow credit channels do not exhaust the possible ways in which monetary policy might be transmitted to the overall economy. Others have suggested that the direct effects of monetary policy can be enhanced through a change in asset prices or a change in exchange rates.<sup>22</sup> If these transmission mechanisms are important, regional differences in wealth and international trade flows might help explain regional differences in the effects of monetary policy. To date, however, no one has tested the regional effects of these channels of monetary policy. So far, differences in industry mix are the only explanation that has found consistent support in economic studies of regional differences in the effects of monetary policy.

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<sup>22</sup> See the article by Kenneth Kuttner and Patricia Mosser and the one by Peter Ireland.

## SUMMARY

Despite their differences, studies of the regional effects of unanticipated changes in monetary policy have revealed some consistent patterns. A greater than average effect and in most studies the greatest effect of monetary policy are felt in the states around the Great Lakes. The weakest effect is found in the energy-producing regions, especially in the Southwest. This knowledge alone is valuable to businesses and governments in those regions.

The hope that regional differences might help explain how monetary policy is transmitted has had only limited success. Industry mix is the only explanation for regional differences that finds support in these studies. States or regions with a high concentration of industries that are traditionally sensitive to interest rates are most affected. Any additional effect through a credit channel that may be operating at the national level is not reflected in the regional differences. 



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# International Trade: Why We Don't Have More of It

BY EDITH OSTAPIK AND KEI-MU YI

# G

lobalization has led to an enormous increase in international trade. Over the past 40 years, world exports as a share of output have doubled to almost 25 percent of world output.

However, despite this enormous increase, economic evidence suggests that significant barriers to international trade still exist. In this article, Edith Ostapik and Kei-Mu Yi summarize the latest developments in the measurement of international trade barriers.

Globalization has many facets. One of the most important is the enormous increase in international trade. Over the past 40 years, world exports as a share of output have doubled to almost 25 percent of world output.<sup>1</sup> However, despite globalization and the increasing share of output that is exported and imported internationally, economic evidence suggests that significant barriers to international trade still exist.<sup>2</sup> We will summarize the latest developments in the measurement of international trade barriers, drawing mainly from a recent comprehensive survey on the subject by James Anderson and Eric van Wincoop. In their



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survey, these authors report estimates of the magnitudes of different categories of international trade costs. They find that, on average, international trade costs almost double the price of goods in developed countries.<sup>3</sup>

The primary policy implication of the existing research is that globalization still has a long way to go, so that there is still plenty of room for trade to grow. Growth in trade will likely occur primarily through technological changes that reduce transportation or

<sup>1</sup> Source: The World Bank's World Development Indicators (we use the world export share of world GDP). Since world exports = world imports, imports have risen by the same amount.

<sup>2</sup> Previous *Business Review* articles have questioned the extent to which globalization has taken place. The article by Janet Ceglowski reviews research on barriers to international trade. Examining another dimension of globalization, Sylvain Leduc explores the lack of international diversification of investment portfolios.

<sup>3</sup> They estimate an overall average increase of 74 percent in the prices of goods in these countries.

communication costs or from long-run policy choices, such as a national currency or language. Reduction in policy-related barriers, such as tariffs, will also play a role.

## WHY AND HOW TRADE COSTS REDUCE TRADE

The core idea underlying the benefits of international trade goes back to Adam Smith and his famous pin factory parable. According to Smith, when each worker specializes in doing only those tasks he is best suited to do, a factory achieves its maximum economic efficiency. Smith and later economists extended this argument from firms to countries. Economic efficiency occurs when each country specializes in making and exporting only those goods it is relatively efficient at producing. In turn, each country imports those goods other countries produce relatively efficiently.<sup>4</sup>

<sup>4</sup> David Ricardo formalized the notion of relative efficiency in his theory of comparative advantage. One of the most powerful ideas in economics, comparative advantage shows that countries can gain from trading with each other, even if one country is more productive at producing every single good than another country. Textbooks on international economics (for example, the one by Richard Caves, Jeffrey Frankel, and Ronald Jones or the one by Paul Krugman and Maurice Obstfeld) provide a more detailed description of comparative advantage.

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In other words, international trade enhances a society's economic well-being because it facilitates specialization in production. With trade, prices consumers pay for goods are lower than those they would pay without trade. According to Smith and later economists, when trade is free and unfettered, a society maximizes its economic well-being.

Barriers to international trade prevent the efficient outcome described above from occurring. For example, because these barriers raise the costs of purchasing imported goods, U.S. consumers would buy fewer foreign goods, and foreign consumers would buy fewer U.S. goods. To satisfy the demand for products that previously had been imported under free trade, each country would now be making more goods it is not relatively efficient at producing. In the presence of international trade barriers, there would be less specialization, prices would be higher, and, overall, consumers in all countries would be worse off.

## THE TWO MAIN TYPES OF TRADE COSTS

In 19<sup>th</sup>-century England, economist David Ricardo used these core ideas of the benefits to international trade to argue against a pressing political barrier to trade: the Corn Laws, which protected British agriculture and kept domestic food prices high. Since then, economists have studied many other barriers to trade. We will describe these barriers in terms of costs, following the convention used by Anderson and van Wincoop.<sup>5</sup>

Broadly, trade costs are all costs incurred from the time a good leaves

<sup>5</sup> Anderson and van Wincoop divide trade costs into three broad categories: border-related costs, international transportation costs, and distribution costs. We focus only on those costs associated with international trade: border-related costs and international transport costs.

the factory or its place of production to the time it is purchased by the end-user. Such costs can be incurred internationally (for example, at the border) or domestically (that is, within a country). In the case of consumer goods such as automobiles, televisions, clothing, and food, trade costs are the difference between the price at the “factory gate” and the retail price.<sup>6</sup>

International trade costs can be broadly divided into two main categories:

## International trade enhances a society's economic well-being because it facilitates specialization in production.

border-related costs and international transportation costs. Border-related costs encompass the broad range of trade barriers encountered between nations, excluding international transportation. These barriers include costs that occur specifically at the border, such as tariffs, quotas, and paperwork due to customs and other regulations, as well as those differences between countries that could affect trade, such as different currencies, languages, or laws (contract enforcement).<sup>7</sup> Together with international transport costs, these items make up the costs incurred internationally.

Border-related costs can be

<sup>6</sup> In the case of intermediate goods such as automobile engines, semiconductors, textiles, and wheat, trade costs are the difference between the “factory gate” price and the purchase price by the next firm in the production sequence.

<sup>7</sup> Economists have studied the importance of international networks in reducing the negative effect of these country-level differences on trade. For example, James Rauch and Vitor Trindade find that trade flows are greater between countries with larger shares of Chinese population. They hypothesize that this linguistic and cultural network facilitates trade by reducing information and contract enforcement costs otherwise present between pairs of countries.

classified based on whether they are attributable to (national) government policies. This allows economists to assess the importance of border costs imposed by government policy relative to other border costs. Border-related costs imposed by government policy are further separated by economists into two categories: tariffs and nontariff barriers.

Tariffs are additional charges added to the price of a good imported

from another country. The charge is usually levied as a proportion of the price, similar to a sales tax. Nontariff barriers<sup>8</sup> are loosely defined as all other trade barriers imposed by national governments. The most familiar of these are quotas, which are restrictions on the quantity of a good that can be imported from a country. They also include voluntary export restraints, which occur when the exporting country “voluntarily” agrees to limit its exports to the importing country; anti-dumping actions, which are taken when foreign firms are suspected of selling their goods at a price below that in their home market;<sup>9</sup> paperwork and regulatory procedures encountered

<sup>8</sup> The main data source for tariffs and nontariff barriers is the United Nations' Conference on Trade and Development TRAINS database. This database lists eight broad categories of trade control measures, which can be further broken down into 150 sub-categories.

<sup>9</sup> Dumping occurs when exports are sold in foreign markets at a price below their domestic price or production costs (according to U.S. policy). An anti-dumping action is the filing, by a domestic firm or industry, of an accusation that a foreign firm or industry has dumped goods in the domestic market. If the foreign firms are found guilty of dumping, the domestic government levies a duty on the goods in question for a fixed period of time.

specifically at the national border; and “softer” measures, such as product labeling and product quality standards.

Border barriers not due to government policy include information costs (costs incurred by potential importers in finding out more about the goods they are buying); costs due to exchange rate uncertainty, linguistic barriers, or other cultural differences; and contract enforcement costs. International transportation costs are freight charges and transport time associated with moving goods from the exporting to the importing country. These costs include all freight and time costs associated with moving a good from the factory in the exporting country to the first port of entry in the importing country. Freight charges include trucking, shipping, and air charges.

### MEASURING TRADE COSTS

We can measure trade costs two ways. The first is to simply measure them directly from concrete data. The second involves an indirect approach whereby the costs are inferred using an economic model of bilateral trade flows known as the gravity model.

**Border-Related Costs.** Tariffs are the easiest to measure because they are directly collected by U.S. Customs officials. Detailed data are collected on tariff rates for thousands of goods. There are two approaches to combining the detailed tariff data into an overall average tariff measure for the country. One approach is to compute an average across all tariff rates. While this way is simple to implement, it is problematic because it weighs all goods equally, regardless of whether imports of the good are \$10,000 or \$10 billion.

A second approach is to weigh the tariff rates according to the volume of imports. In the above example, the tariff on the heavily imported

good would have a weight 1 million times larger than the weight on the other good. However, this approach is problematic, as well. Suppose that tariff rates on Canadian apples were so high that U.S. consumers did not import them at all. Clearly, the tariffs on apples are negatively affecting imports.<sup>10</sup> But precisely because their impact is so negative that imports fall to zero, they would have a zero weight. In other words, this approach tends

**In its simplest form, the gravity model is a statistical relationship that seeks to explain trade between two countries (bilateral trade) by three forces: the economic sizes of the two countries and the distance between them.**

to underestimate the true impact of tariffs. Despite this shortcoming, most calculations of overall average tariff rates employ this second approach.

Calculating other border-related trade costs, especially nontariff trade barriers, is considerably more difficult. In his study, Patrick Messerlin converts the nontariff barriers into a tariff equivalent.<sup>11</sup> For quotas, Messerlin uses direct information from case studies to do the conversion. For the anti-dumping measures, he either directly converts them to tariff-equivalents<sup>12</sup> or uses the ratio of the “dumping” price

<sup>10</sup> The following historical example illustrates the effect of a tariff on the volume of imports. In April 1984, the U.S. government increased the tariff rate on heavyweight motorcycles from 4.4 to 45 percent. From 1983 to 1984, the total customs value (the value at the “entry gate” of a country) of heavyweight motorcycle imports (700-790 cubic centimeters of engine displacement) fell from \$5.7 million to \$55,000.

<sup>11</sup> In their survey, Anderson and van Wincoop cite Messerlin’s article.

<sup>12</sup> Ad valorem duties, which are taxes levied as a percentage of the value of the imported goods, are converted directly.

to the standard world price to convert the measures to tax equivalents. These different measures are summed to an overall tariff equivalent and then combined with the average tariff rate to yield an estimate of border-related trade costs imposed by government policy.

For border-related trade costs not related to government policy, economists generally rely on a combination of direct and indirect measurement

based on the gravity model. For example, the costs of not sharing a common currency or a common language, as well as security costs and information costs, are calculated using the gravity model.

In its simplest form, the gravity model is a statistical relationship that seeks to explain trade between two countries (bilateral trade) by three forces: the economic sizes of the two countries and the distance between them. Economists perform a statistical analysis called a regression in order to obtain an estimate, for example, of the effect of an increase in distance on trade flows.

More sophisticated versions of the gravity model include additional variables to further explain bilateral trade flows. In our context, the additional variables capture whether the two countries share a common currency, language, border, trade agreement, or legal system. While the lack of a common currency, for example, will not show up as a direct add-on to the price of the imported good as does a tariff, it will still reduce trade. The gravity



regression provides a statistical means for measuring the tariff-equivalent of this reduction in trade.<sup>13</sup>

**International Transport Costs.**

The four primary modes of transport are boat, rail, truck, and airplane. The two key transport costs are direct freight, or shipping, costs and travel time. Exporters must decide on the most efficient mode (or combination of modes) of transport for their goods, balancing per unit shipping costs and travel time. In general, transport by air is more expensive in terms of freight costs but cheaper in terms of time. In addition, countries with poorly developed infrastructure (for example, roads, airports, and ports) will generally have higher freight costs compared with countries that have large stocks of infrastructure.

Anderson and van Wincoop explore research on measuring freight costs, where shippers and handlers are interviewed, industry trade journals are examined, and customs data are analyzed. Customs data provide both total imports including freight charges and total imports excluding freight charges. These customs data facilitate the calculation of total freight charges associated with importing.<sup>14</sup>

Anderson and van Wincoop ulti-

<sup>13</sup> The tariff-equivalent of the effect of not having a common currency could be calculated if the gravity regression includes both tariff rates and a variable for whether or not the two countries share a common currency. Then, the regression would indicate how much a one-percentage-point change in tariffs reduces trade, and it would also indicate how much not sharing a common currency would reduce trade. From these two pieces of information, the tariff-equivalent of not sharing a common currency can be calculated.

<sup>14</sup> From these two measures it is possible to calculate the average free on board (f.o.b.) price (the price on the mode of transport before any trade costs) as well as the average cost, insurance, and freight (c.i.f.) price. The difference between these two numbers is one way of measuring transport costs.

mately draw from an article by David Hummels for a measure of international transport costs because he incorporates time into transportation costs.<sup>15</sup> In his article, Hummels develops methodologies to translate time costs into dollars, from which the costs can then be expressed as a percentage of the value of the good transported. Then, the freight costs and the time costs can be totaled to yield an overall measure of international transport costs.

**ESTIMATES OF TRADE COSTS**

Before beginning the discussion of estimating trade costs, we advise the reader to review the table and figure.

<sup>15</sup> See the 2001a article by Hummels.

The table contains a breakdown of the two main international trade costs and their components. The figure illustrates the importance of tariffs and other border-related costs, on the one hand, and international transport costs, on the other hand, via a hypothetical example of a pair of shoes produced in a foreign country and shipped to the U.S.

**Tariffs.** To arrive at a single overall tariff measure for a country, economists typically calculate average tariffs according to the trade-weighted method discussed above. Average tariffs can differ across countries for a number of reasons, but the most obvious and basic reason is that tariff rates on individual goods are higher in one country than in another.<sup>16</sup> Anderson

**TABLE**

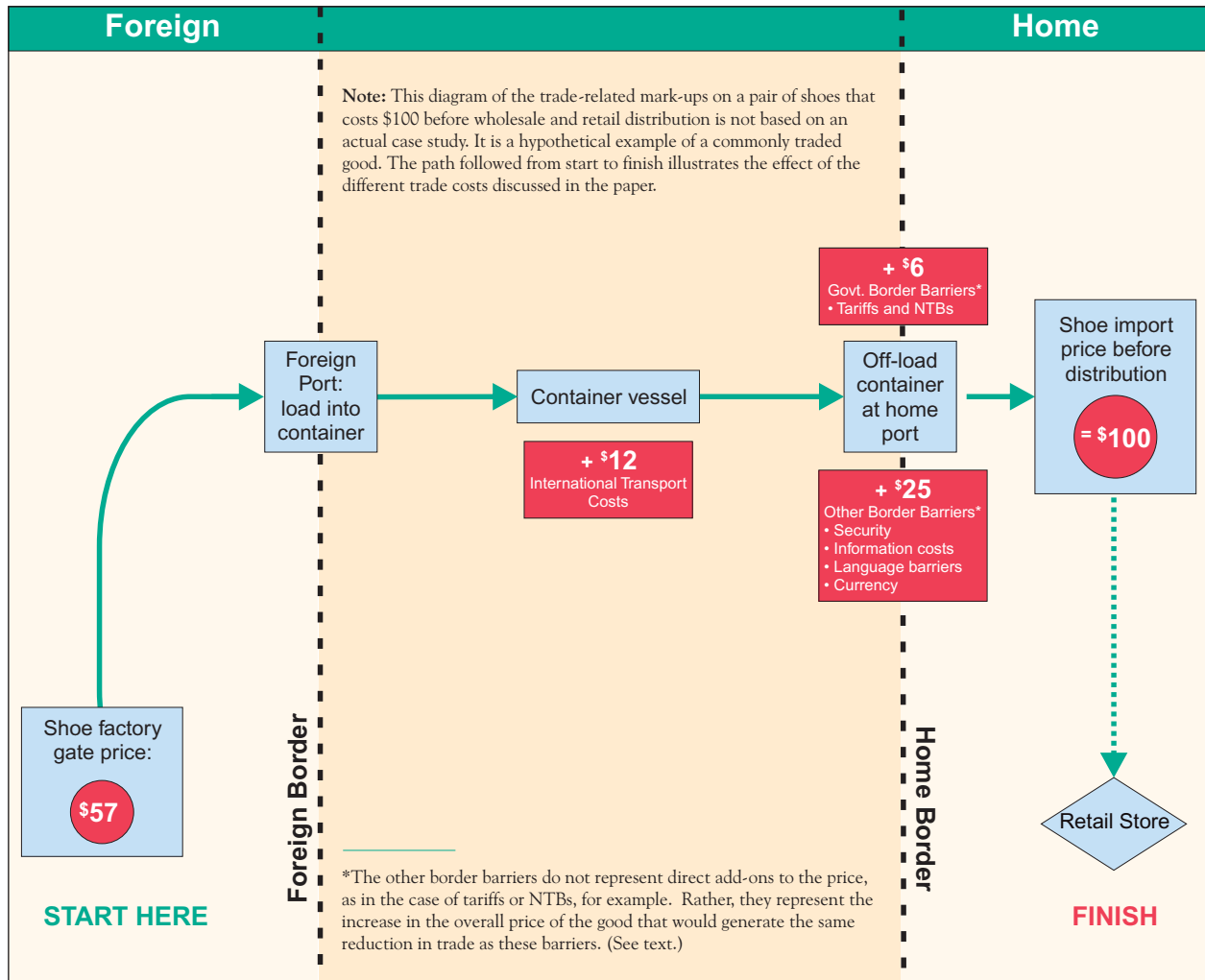
**A Breakdown of Trade Costs\***

Description	Percent Markup over the Price of the Good
time costs	9
+ shipping costs	11
<b>Total Transport Costs</b>	<b>21</b>
tariffs and NTBs	8
language costs	7
currency costs	14
information costs	6
+ security costs	3
<b>Total Border-Related Barriers</b>	<b>44%</b>
<b>TOTAL</b>	<b>74%</b>

\* The table presents the various trade costs described in this paper, along with categorical sub-totals and the final total. In totaling these components of the overall trade cost, recall the multiplicative accounting procedure employed by Anderson and van Wincoop, described in detail on page 25.



**FIGURE**



and van Wincoop report that in 1999, this trade-weighted average tariff rate ranged from 0 to 30 percent across different countries. They find that

<sup>16</sup> Another reason would be if a country happens to heavily import those goods that face high tariff rates. This would be unusual, however, because high tariff rates presumably discourage imports.

developed countries' tariffs tended to be considerably lower than tariffs in developing countries: Developing countries tend to have tariffs of more than 10 percent, while developed countries' tariffs are in the range of 0 to 5 percent.

While average tariffs in developed countries are low, there is some variation between countries, as the

following numbers from Anderson and van Wincoop indicate. At the low end in 1999, Switzerland, Hong Kong, and Singapore had 0 percent tariffs. At the high end, Australia and Canada had average tariffs of about 4.5 percent. In between were New Zealand and the major advanced economies, including Japan, the United States, and the European Union (EU), which had

average tariffs of about 2 to 3 percent.

**Nontariff Barriers.** Traditionally, the tendency has been to apply nontariff barriers broadly to goods in a few sectors, as Anderson and van Wincoop show using United Nations data.<sup>17</sup> For example, nontariff barriers in 1999 were applied, respectively, to 74 percent, 71 percent, and 39 percent of the categories of goods in the food, textiles, and wood-related sectors.<sup>18</sup> This contrasts with the overall picture of nontariff barrier coverage in 1999, where only 1.5 percent of all goods were protected by such barriers. Additionally, there has been a rise in other types of nontariff barriers, most notably anti-dumping actions. If these anti-dumping actions were included in the nontariff barriers, the share of all goods protected increases to 27.2 percent in 1999.<sup>19</sup>

Incorporating all of these types of trade policy barriers into models, researchers have found that for the EU in 1999, tariffs and nontariff barriers can be translated into a 7.7 percent “tax” on industrial goods. In light of the tariff numbers presented above, this estimate indicates that for the EU, at least, nontariff barriers exert more of a tax than do tariffs.

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<sup>17</sup> United Nations Conference on Trade and Development’s Trade Analysis & Information System: TRAINS, and general insight from the work of Jon Haveman available at: [www.maclester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeConcordances.html](http://www.maclester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeConcordances.html).

<sup>18</sup> In 2005 the World Trade Organization’s textile quota system known as the Multi-Fiber Agreement (MFA) was phased out. However, subsequent dramatic changes in trade flows have caused countries to invoke other methods to control the amount of textiles traded.

<sup>19</sup> All percentages reported are simple averages of the nontariff barrier coverage ratios over the appropriate categories of goods (that is, the share of total goods in a category that are subjected to nontariff barriers).

### Other Border-Related Barriers.

Using the gravity model described above, a number of researchers have been able to estimate, for developed countries, the indirect trade costs at national borders. Anderson and van Wincoop summarize the main findings as follows: (1) The costs of not sharing the same language are roughly 7 percent of the value of the goods

**Barriers to international trade impede the free flow of goods and services, leading to increased production by relatively inefficient firms, thereby reducing the overall economic well-being of societies.**

traded. (2) The cost of employing different currencies is about 14 percent. (3) Information costs are 6 percent. (4) Security costs are 3 percent.

Overall, these nonpolicy border-related costs equal 33 percent. Note that the combined effect is not obtained by simply adding up each border cost. Rather, because each border cost is applied to the total value of trade inclusive of all other border costs, a multiplicative formula must be used:  $(1.07) \times (1.14) \times (1.06) \times (1.03) - 1 = 0.33$  (or 33 percent).<sup>20</sup> Adding government

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<sup>20</sup> When border costs are small, the multiplicative formula yields numbers very similar to what would be obtained by adding up the costs. However, when border costs are large, the formula yields numbers quite different from those obtained by simple addition.

policy barriers to these barriers yields a total border-related trade cost of  $(1.33) \times (1.077) - 1 = 0.44$  (or 44 percent).

**International Transport Costs.** Anderson and van Wincoop report results on transport costs from another article by David Hummels.<sup>21</sup> Using U.S. national customs data to get detailed data on transport costs and then calculating a simple average across all of the costs, Hummels obtains a freight transport cost estimate of 10.7 percent.

Anderson and van Wincoop also report results from Hummels on-time costs.<sup>22</sup> As of 1998, about half the value of U.S. exports are shipped by air. Hummels imputes a willingness to pay for saved time and translates that into a percentage of the value of the goods shipped. His estimate of U.S. time costs is 9 percent.<sup>23</sup> Combining the freight costs and the time cost estimates yields a total transport cost of  $(1.107 \times 1.09) - 1 = 0.21$ , or 21 percent of the price of the good at the factory gate.

To summarize, Anderson and van Wincoop list two main sources of trade costs: border barriers and international transport costs. They then draw on the existing empirical research to obtain a rough approximation of each of these costs for the United States, as well as an approximation of the overall costs. All border barriers, including tariffs, nontariff barriers, and nonpolicy barriers, add up to a 44 percent “tax” on imports. Transportation costs are an additional 21 percent. Combining these costs — again using the multiplicative formula — yields the final overall tax-equivalent international trade cost of 74 percent of the factory gate price.

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<sup>21</sup> See Hummels’ 2001b article.

<sup>22</sup> See Hummels’ 2001a article.

<sup>23</sup> This is a sharp decrease from 32 percent in 1950.

## CONCLUSION


Barriers to international trade impede the free flow of goods and services, leading to increased production by relatively inefficient firms, thereby reducing the overall economic well-being of societies. While the globalization of the world's economies has seized the attention of policymakers, the media, and economists, researchers have recently collected a great deal of evidence that indicates that barriers to trade remain quite high. The types and magnitudes of these barriers in developed countries are highlighted in an important recent article by James Anderson and Eric van Wincoop.

Combining the results from current research on trade costs, Anderson and van Wincoop find that border barriers and international transport costs are equivalent to a 74 percent tax on the factory gate price — 74 percent seems like a high number; imagine a sales tax that high! How is it that in a rapidly globalizing world the costs of international trade are still so high? For evidence of these high trade costs, it is useful to look at the United States

data in relation to the predictions of theories of international trade.

The United States is the world's largest economy, yet its output is still less than one-third of the world total. If there were no costs to international trade — if it were as costless to ship goods to Europe and China as it is to send an e-mail — most existing trade theories would predict that the United States would export about two-thirds of its output. In fact, exports are only about 10 percent of U.S. GDP. From the sharp divergence of the theory's prediction and the actual data, we can infer that costs to international trade are quite high.

Anderson and van Wincoop's article shows that nonpolicy barriers account for the vast majority of total trade costs. Policy barriers, such as tariffs and quotas, play a smaller role. Will these nonpolicy and policy barriers ever be completely eliminated? The answer certainly is no. It is not possible that the economists' idealized world of frictionless trade in which trade costs and barriers are zero will ever be realized.

For the world's developed economies, however, significant reductions in trade costs and increases in trade can come from technological improvements that reduce international transportation costs, or from long-run policy changes, such as policies to reduce currency and information costs (or language and cultural barriers). One example is the recent adoption of a single currency, the euro, by 12 nations within Europe in 1999.<sup>24</sup> In addition, Anderson and van Wincoop show that for certain categories of goods, policy barriers have been strongly persistent over time. If these barriers were to be reduced significantly or eliminated, this would further increase international trade. Regardless of which barriers fall, firms and consumers, on the whole, would be better off. 

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<sup>24</sup> Between 2000 and 2005, euro-area trade increased by 10.3 percent, which was larger than the increase between 1993 and 1998 (8.3 percent). This is consistent with (but not proof of) the notion that the adoption of the euro reduced trade costs, thus increasing trade.

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# Economic Growth and Development: Perspectives for Policymakers

## A Summary of the 2006 Philadelphia Fed Policy Forum

BY LORETTA J. MESTER

“Economic Growth and Development: Perspectives for Policymakers” was the topic of our sixth annual Philadelphia Fed Policy Forum held on December 1, 2006. This event, sponsored by the Bank’s Research Department, brought together economic scholars, policymakers, and market economists to discuss and debate the drivers of economic development worldwide and the effectiveness of policies to improve growth and reduce poverty. Our hope is that the 2006 Policy Forum will serve as a catalyst for both greater understanding of and further research on the important topic of international economic development.

Most economists agree that economic growth is the driver of a country’s standard of living. But what drives economic growth? What programs and policies are effective at promoting economic development and the reduction of poverty and how is effectiveness best determined? Have there been unforeseen consequences of policies that we need to bear in mind when designing new programs? These were some of the questions addressed in the 2006 Policy Forum.



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[www.philadelphiafed.org/econ/br/index.html](http://www.philadelphiafed.org/econ/br/index.html).

**Charles Plosser**, president of the Federal Reserve Bank of Philadelphia, provided opening remarks. He pointed out that while the developed world has spent trillions of dollars promoting development around the world, the track record has not been entirely positive. In his view, it is important that we recognize and learn from past mistakes, and this means taking a step back to look at the long-run economic impacts of different types of programs. It also means tackling challenging and sometimes controversial issues like corruption, foreign aid, and trade. These were among the topics addressed the rest of the day.

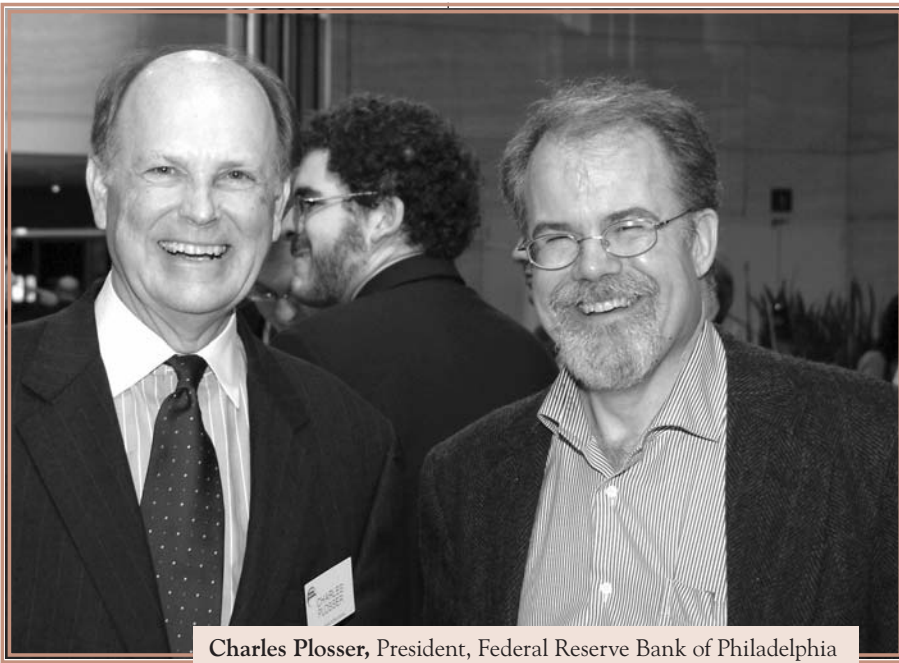
### ECONOMIC GROWTH AND DEVELOPMENT: AN OVERVIEW OF ISSUES AND EVIDENCE<sup>1</sup>

**Roberto Zaghera**, of the World Bank, began the first session with an

overview of a World Bank study on development lessons from the 1990s and their implications.<sup>2</sup> In the late 1980s and early 1990s, the World Bank had a sense that to spur economic growth, all governments need do is implement the so-called Washington consensus of financial and trade liberalization, macroeconomic stability, and privatization. However, as the 1990s unfolded, the effectiveness of these policies began to be questioned as countries thought to have improved their policies still suffered from low growth rates. Indeed, although policies improved in the 1980s and 1990s, growth performance was lower than in the 1960s and 1970s. There appeared to be no set formula for success. China and India, which remained relatively closed economies with large public sectors, grew much faster than countries like Brazil, Argentina, and Chile, which had liberalized much faster. The length and depth of the recession in Russia and other countries of the former Soviet Union surprised many, given the improvement in the economic policy regime. Several countries, including those in East Asia, Brazil, and Argentina, experienced financial crises. It appeared that improvements in policy did not necessarily lead to improvements in economic performance, leading the World Bank to conclude that growth

<sup>1</sup> Many of the presentations reviewed here and background papers are available on our website at [www.philadelphiafed.org/econ/conf/forum2006/program.html](http://www.philadelphiafed.org/econ/conf/forum2006/program.html).

<sup>2</sup> The World Bank, *Economic Growth in the 1990s: Learning from a Decade of Reform* (The World Bank, April 2005).



Charles Plosser, President, Federal Reserve Bank of Philadelphia  
William Easterly, New York University

processes are much more complex than it had earlier thought. In addition, since the models underlying certain economic systems are unknown, the response functions to certain policy actions were not necessarily what one expected. The World Bank concluded that there typically needs to be a lot of learning by doing and experimentation until effective policies are implemented.

The World Bank's systematic study of the 1990s combined information from empirical analyses and from practitioners in the field. The study suggests that institutions and history matter and that no two successful outcomes are necessarily alike. Among the study's many lessons is that *how* macroeconomic stability is achieved is as important as stability itself. As Zaghera pointed out, when fiscal deficits are reduced by curtailing investment in infrastructure, there is a clear tradeoff between stability achieved in the short run and long-term economic growth. Another lesson is that trade reforms are not

a panacea. They typically require complementary reforms, e.g., exchange rate policies and trade logistics, to be effective, and the gains from trade reforms are not necessarily shared with the poor – income inequality remains an issue. This lesson was also emphasized later in the day by speakers Dani Rodrik and Ann Harrison. A third lesson is that policies should not merely focus on achieving the efficient use of resources (a static concept) but also on expanding productive capacity (a dynamic concept). Based on the study's revelation of the complexity of the issues surrounding effective growth policies, the World Bank in partnership with other international agencies and private foundations has established an independent commission on growth and development, chaired by Nobel laureate Michael Spence. Zaghera explained that the commission brings together top academic researchers and practitioners, so that the best empirical and analytical thinking on economic growth and development can be

coupled with experience in the field to inform policymaking.

**Xavier Sala-i-Martin**, of Columbia University, continued the discussion, focusing on the consequences of economic growth for the distribution of income, in particular, the level of poverty, i.e., the percentage of people below a certain income threshold, and the degree of income inequality, i.e., dispersion in income levels. Sala-i-Martin pointed out that the national income data for countries indicate that growth of per capita income worldwide has been increasing for the last two centuries and accelerating since 1970, while it has also diverged across countries. The economies of poor countries have tended to grow slower than those of rich countries, so-called  $\beta$ -divergence. In addition, measures of cross-country income dispersion, e.g., the variance of log income, have been rising, so-called  $\sigma$ -divergence. But these results are based on country-level income data and not on the income levels of individuals – they essentially treat every country as a single observation and thus give a low weight to individuals in high-population countries like China, compared to those in low-population countries like Lesotho. The country-level distribution has little to say about the welfare of individuals. Weighting country-level per capita income by population goes part of the way toward uncovering the worldwide income distribution of individuals but not all the way, since it still assumes that everyone within a country earns the same level of income. Unfortunately, individual-level income data are not available in the national income accounts of countries. Sala-i-Martin explained his method of constructing the distribution of income across individuals for each country. He sets the mean of the distribution for each country at its per capita income level as calculated from the country's national

income accounts data and then he derives a measure of dispersion around this mean based on survey data on individuals collected from a variety of sources. These calculations involve a number of approximations. From there, individual-level income distributions can be calculated based on parametric or nonparametric methods, which yield similar results.<sup>3</sup>

In China, income inequality across individuals has increased greatly over the past three decades: The rich are getting richer at a much faster pace than the incomes of the poor are rising. But the number of people below the poverty line – which the World Bank defines at about \$1 per day – has also declined very quickly. In other countries, while economic growth has shifted the income distribution to the right, it is less clear how income dispersion has changed over time. In India, the level of dispersion hasn't changed; in the U.S., income inequality has risen. Many countries in Africa, including Nigeria, the most populated country in Africa, have experienced negative growth, so their income distributions have shifted to the left and there has been an explosion in poverty levels. At the same time, the right-hand side of the distribution is moving to the right – higher income individuals are getting richer. Sala-i-Martin suggests that these people, who tend to have the political power, may have less incentive to implement any reforms.

When the income distributions across individuals for each country are aggregated into a distribution for the world, one finds that conclusions about changes in the level of poverty and income inequality are quite differ-

ent from the ones based on the world distribution of per capita income across countries. Sala-i-Martin finds that between 1970 and 2000, the percentage of people living in poverty has fallen (from about 15 percent to 6 percent, using the \$1 per day definition of the poverty level). And the number, rather than the percentage, of people in the world living in poverty has declined since 1978. This decline in poverty has been seen in each region of the world except Africa. In 1970, three-quarters of the world's poor were in Asia; today, the majority of the poor are in Africa.

The distribution of income across individuals in the world indicates that inequality across individuals has actually fallen since the 1970s. This has occurred even though within countries, income inequality across individuals has risen and per capita income across countries has diverged. This seeming contradiction is reconciled by recognizing that global inequality is the sum of within-country inequality and cross-country inequality, which is not the inequality in per capita income across countries but the inequality across individuals that would exist in the world if all citizens within each country had the same level of income but there were different per capita levels of income across countries. This cross-country inequality has fallen (and more than enough to offset the rise in within-country inequality) because the incomes of poor people in Asia have risen at

a faster rate than the incomes of rich people in the OECD countries, and these poor constitute a large population. Once the incomes of these poor people catch up, Sala-i-Martin expects inequality to resume increasing, unless economic growth in Africa picks up and raises the income of the poor in those countries. Indeed, his results show that cross-country inequality explains more of the inequality across individuals than within-country inequality, suggesting that aggregate economic growth in poor countries would be not only the way to reduce poverty but also the way to reduce inequality across individuals.

#### POLICY RESPONSES: TRADE AND FOREIGN CREDIT

Our second session turned to two policy initiatives: trade and foreign credit. **Elhanan Helpman**, of Harvard University, outlined some of the advances that have been made in understanding how production is organized across countries, including



**Elhanan Helpman**, Harvard University  
**Roberto Zaghera**, The World Bank

<sup>3</sup> See Xavier Sala-i-Martin, "The World Distribution of Income: Falling Poverty and ...Convergence, Period," *Quarterly Journal of Economics* (May 2006), pp. 351-97.

recent research on international trade and foreign direct investment.<sup>4</sup> Globalization has led to new patterns of world specialization. Traditional explanations of international trade emphasized differences across countries in technology and factor endowments. In the 1980s, economists enhanced their explanations based on scale economies in production and monopolistic competition, which helped explain why a lot of trade takes place among countries that are more similar than different, something that could not be explained by earlier theories. In the last few years, elements of within-industry heterogeneity, the global sourcing strategies of firms, and the importance of institutions have been incorporated into the theory. Traditionally, foreign direct investment has been classified into two types: horizontal and vertical. Horizontal foreign direct investment involves firms' building a plant in a foreign country to produce products to sell in that market. Vertical foreign direct investment involves firms' investing in low-cost countries to produce intermediate inputs that are not necessarily used in products sold to the host country. But the integration strategies of multinational corporations have become more complex, requiring a more complex theory to explain the observed global sourcing strategies of firms.

As Helpman explained, the international organization of production can be described along two dimensions. The industry can vertically integrate all of its production in a single entity or it can outsource some of its production. It can locate its production activities (and its outsourced activities) at home or abroad. Industries

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<sup>4</sup>For further discussion, see Elhanan Helpman, "Trade, FDI, and the Organization of Firms," *Journal of Economic Literature*, 44 (September 2006), pp. 589-630.

that choose to be vertically integrated in a foreign country are essentially engaging in foreign direct investment. Thus, there will be inter-industry differences in foreign direct investment levels. The theory also suggests that there will be intra-industry differences. High-productivity firms tend to be the exporters because they are the firms that can cover the fixed costs of operating in foreign markets.

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This analysis suggests that trade liberalization will have important effects not only across industries but within industries. In particular, opening trade pushes the low-productivity firms out of the industry and reallocates production to the high-productivity firms. As a result, it raises the average productivity of the industries involved. The theory suggests that trade liberalization will also affect domestic firms' rate of technology adoption and that the choice of whether to export or to engage in foreign direct investment depends not only on the average productivity in the industry but also on how productivity is distributed across firms. As Helpman explained, this means one cannot think about different sources of comparative advantage independently from one another. For example, comparative advantage that comes from endowments will induce different productivity levels in different industries, which is another source of comparative advantage. Financial institutions, the quality of the legal system in enforcing contracts, and labor market institutions (such as hiring and firing costs) are other

sources of comparative advantage. Studies have shown that each of these has a distinct and important impact on the structure of trade, comparable in size to other determinants of trade flows, such as tariffs. Helpman concludes that the advances in the theory of trade suggest that it can no longer be viewed as merely a sectoral adjustment; rather, it has important implications for the patterns of productivity

within and across industries and, therefore, for economic growth.

**William Easterly**, of New York University, drew on his recently published book to discuss the impact of foreign aid on world poverty.<sup>5</sup> Although many policymakers and institutions over many years have called for a "big push" of foreign aid to rid the world poverty, Easterly is highly skeptical of this planners' approach. First, there is no evidence that poor countries are in a so-called poverty trap. The poorest countries are no more likely than others to have zero per capita growth or to have growth levels that would make them fall further behind the richest countries in terms of income. Moreover, there is no evidence that foreign aid raises growth to escape a poverty trap, even if one existed. Foreign aid has increased significantly, especially in the last decade, but poverty remains. Empirical studies,

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<sup>5</sup>William Easterly, *The White Man's Burden: Why the West's Efforts to Aid the Rest Have Done So Much Ill and So Little Good* (Penguin Group [USA], March 2006).



which have used sophisticated econometrics to deal with issues of adverse selection and reverse causality, have concluded that foreign aid has not increased economic growth rates. The quarter of countries with the highest average aid over the last 42 years (which accounted for about 16 percent of world GDP each year) have had per capita income growth of only about 0.4 percent per year. Africa has received \$568 billion (in today's dollars) in aid over the last 42 years and zero rise in living standards.

One difficulty with the planners' approach to end world poverty is that it typically has poorly designed incentives. Many different agencies are involved, and they are all collectively responsible for the plan to end world poverty. Also, they are trying to achieve multiple goals. Easterly pointed out that the United Nations millennium development goals include 54 different targets for reducing poverty by 2015. This design creates free rider and collective action problems, where ultimate responsibility is not effectively assigned and it is difficult to hold any individual accountable for any one result.

Easterly believes a more promising approach is one he calls the searchers' approach to foreign aid. He believes foreign aid could do a lot more if it concentrated on specific, less grandiose outcomes – marginal steps that help individuals rather than plans to achieve overall growth or development. These steps would be found by “searchers,” analogous to entrepreneurs in private markets. Examples include micro-credit programs, for which Mohammad Yunus, the founder of Grameen Bank, won the Nobel Peace Prize in 2006, or the Progres-Oportunidades program, an incentive-based health, nutrition, and education program for the poor in Mexico, designed by Santiago Levy. While these types of programs are

too small to achieve overall development, they confer real benefits to poor people, and in Easterly's view, that's all one should ask of foreign aid. Also, advances in development economics, such as systematic randomized controlled trials, have made the evaluation of which programs work and which don't work more reliable, which has made it easier to determine where aid can be effective.

Easterly ended his presentation with two principles for solving the foreign aid problem. First, when something doesn't work, discontinue it, and when something does work, do more of it. Although this principle seems obvious, Easterly says it is being violated repeatedly in foreign aid programs.

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Second, to induce the right incentives, individual aid programs should be independently evaluated, and pragmatic searchers who find things that work should be rewarded. This could go a long way to help ensuring that aid finally does reach the world's poor.

#### **FINANCIAL MARKETS AND GROWTH**

The afternoon sessions addressed how financial markets, financial institutions, and other institutions can either help or hinder growth, poverty, and inequality of income. The first of these two sessions examined the role of financial systems in economic development. **Jeffrey Lacker**, president of the Federal Reserve Bank of Richmond, discussed one aspect of financial system design, namely, the role of regulation in financial markets that

are innovating and the contributions innovations can make to economic growth and well being. He focused on those innovations that have been particularly striking in the U.S. over the last few decades, in the belief that the U.S. experience would be relevant to policymakers in the developing world.

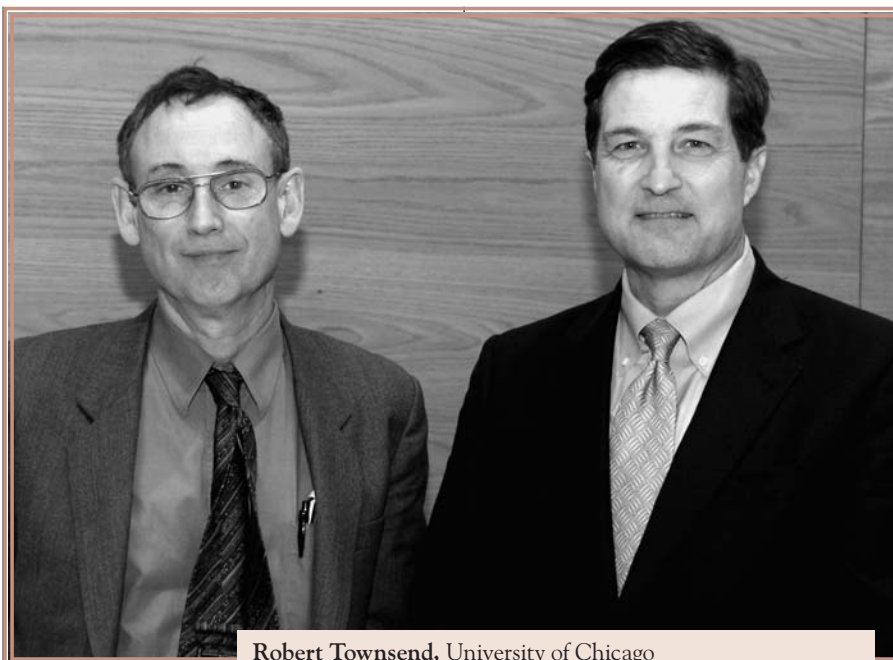
Lacker believes that financial innovation has resulted in important economic benefits. A major recent change in financial arrangements is the way financial markets allocate risks – risks are now more divisible and tradable. Borrowing costs have fallen, and consumers and businesses now have more opportunities in credit markets at better terms. Some of the innovations include unsecured credit

for households, home equity lending, securitization, financial derivatives, swaps, loan sales, and credit derivatives. The increase in household borrowing and the decline in savings since the 1980s suggest that households have substituted credit for savings as their method for smoothing income shocks. The decline in borrowing costs since the 1980s has expanded businesses' access to credit, thereby making their investment spending less dependent on internal cash flows. Lacker posits that in this way, financial innovation could have been one of the drivers of the general decline in macroeconomic volatility since the late 1980s, the so-called great moderation.

At the same time, concerns have been raised that financial innovation might be having an opposing effect by increasing financial fragility. While

innovation has made risks more divisible and therefore easier to allocate more broadly, it has also made it easier to concentrate risk. It is now easier for entities to accumulate large risk exposures and harder for counterparties to evaluate them. For example, hedge funds arbitrage away price misalignments by taking large positions in a narrow set of claims, thereby accumulating substantial risk exposures. They are able to do so because they are relatively free from the government regulation facing other financial firms, such as commercial banks. But if financial innovation has increased the possibility of systemic risk, how should policymakers respond to the risks associated with the financial activities of less-regulated intermediaries?

The answer depends on the rationale for government regulation of the financial system. Lacker pointed out two general views of regulation. According to one view, the main motivation for regulating financial intermediaries is the government safety net. Since the safety net has the potential to distort risk-taking incentives of the protected institutions, supervisory oversight is needed for institutions that receive safety-net support (but not for those that don't). According to the other view, the main motivation for regulating financial intermediaries is that there are inherent market failures in financial markets that lead to some risks, especially systemic risks, being mispriced. Government supervision helps to ameliorate systemic risk. Under this second view, financial innovation would necessitate expanding government regulation because innovation increases the potential for systemic risk. Lacker is skeptical of this second view, since he is skeptical of the extent of inherent market failures in financial markets. He acknowledges that markets are complex and evolving, and thus measuring and assessing risk are



**Robert Townsend**, University of Chicago  
**Jeffrey Lacker**, President, Federal Reserve Bank of Richmond

complex as well. Hence, mistakes will happen, resulting in significant losses to some market participants. But he argues that these are not market failures.

In Lacker's view, it is important to remember that reducing constraints and allowing institutions the freedom to produce new products can convey important benefits. He believes the portion of the financial sector that is regulated primarily via market discipline, as opposed to government regulation, has proved to be a useful testing ground for new financial products. Supervisors must have a good understanding of emerging financial products and practices both in banks and in the unregulated financial sector in order to evaluate banks' risk management practices. When innovation occurs outside the government-regulated financial sector, regulators' main concern should be with interactions between the regulated and unregulated sectors – e.g., strengthening banks' counterparty risk management practices and settlement infrastructures and being aware of how innovations may change the way exposures can

flow back into the banking sector. Lacker believes that regulators should avoid extending constraints motivated by safety-net considerations to institutions that do not receive safety-net support and should avoid extending the safety net to institutions now controlled mainly through market discipline.

**Robert Townsend**, of the University of Chicago, discussed his research agenda on evaluating the relationship between the design of financial systems in developing economies and economic development. The work involves applied general equilibrium theory, which suggests that the whole may be greater than the sum of the parts. It combines micro and macro data, and theory with empirics, making the approach taken in this research relatively rare in the field of development economics. The research suggests that changes in financial policy have disparate impacts on the various entities in the economy and on growth, inequality, and poverty. Townsend has used this approach to analyze the Thai economy, but he says the algorithm can and should be

applied to other economies.<sup>6</sup>

There are many anomalies in the Thai economy that deviate from the benchmark neoclassical economy with perfect markets and institutions. For example, initial wealth facilitates entry into business and facilitates investment for those in business. Many households appear to be constrained in occupation choice, which is symptomatic of imperfect information, and poorer households and businesses are vulnerable to variation in income and cash flow, making their consumption and investment quite variable. There appears to be less risk-sharing across households than would be the case in the benchmark economy. This opens up the possibility for policy intervention – but does not necessarily imply that it will help. Thailand did introduce several programs.

Econometric methods can be used to evaluate the impact of particular types of financial institutions and programs on households and businesses. For example, Thailand's micro-credit program provided around \$25,000 to about 72,000 villages in Thailand. Because the size of the villages varies, the per capita treatment varied, and this variation can be used to help evaluate the impact. Townsend and co-authors found that the micro-credit program has led to increases in the levels of consumption, agricultural investment, and total borrowing, at the same time both raising default rates and lowering savings rates; the Bank for Agriculture and Agricultural Cooperatives' debt moratorium program, which allowed farmers to defer or reduce payment of loans in bad years, had a neutral if not negative impact.

Townsend provided a summary of

<sup>6</sup>For more information on Townsend's Thailand project, see the many publications, databases, and models available on his website at [www.spc.uchicago.edu/users/robt/](http://www.spc.uchicago.edu/users/robt/).

macroeconomic development in Thailand. Thailand's overall growth rate has been relatively high for the past 50 years, save for the sharp downturn in 1997 because of the financial crisis. There has been a long-term trend toward industrialization, with lower family size and increased longevity. Income inequality had been increasing over this period, but since 1992, inequality has begun to decline. There are few poor people, and poverty has become a more transient phenomenon for people. The financial system has deepened, and foreign capital has been invested in the country.

Townsend noted that in measuring the economies of developing countries, including Thailand, it is important to recognize that households are producers as well as consumers. The typical national income accounts are based on corporate financial accounts and thus fail to recognize the importance of nonfarm proprietary income, which is large relative to corporate profits in developing economies. Hence, to do a proper evaluation, Townsend and co-authors constructed income accounts by hand with income, cash flow, and balance-sheet data from 700 Thai households.

Townsend's research establishes that a more developed financial system is correlated with and causally related to economic growth and reduction of poverty, but it has mixed consequences for the distribution of income. Increased

access and use of the formal financial system by the population enhances the growth of total factor productivity. According to Townsend's work, financial liberalization that facilitates access to intermediaries and weakens wealth constraints especially benefits the talented poor in the population. Increasing collateral and offering more generous credit limits appear to be more effective than interest rate subsidies. However, existing firms that use unskilled labor would tend to lose from financial liberalization. Townsend's research also indicates that the growth gains derive mainly from liberalization of the domestic financial system; increased availability of capital via foreign investment appears to have had small effects. The basic conclusion of the research is that financial systems and their evolution do matter not only for growth rates and poverty but also for the distribution of income, business formation, and investment.



Dani Rodrik, Kennedy School of Government, Harvard University



Ross Levine, Brown University

## INSTITUTIONAL ARRANGEMENTS AND ECONOMIC GROWTH AND DEVELOPMENT

Our final session expanded further on the role of institutions in fostering economic growth. **Dani Rodrik**, of the Kennedy School of Government, Harvard University, began his discussion by pointing out some of the ideas most economists agree on, some of which were cited in the earlier sessions. Most economists recognize the importance of economic growth in reducing poverty in the developing world, of domestic policy choices in determining economic outcomes in poor nations, and of market-friendly, fiscally responsible policies in generating economic growth. The challenge has been to translate these principles into effective policies.<sup>7</sup> Indeed, in Rodrik's view, the paradox is that the past quarter of a century has seen an increase in economic growth and a reduction in poverty in much of the world, while the standard policy agenda has been a failure. Countries that adopted the standard reforms have done poorly

relative to other countries and also relative to their own past performance. This echoed a point made by Zagha in the morning session.

In Rodrik's view the lesson is that the general principles of good policy do not map into specific policies. To devise effective policies, policymakers must do a lot of context-specific analysis,

and in many cases, this will result in policies that appear to be somewhat unusual or heterodox but that are in the service of orthodox policy goals. It is easier to specify the functions that good institutional arrangements perform than to specify the form they must take. For example, successful countries have, among other things, provided effective protection of property rights and contract enforcement, maintained macroeconomic stability, sought to integrate into the world economy via trade and investment, and provided effective prudential regulation of financial intermediaries. However, these do not translate directly into a unique set of policies. Indeed, as Rodrik discussed, China was able to become one of the fastest growing economies by following a strategy that

<sup>7</sup> See Dani Rodrik, "Goodbye Washington Consensus, Hello Washington Confusion? A Review of the World Bank's Economic Growth in the 1990s: Learning from a Decade of Reform," *Journal of Economic Literature*, 44:4 (December 2006) pp. 973-87; and Dani Rodrik, "Growth Strategies," in P. Aghion and S. Durlauf, eds., *Handbook of Economic Growth*, Vol. 1A (North-Holland, 2005).

targeted one binding constraint at a time – agriculture, then industry, then foreign trade, now finance – rather than trying to reform all sectors at the same time.

Rodrik said he was not advocating that other countries adopt the reforms China enacted but rather the approach. He ended his presentation with some general lessons to be taken from the policy experience over the past quarter of a century. First, binding constraints differ across countries and across time, and there is ample evidence that different approaches can lead to higher growth. For example, in some countries, the financial system is the binding constraint – there are many potentially high-return projects but not enough credit to finance them. In other countries, there is enough credit, but there are not enough high-return projects. These groups of countries would necessitate different types of reforms. Reforms have to be well-targeted to work within the political and other constraints in a country. This was a point also endorsed by Zagha in the morning session. Finally, the process must be ongoing. Institutions must be continually strengthened, and binding constraints that arise later must be addressed. A once-and-for-all reform may ignite growth but is unlikely to sustain it.

**Ross Levine**, of Brown University, elaborated on the role of the financial system in reducing poverty. In his view, much of the world has financial system policies that limit the poor's access to the financial system, and this harms the financial system's ability to improve the welfare of the poor. A large body of research suggests that a well-functioning financial system — one that seeks out entrepreneurs and projects, finances those with the highest expected returns, and monitors those investments — helps improve economic growth by improving capital



allocation.<sup>8</sup> Note that this type of financial system does not advocate equality of outcomes, but it does tend to equalize opportunities. But does a well-functioning financial system help the poor? Does it help the poor disproportionately compared to the rich in society? The research suggests the answer is yes. Across many countries and over a long period (1960-2001), there is a strong positive relationship between the level of private credit as a share of GDP (a measure of financial development) and the growth of income of the poorest 20 percent of the population, controlling for average economic growth in the country and other country traits.<sup>9</sup> The research also suggests that financial development is associated with lower income inequality. Even in the United States, evidence shows that improved efficiency of the banking systems within individual states was associated with faster state economic growth, and deregulation of branching restrictions across states had a positive impact on growth; and while it did not reverse the trend toward greater inequality, it reduced the level of inequality.

<sup>8</sup> See Asli Demirguc-Kunt and Ross Levine, eds., *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development* (The MIT Press, 2001); and Thorsten Beck, Asli Demirguc-Kunt, and Ross Levine, "Finance, Inequality, and Poverty: Cross-Country Evidence," *Journal of Economic Growth*, 12 (March 2007), pp. 27-49.

<sup>9</sup> The relationship is still positive, but it is weaker for the destitute, i.e., the fraction of the population living on less than \$1 per day.

Financial development stands out in this respect. Other government policies have been shown to have less or even a negative impact on growth and poverty. For example, government-owned banks and government loan programs for small and medium enterprises haven't been shown to reduce poverty or income inequality.



Ann Harrison, University of California at Berkeley

Levine concluded by suggesting that given the bulk of the evidence, it was time for the international policy arena to rethink the potentially large role finance can play in the fight against poverty.

**Ann Harrison**, of the University of California at Berkeley, our final speaker, addressed the important issue of the relationship between globalization and poverty. Almost all measures of globalization have increased over the past 40 years: Tariffs have fallen, and capital flows, foreign investment, and trade flows across countries have increased. At the same time, while

the number of people worldwide living in poverty is still quite high, the number has fallen. In 1980, 40 percent of people were living on less than \$1 per day; by 2000, this number had fallen to 20 percent. This raises two questions: Can globalization be used as a strategy to reduce poverty, and – an increasingly important issue – how has globalization contributed to income inequality?

Researchers addressed these questions in a study directed by Harrison.<sup>10</sup> The results of the study question the existing orthodox trade perspective. The researchers' findings include: (1) greater openness to trade is associated with *higher* inequality in poor countries; (2) financial integration is associated with *higher* consumption volatility in the less financially developed, very poor countries; (3) agricultural support in rich countries *helps* in poor countries because most poor countries are net food importers and

so benefit from being able to import food at a lower price; and (4) there does not appear to be a robust direct relationship between openness and reduction of poverty. None of these is the expected result. For example, from an orthodox trade perspective, greater openness to trade might be expected to raise the income of countries with a comparative advantage at producing

<sup>10</sup> See Ann Harrison, ed., *Globalization and Poverty*, National Bureau of Economic Research Conference Report (University of Chicago Press, Fall 2006).



goods with unskilled workers, but the opposite appears to be true. Similarly, one might expect that financial integration might enable countries to smooth consumption more, not less. Harrison posits that one reason there doesn't seem to be a robust relationship between globalization and reduction in poverty in the aggregate data is that while opening up trade results in higher growth, it also leads to more inequality. Another possibility is that the aggregate data are just too noisy to uncover the relationship if it exists.

Thus, Harrison turns to country case studies to address the question. She emphasized the importance of looking at household data, since there is a large amount of heterogeneity among the poor in response to globalization. The importance of heterogeneity was discussed by both Helpman and Townsend earlier during the Policy Forum. The research results suggest that the poor in expanding sectors do gain when globalization increases; however, the poor in previously protected sectors lose. The standard trade models would suggest that opening up to trade countries that have a

comparative advantage in producing goods with poor, unskilled workers would benefit the workers in those countries, since they would be able to export more goods. However, the standard model assumes that workers can instantaneously relocate to export-oriented sectors, and the individual country data suggest that workers cannot easily relocate to the expanding sectors. Also, poorer countries tend to have more protectionism on sectors that use unskilled workers, and the exporting firms tend to use skilled labor even in countries that have a lot of unskilled labor. Thus, the traditional models do not capture the situation in poor nations. These results suggest that bundling trade reforms with other complementary policies is needed in order to make globalization effective at reducing poverty. For example, improving the infrastructure, technology, and credit markets that inhibit moving the production of unskilled workers to world markets would be a complementary policy to help reduce poverty as trade is opened. Carefully targeted income support to those workers adversely affected by trade reform is

another example of a complementary policy that can help ensure that globalization leads to reduced poverty and benefits for all.

## SUMMARY

The 2006 Policy Forum generated lively discussion among the program speakers and audience on the challenges facing the world in reducing poverty. Recent research has helped identify policies that are potentially more effective and others that are less effective. The research suggests that most policies create both winners and losers, and to be effective at reducing poverty, policies must recognize this fact. Forum participants discussed the importance of economic growth, institutions, globalization, and financial market development in reducing poverty and income inequality. In many cases, the results of the research question the orthodox view. This underscores the value of continued rigorous economic modeling and empirical research in developing policies to further reduce the still large number of people who are living in poverty worldwide. 



You can find more Research Rap abstracts on our website at: [www.philadelphiafed.org/econ/resrap/index.html](http://www.philadelphiafed.org/econ/resrap/index.html). Or view our Working Papers at: [www.philadelphiafed.org/econ/wps/index.html](http://www.philadelphiafed.org/econ/wps/index.html).

## DEBTORS' REPAYMENT BEHAVIOR AND LOW-RISK INSURANCE STATUS

The authors present a theory of unsecured consumer debt that does not rely on utility costs of default or on enforcement mechanisms that arise in repeated-interaction settings. The theory is based on private information about a person's type and on a person's incentive to signal his type to entities other than creditors. Specifically, debtors signal their low-risk status to insurers by avoiding default in credit markets. The signal is credible because in equilibrium people who repay are more likely to be the low-risk type and so receive better insurance terms. The authors explore two different mechanisms through which repayment behavior in the credit market can be positively correlated with low-risk status in the insurance market. Their theory is motivated in part by some facts regarding the role of credit scores in consumer credit and auto insurance markets.

*Working Paper 07-14, "A Finite-Life Private-Information Theory of Unsecured Consumer Debt," Satyajit Chatterjee, Federal Reserve Bank of Philadelphia; Dean Corbae, University of Texas at Austin; and José-Víctor Ríos-Rull, University of Pennsylvania*

## FIRM DYNAMICS AND THE MARKET FOR IDEAS

The authors propose a theory of firm dynamics in which workers have ideas for new projects that can be sold in a market to existing firms or implemented in new firms: spin-offs. Workers have private information about the quality of their ideas. Because of an adverse selection problem, workers can sell their ideas to existing firms only at a price that is not contingent on their information. The authors show that the option to spin off in the future is valuable, so only workers with very good ideas decide to spin off and set up a new firm. Since entrepreneurs of existing firms pay a price for the ideas sold in the market that implies zero expected profits for them, firms' project selection is independent of their size, which, under some assumptions, leads to scale-independent growth. The entry and growth process of firms in this economy leads to an invariant distribution that resembles the one in the U.S. economy.

*Working Paper 07-15, "Spin-Offs and the Market for Ideas," Satyajit Chatterjee, Federal Reserve Bank of Philadelphia, and Esteban Rossi-Hansberg, Princeton University*