

# NBER *Reporter*

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WINTER 1996/7

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## Program Report

### International Finance and Macroeconomics

Andrew K. Rose\*

It has been three years since the NBER's Program in International Finance and Macroeconomics was last reviewed in the *NBER Reporter*. During this period, many researchers have continued to tackle the traditional problems of international finance, including: 1) the large and persistent apparent deviations from uncovered interest parity; 2) insufficient global diversification of risk; and 3) the slow convergence of real exchange rates to equilibrium levels. But many researchers have been attracted by more contemporary problems. Most notably, in the wake of the dramatic events in Europe and Latin America, there has been a resurgence of interest in the analysis of speculative attacks on fixed exchange rates and open economy monetary policy. A common goal of much of this research has been to understand better the nature of international capital flows.

This report does not attempt to be comprehensive. Many researchers in the IFM program work in overlapping fields, and much of their work is covered most appropriately in other program reports. For this reason, and for the sake of brevity, this report omits four recent "hot" areas of IFM-related research: international aspects of long-run growth; political economy; regional trading blocks; and international aspects of fiscal policy.

### Real Exchange Rates

One of the recent areas of resurgent research in open economy macroeconomics has been the examination of real exchange rates. Much of this work is distinguished by the use of innovative datasets. The new datasets are long (in terms of time span), wide (in terms of the number of economic factors, commodities, or countries examined simultaneously), or clever (they

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involve the prices of Big Macs® or *The Economist*).

Perhaps three years ago a loose consensus had developed that deviations from purchasing power parity (PPP) have a half-life of around four years, as demonstrated by Froot and Rogoff.<sup>1</sup> Not only did they find convergence to PPP, but it seemed remarkably stable across different regimes, as exemplified by a dataset stretching back almost 700 years!<sup>2</sup> Parsley, Wei, Frankel and others have confirmed this using panels of data covering many countries in the post-war period, while Cumby shows even faster convergence using an imaginative panel of Big Mac® prices.<sup>3</sup> However, Engel shows that the statistical evidence for convergence to PPP is weaker than it seems, while Taylor argues that the evidence seems to depend on the era considered.<sup>4</sup>

Since PPP can be expected to hold only in narrow circumstances, it is not surprising that the long-run *determinants* of real exchange rates continue to be a subject of great interest. In a pure accounting sense, Engel shows that real American exchange rate changes are accounted for almost completely by changes in *nominal* exchange rates; prices (even the relative price of nontradables) account for almost none of the variance, even at low frequencies.<sup>5</sup> Chinn and Johnston find that government spending and productivity trends help in the analysis of real exchange rates; their finding is confirmed by Canzoneri, Cumby, and Diba; and by De Gregorio and Wolf.<sup>6</sup> On the other hand, Clarida and Galí find little evidence of important supply-side determinants.<sup>7</sup>

International pricing *per se* remains a subject of interest to IFM researchers. Engel and Rogers show that price disparities within countries or regions are much more closely linked and likely to converge than price disparities across countries. This finding is

confirmed by Parsley and Wei, while Ghosh and Wolf document the importance of price stickiness and menu costs using a dataset consisting of prices for *The Economist* magazine.<sup>8</sup>

The renewed interest in empirical analysis of *real* exchange rates has not been matched by a comparable interest in *nominal* exchange rates.<sup>9</sup> However, the promising examination of market microstructure in the foreign exchanges begun by Lyons, Goldberg and others continues, albeit at a somewhat slower clip.<sup>10</sup>

The intertemporal approach to macroeconomic fluctuations in the open economy also continues to be an area of interest to IFM researchers. Obstfeld and Rogoff are most closely identified with this area, which forms an integral part of their new book; Razin and Milesi-Ferretti have provided related empirical analysis.<sup>11</sup>

## International Financial Markets

Perhaps the most important continuing mystery of international finance is the "forward discount premium puzzle"; countries with high interest rates tend to have appreciating rather than depreciating currencies. Thus investors who receive a high interest rate return also tend to experience capital gains from currency appreciation, a deviation from the *uncovered interest parity* condition. Backus, Foresi, and Telmer show just how hard it is to rationalize this in models based on the absence of arbitrage and a reasonable risk premium. On the other hand, Elliott and Ito argue that the profits apparently available from investments in high interest rate countries are small and variable.<sup>12</sup> Marston looks at a number of parity conditions jointly, while Lyons and I examine them during currency crises.<sup>13</sup> Flood and I find that interest differentials are linked more closely to exchange rate changes for fixed exchange rate

regimes than flexible ones; Favero, Giavazzi, and Spaventa analyze European interest rate differentials directly.<sup>14</sup> This area has been surveyed separately by both Engel and Lewis.<sup>15</sup>

While the forward discount premium puzzle links different financial asset prices, the other great unsolved problem of international finance is "home market bias" in asset stocks. This is the fact that investors tend to hold too many domestic securities for typical portfolios to be well-diversified internationally. Baxter, King, and Jerermann show that the existence of nontradables (such as human capital) makes the problem look even worse.<sup>16</sup> But Lewis, Taylor, Baxter and Crucini, show that even though risk *appears* not to be shared or smoothed adequately internationally, there are a number of reasons why there may be few important deviations from optimum conditions.<sup>17</sup>

## Speculative Attacks

After years of relative calm, the international financial system has experienced at least three waves of important speculative attacks of late. The attacks on the European Monetary System (EMS) in 1992 led to a number of devaluations and drove the United Kingdom, Italy, and Sweden from their stabilized exchange rate arrangements; the bands of the EMS were widened from  $\pm 2.25$  percent to  $\pm 15$  percent in 1993; Mexico devalued and then floated the peso in 1994; and a number of other Latin currencies were attacked in the "Tequila" aftermath. The features of these speculative attacks have led to a renewed research interest, and NBER economists have been at the forefront of this work, ably surveyed by Garber and Svensson.<sup>18</sup>

While some of these attacks were driven by economic fundamentals inconsistent with exchange rate policy, a number of them were not

clearly warranted by policy inconsistencies. Hence there was a resurgence of interest in the concept of *self-fulfilling* exchange crises. Obstfeld has worked on models where attacks shift policy in such a way as to rationalize the attack itself, while Eichengreen, Wyplosz, and I have provided empirical analysis that indirectly supports the notion of self-fulfilling crises in the EMS.<sup>19</sup> Sachs, Tornell, and Velasco argue that the Mexican crisis was self-fulfilling rather than inevitable.<sup>20</sup> On the other hand, Atkeson and Rios-Rull believe that the Mexican crisis resulted from the inevitable collision of domestic considerations and sovereign risk, while Bordo and Schwartz argue that crises historically have resulted almost always from the conflict between external and internal policy commitments.<sup>21</sup>

Another issue that has attracted interest is the way that speculative attacks on one country are associated with attacks on other currencies. Buiter, Corsetti, and Pesenti analyze this relationship in the context of Europe with a model of the center country and its periphery.<sup>22</sup> Eichengreen, Wyplosz, and I provide empirical evidence that attacks on one country tend to spill "contagiously" over to others depending on *trade* links, while Sachs, Tornell, and Velasco find that *macroeconomic* policy is the key to understanding contagion during the 1995 "Tequila Effect."<sup>23</sup>

The recent speculative attacks also have led to a host of related developments in the literature. Flood, Garber, and Kramer have extended the standard model to account for the role of sterilized intervention, a highly visible defensive tactic in recent attacks.<sup>24</sup> Flood and Marion have analyzed devaluations in emerging markets with capital controls; Frankel and I provide related empirical evidence.<sup>25</sup> Frankel and

Schmukler evaluate the returns on closed-end investment funds, and find some evidence that Mexican residents suspected the pending devaluation before foreign investors.<sup>26</sup>

## Transformation in Latin America and Europe

Many Latin American countries (including Argentina, Brazil, Chile, and Peru) have pursued far-reaching stabilization programs in recent years. A number of these stabilizations have been successful, at least thus far, as documented by Rebelo and Vegh.<sup>27</sup> Bruno and Easterly show that debtor countries with high inflation reform themselves more successfully than countries with moderate inflation.<sup>28</sup> Many of the Latin countries used fixed exchange rates as a "nominal anchor" during these stabilization programs, a subject discussed by Flood and Mussa.<sup>29</sup>

What can be fixed can be floated; the most striking feature of fixed exchange rate regimes is that they tend to collapse.<sup>30</sup> Although the behavior of exchange rates in the European Monetary System continues to be a topic of interest to IFM researchers, the field as a whole has rendered a negative verdict on fixed exchange rates.<sup>31</sup> And as fixed exchange rate regimes become increasingly unpopular, researchers have redirected their attention to alternative monetary policies. Lars Svensson has been at the forefront of recent analysts of inflation targeting.<sup>32</sup>

A growing consensus argues that fixed rates may not even be a critical component of a successful stabilization program. Tornell and Velasco show that fiscal policy may be better disciplined if exchange rates float, since lax policy is punished by exchange rate depreciation quickly.<sup>33</sup> This work is confirmed indirectly by Edwards and Losada in the context

of Latin America, and more theoretically by Persson and Tabellini.<sup>34</sup> Edwards shows how easy it was for at least some of the Latin Americans to correct their previous fiscal excesses.<sup>35</sup>

While Latin American countries continue on the road to reformation, European countries are preparing for economic and monetary union (EMU). Persson and Tabellini demonstrate the advantages of using monetary policy to target inflation for countries wishing to enter EMU.<sup>36</sup> Eichengreen and von Hagen, and Aizenman examine the role of fiscal policy in currency unions.<sup>37</sup> Ghosh and Wolf have applied mathematical techniques from genetics to determine the optimum scope of currency areas.<sup>38</sup> Frankel and I have analyzed the relationship between international trade patterns and business cycle symmetry in the same context; Alesina and Perotti provide related work on fiscal unions.<sup>39</sup>

## Capital Flows and Controls

The resumption of capital flows to Latin America in the early 1990s marked the end of "The Debt Crisis" (of the 1980s). Dooley, Dornbusch, Eaton, Fernandez, and others have taken the opportunity to review the lessons from the 1980s.<sup>40</sup> However, the new capital flows were themselves the source of much intense study, both after the Mexican crisis of 1994–5 and, remarkably, *before* the Mexico crisis.<sup>41</sup> Cole and Kehoe have shown why sovereign borrowers preserve their reputations by repaying debt in order to be able to borrow in the future.<sup>42</sup> And while most of the work of IFM researchers on empirical markets has focused on Latin America and Southeast Asia, there has also been some work on the economic transformation of Eastern Europe and the former Soviet Union.<sup>43</sup>

Capital controls continue to be an active source of interest for a number of researchers, such as Dooley.<sup>44</sup> Bartolini and Drazen model capital controls as signals of government information, thereby explaining why the removal of controls on *outflows* actually induces capital *inflows*.<sup>45</sup> Razin and Yuen show that controls can alter the slope of the Phillips curve.<sup>46</sup> Frankel argues that a "Tobin tax" on foreign exchange transactions has some advantages, though it might be difficult to enforce.<sup>47</sup> Tax policy in the context of countries that compete internationally has been the subject of intensive work.<sup>48</sup>

## Conferences and Other Activities

The IFM Program meets for a week of the annual NBER Summer Institute; typically one day's session is shared with the Asset Pricing group. In addition, since 1994 there has been an annual one-day program meeting in late March. But the IFM Program is integrally involved with a large number of other conferences, including the International Seminar on Macroeconomics, the East Asian Seminar on Economics, and the Inter-American Seminar on Economics. In 1996 Robert Hodrick organized the NBER-Universities Research Conference on the "Determination of Exchange Rates".<sup>49</sup>

Finally, no discussion of recent academic work in international economics would be complete without mention of the recently published third volume of the *Handbook of International Economics*. This was edited by NBER Research Associates Gene M. Grossman and Kenneth S. Rogoff, and includes contributions from a large number of IFM researchers.

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<sup>42</sup>H. L. Cole and P. J. Kehoe, op. cit.

<sup>43</sup>For example, D. Rodrik, "Getting Interventions Right: How South Korea and Taiwan Grew Rich" in *Economic Policy* 20 (1995). Of course there are exceptions, for example, J. D. Sachs and A. M. Warner, "Economic Convergence and Economic Policies," NBER Reprint No. 2002, September 1995, and in *Brookings Papers on Economic Activity* (January 1995), pp. 108-18; and J. D. Sachs, "Reforms in Eastern Europe and the Former

*Soviet Union in Light of the East Asian Experiences,* NBER Working Paper No. 5404, January 1996.

<sup>44</sup>M. D. Chinn and M. P. Dooley, "Asia-Pacific Capital Markets: Integration and Implications for Economic Activity," NBER Working Paper No. 5280, September 1995; and M. P. Dooley, "A Survey of Academic Literature on Controls over International Capital Transactions," NBER Working Paper No. 5232, November 1995.

<sup>45</sup>L. Bartolini and A. Drazen, "Capital Account Liberalization as a Signal,"

NBER Working Paper No. 5725, August 1996; and "When Liberal Policies Reflect External Shocks, What Do We Learn?" NBER Working Paper No. 5727, August 1996.

<sup>46</sup>A. Razin and C. W. Yuen, "Can Capital Controls Alter the Inflation-Unemployment Tradeoff?" NBER Working Paper No. 5239, August 1995.

<sup>47</sup>J. A. Frankel, "How Well do Foreign Exchange Markets Function: Might a Tobin Tax Help?" NBER Working Paper No. 5422, January 1996.

<sup>48</sup>Members of the IFM program have participated in research organized in the public economics program. See, for example, The Effects of Taxation on Multinational Corporations, M. Feldstein, J.R.Hines, Jr., and R.G.Hubbard, eds. Chicago: University of Chicago Press, 1995. See also E.G. Mendoza and L. L. Tesar, "Supply-Side Economics in a Global Economy," NBER Working Paper No. 5086, April 1995.

<sup>49</sup>NBER Reporter, Summer 1996, pp. 19-20.

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## Research Summaries

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### Evaluation of Tax Policy

Louis Kaplow\*

Much of my research on tax policy has focused on the elusive problem of evaluation. This article briefly reviews my work in three areas where this problem has been important. First, I describe a challenge to recent consensus views about how policymakers should assess the welfare costs of financing public goods through distortionary taxes and of implementing environmental taxes. Second, I summarize my work in reconciling notions of tax equity with economists' notions of social welfare. Finally, I consider the challenge of analyzing problems of tax complexity and enforcement while simultaneously assessing the equity and efficiency of the tax systems being administered.

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### Financing Public Projects and Levying Environmental Taxes

The conventional view of economists is that, in determining the optimal level of public goods and services, one must take into account directly the cost of financing those goods and services with distortionary taxes, notably, a tax on labor income.<sup>1</sup> For example, if a project entails a direct cost of \$1.00 per capita and produces a benefit of \$1.10, it may well be undesirable if, say, raising the income tax imposes a distortion of \$0.25 for every dollar of revenue raised.

My research calls this standard view into question.<sup>2</sup> Indeed, the type of projects that are usually analyzed can be financed in a manner that involves no additional distortion. For example, suppose that a new project produces benefits that rise with income (for example, police protection, which may be more valuable to those with more to protect). Suppose further that this project is financed by a tax increase that rises with income at the same rate. Then, the combina-

tion of the new project and the tax increase will not cause any change in individuals' labor effort. As people contemplate earning more, a somewhat higher share must be paid in taxes, but what remains will be worth correspondingly more because of the public project. These effects are precisely offsetting, so there are no complications from changed labor effort are absent. Hence, simple, unadjusted cost-benefit analysis is appropriate.

How can the difference between this conclusion and the conventional view be reconciled? In essence, the problem is that the conventional approach treats distributive concerns inconsistently. Raising revenue through the income tax is distortionary because it is redistributive. If, as in the earlier example, the project were financed in a distribution-neutral manner — taking into account both the distributive effects of the project and of the income tax adjustment — then there would be no distortion.

What if finance is not distribution-neutral? In particular, suppose that there is more distortion, which will

arise when there is greater net redistribution. It would be misleading to consider only the welfare cost of the distortion. A complete analysis would have to consider whether the benefit from redistribution was worth the distortionary cost. But this comparison simply poses the familiar problem of optimal redistribution: in principle and in practice, it can be resolved independent of whether a new public project is to be implemented.

The preceding result is the flip-side of an important, but often overlooked, demonstration by Hylland and Zeckhauser that cost-benefit analysis should not be weighted to account for distribution, because it is generally more efficient to meet distributive objectives through the income tax.<sup>3</sup> The view favoring distributive adjustment to cost-benefit analysis, like that favoring adjustment for income tax distortions, is incomplete. The former ignores the fact that the taxes used to finance the project may have distributive effects and, in particular, that the tax adjustment may be designed to offset the distributive effects of the project. In contrast, the latter view which emphasizes tax distortions implicitly assumes that the taxes will have redistributive effects, as they are the source of the measured distortions, but fails to include the distributive effects in the welfare analysis.

My research also casts a different light upon recent work on environmental taxation. Economists have been intrigued by the possibility of a "double dividend": the prospect that environmental taxes may both improve the environment and raise revenue that may be used to reduce distortionary income taxes. Much recent work has shown it unlikely that such positive results could prevail.<sup>4</sup> As it turns out, however, neither the simplistic double dividend hypothesis nor more sophisticated analyses provide a complete welfare analysis.

My framework for assessing public goods, as just described, is entirely applicable to environmental taxes; this is not surprising, since protecting the environment is a public good. Thus, a good benchmark for policy analysis is simply to ask what level of environmental tax (or what permit scheme or subsidy) will fully internalize the relevant externality. If the budget is balanced by adjusting the income tax in a distribution-neutral manner — taking into account the incidence of the environmental policy and the income tax adjustment — there will be no increase or decrease in the distortion of labor supply, and thus no complicating factors to consider. When studies of environmental taxation identify "welfare" costs or benefits of various policies caused by interactions with the income tax, they (like the literature on financing public goods) actually are identifying efficiency effects that arise from changes in the extent of redistribution. But in that case, one must balance the efficiency costs and the distributive benefits. Moreover, neither of these consequences of redistribution is inherent in implementing any particular environmental policy because, as noted, policymakers may use distribution-neutral income tax adjustments. (And, if any changes in redistribution were desired, they could be achieved without regard to what environmental policy was selected.)

### **Criteria for Evaluation: Tax Equity and Social Welfare**

Over the past decade, I have been investigating more broadly the appropriate method for evaluating tax policy, in particular assessing equity criteria and attempting to integrate them into economists' standard social welfare framework. My first paper on the subject challenged earlier work on "horizontal equity": the

norm that like individuals be treated alike.<sup>5</sup> In particular, I argued that there was little basis for treating horizontal equity as an independent norm, rather than as a proxy for other concerns. Whatever reason we might have for treating A in manner X, it will typically be the case that, if B is identical to A, the same reason will call for treating B in manner X. Failure to provide like treatment often will be inefficient, and also may offend more general distributive concerns. To illustrate that point, suppose that two individuals are in poverty and thus in need of public assistance, but assistance is extended only to one of them. The other will suffer, and concerns for equality to that extent will be unaddressed, without regard to whether the one helped also suffers.

Subsequently, I have revisited the subject of horizontal equity and also taken up the question of the appropriate social weight to be given to equality.<sup>6</sup> I show that anti-utilitarian tax policy norms may entail policy prescriptions that make everyone worse off. (My method of argument is similar to that first advanced by John Harsanyi, recent winner of the Nobel prize, in presenting an affirmative case for utilitarianism.<sup>7</sup>) This result should give pause to policy analysts who invoke a variety of such tax equity norms.

Using defensible criteria for evaluation and making them explicit can have a significant influence on economic policy and in motivating empirical work. To offer only one illustration, look at the attention that has been devoted to the optimal tax (and transfer program) treatment of the family unit, and the substantial body of empirical work that seeks to produce "equivalence scales" (for example, a family with two adults and two children might be found to be "equivalent" to 2.3 single individuals). To assess whether such measures make any sense, one must ask



for what purpose they are to be used. One common use is in adjusting tax and welfare payments less than in proportion to family size, to reflect measured economies of scale. Thus, a married couple pays more tax than two single individuals, each of whom earns half the income of the married couple, because it is believed that two can live cheaper than one (more accurately, cheaper than twice one!) But, as my research on the subject demonstrates, this argument is incomplete in a number of respects.<sup>8</sup> For example, the greater efficiency of the larger family unit also should count as a reason to provide more generous treatment: after all, the greater is the extent of scale economies, the more a dollar will raise the welfare of the recipient family. Once one specifies a proper social welfare framework — rather than merely trying, in a vacuum, to establish “equivalences” among family types — the relevance of this consideration and a number of others becomes apparent.

## Tax Complexity and Enforcement

With compliance and administrative costs of the federal income tax estimated to be on the order of \$100 billion and a tax gap of similar magnitude, it is no surprise that problems of complexity and enforcement have received increasing attention. The proper method of evaluating tax reforms with administrative implications is, unfortunately, difficult to discern.

Suppose, for example, that \$1 billion in private and public costs are incurred as a result of tax provisions that, summed across all taxpayers, involve \$10 billion in adjustments to taxable income. Should these complex and costly provisions be eliminated? If the adjustments are arbitrary or undesirable, this is an easy ques-

tion. But the bulk of compliance costs involve income measurement, which is unavoidable (although it may be simpler in some systems than in others). Thus, attempts to reduce costs often will result in many taxpayers paying taxes that differ from what we believe to be appropriate. In such cases, it is necessary to provide a common denominator. My research explores how this is possible.<sup>9</sup> In principle, one must refer directly to the policymaker's social welfare function in order to quantify the value of proper income measurement. Under a utilitarian welfare function this may be easier than first appears, because the welfare cost of inequity is the amount that taxpayers would be willing to pay as a sort of insurance premium to avoid being subject to the risk of income mis-measurement.

With regard to tax enforcement, there is a growing consensus that one cannot simply ask whether collections exceed budgetary costs, because collections are a transfer (presumably a desirable one, but a transfer nonetheless) whereas budgetary outlays involve a real resource cost. Thus, rather than making additional expenditures to enhance enforcement, the government could instead spend nothing more on enforcement and simply increase tax rates. As my research suggests, the fundamental difference between these alternatives — in addition to the direct cost associated with enforcement — is that different taxpayers pay different amounts of taxes.<sup>10</sup> When there is more evasion but higher nominal rates, some taxpayers face a low effective tax rate and others a high rate, rather than all facing an intermediate rate. This will tend to involve greater distortion (because tax distortion tends to rise disproportionately with tax rates) and greater inequity (which may be measured in the manner described previously). In

addition, private expenditures on evasion will differ, although the direction of the difference is formally ambiguous.

<sup>1</sup> An illuminating survey is C. Ballard and D. Fullerton, “Distortionary Taxes and the Provision of Public Goods,” NBER Reprint No. 1820, October 1993, and *Journal of Economic Perspectives* 6,3 (Summer 1992), pp. 117–131.

<sup>2</sup> L. Kaplow, “The Optimal Supply of Public Goods and the Distortionary Cost of Taxation,” *National Tax Journal* (December 1996).

<sup>3</sup> A. Hylland and R. Zeckhauser, “Distributional Objectives Should Affect Taxes but not Program Choice or Design,” *Scandinavian Journal of Economics* (1979).

<sup>4</sup> A good understanding of recent work can be gleaned from A.L. Bovenberg and L. Goulder, “Optimal Environmental Taxation in the Presence of Other Taxes: General Equilibrium Analysis,” *American Economic Review* (September 1996).

<sup>5</sup> L. Kaplow, “Horizontal Equity: Measures in Search of a Principle,” *National Tax Journal* (June 1989), pp. 139–154.

<sup>6</sup> L. Kaplow, “A Fundamental Objection to Tax Equity Norms: A Call for Utilitarianism,” NBER Reprint No. 2031, February 1996, and *National Tax Journal* 48, 4 (December 1995), pp. 497–514.

<sup>7</sup> J. Harsanyi, “Cardinal Utility in Welfare Economics and in the Theory of Risk-Taking,” *Journal of Political Economy* (August 1953), and “Nonlinear Social Welfare Functions: Do Welfare Economists Have a Special Exemption from Bayesian Rationality?,” *Journal of Political Economy* (October 1955).

<sup>8</sup> L. Kaplow, “Optimal Distribution and the Family,” NBER Reprint No. 2070, September 1996, and *Scandinavian Journal of Economics* 98, 1 (1996), pp. 75–92.

<sup>9</sup> L. Kaplow, “How Tax Complexity and Enforcement Affect the Equity and Efficiency of the Income Tax,” NBER Reprint No. 2053, May 1996, and *National Tax Journal* 49 (March 1996) pp. 135–50; and “Accuracy, Complexity, and the Income Tax.”

<sup>10</sup> L. Kaplow, “Optimal Taxation with Costly Enforcement and Evasion,” *Journal of Public Economics* 43 (November 1990) pp. 221–236; and L. Kaplow, “How Tax Complexity and Enforcement Affect the Equity and Efficiency of the Income Tax,” *supra*.

# Financial Crises

Frederic S. Mishkin\*

One of my earliest research papers, written nearly twenty years ago, focused on how imperfections in financial markets might help to explain the most severe economic contraction in U.S. history, the Great Depression.<sup>1</sup> In recent years, the development of the literature on asymmetric information and financial structure enabled me to return to this topic with a much greater understanding of how an informational breakdown in the financial system can lead to financial crises and depressions.<sup>2</sup> This summary reports on my research over the last several years on financial crises and their implications for the macroeconomy.<sup>3</sup>

## An Asymmetric Information Theory Of Financial Crises

Asymmetric information theory provides the following definition of a financial crisis: a nonlinear disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to channel funds efficiently to those who have the most productive investment opportunities. A financial crisis thus results in a sharp contraction in economic activity.

My research points to four categories of factors that promote financial crises: increases in interest rates; increases in uncertainty; deterioration in balance sheets; and bank panics. Increases in interest rates worsen

adverse selection problems for lenders, because the borrowers that are most willing to pay high interest rates are those willing to take on the most risk. Increases in uncertainty make information in the financial markets even more asymmetric, and make adverse selection and moral hazard problems worse. Deterioration in balance sheets — through a decline in net worth or adverse shocks to borrowers' cash flows — implies that borrowers have greater moral hazard incentives to engage in risky activities because they have less to lose. Bank panics reduce the amount of financial intermediation that banks can undertake, but banks are important financial institutions that reduce adverse selection and moral hazard problems within financial markets. Thus the resulting increase in moral hazard and adverse selection when these factors are present implies that lending falls, producing a decline in investment and aggregate economic activity.<sup>4</sup>

This theory of financial crises can be applied to past historical episodes. The United States has a rich history of banking and financial crises; they occurred every twenty years or so in the nineteenth and early twentieth centuries. The asymmetric information theory of financial crises nicely explains the sequence of events in U.S. financial crises.<sup>5</sup>

As the theory predicts, most U.S. financial crises indeed began with a sharp rise in interest rates (frequently resulting from a rise in interest rates abroad, particularly in the London market), a stock market crash, and an increase in uncertainty after the start of a recession, and from a failure of major financial or nonfinancial firms. During these crises the increase in uncertainty, the rise in interest rates, and the stock market crash increased the severity of adverse selection

problems in credit markets, while the decline in net worth stemming from the stock market crash also increased moral hazard problems. The increase in adverse selection and moral hazard problems, reflected in an increased spread between interest rates on low and high quality bonds, made it less attractive for lenders to lend, and led to a decline in investment and aggregate economic activity.

Because of the worsening business conditions and uncertainty about banks' health, bank panics ensued: the number of banks declined, interest rates rose even further, and the amount of financial intermediation by banks fell sharply. With the bank panics, the spread between interest rates on low and high quality bonds jumped even further, indicating an additional worsening of the problems created by adverse selection and moral hazard; this in turn led to further economic contraction.

In many of the episodes, there would then be a sorting out of insolvent firms and banks from healthy ones, and finally recovery would begin. However in other episodes, such as the 1873 panic and the Great Depression, the economic downturn and the contraction of the money supply resulting from the bank panic led to a sharp decline in prices. With the unanticipated deflation, the recovery process was short-circuited. In this situation, described by Irving Fisher as a debt-deflation, the unanticipated deflation led to a further deterioration in firms' net worth because of the increased burden of indebtedness.<sup>6</sup> As a result, investment spending and aggregate economic activity remained depressed for a long time.

The asymmetric information theory of financial crises also can be used to explain the puzzle of how a developing country can shift dramatically

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from a path of reasonable growth before a financial crisis to a sharp decline in economic activity after a crisis occurs.<sup>7</sup> Because of the different institutional features of debt markets in developing countries, the sequence of events in financial crises in these countries is different from what occurred in the United States in the nineteenth and twentieth centuries. How asymmetric information factors explain financial crises in developing countries is illustrated by the example of the Mexican financial crisis in 1994–5.

One important factor leading up to the Mexican financial crisis was the deterioration in banks' balance sheets because of increasing loan losses. This decline in bank capital meant that the banks had fewer resources to lend, which would be a factor in the later contraction in economic activity.

Consistent with the U.S. experience in the nineteenth and early twentieth centuries, the Mexican financial crisis involved a rise in interest rates abroad. The rise in U.S. interest rates in early 1994 put upward pressure on Mexican interest rates, increasing adverse selection problems in the Mexican financial system. Furthermore, the Mexican central bank — the Banco de Mexico — raised interest rates to protect the value of the peso in the foreign exchange market when the peso came under attack beginning in early 1994. The increased interest payments caused reductions in households' and firms' cash flow, which also led to a deterioration in their balance sheets. One feature of Mexican debt markets is that debt contracts have very short durations, typically less than one month. Thus, the rise in Mexican short-term interest rates, which occurred partially as a result of rising short-term rates in the United States, meant that the effect on cash flow and hence on balance

sheets would be substantial. This deterioration in households' and firms' balance sheets increased adverse selection and moral hazard problems in Mexican financial markets, which made it less desirable for lenders to lend.

Also consistent with the U.S. experience in the nineteenth and early twentieth centuries, increases in uncertainty in Mexican financial markets and a stock market decline precipitated the full-blown financial crisis. Along with increases in interest rates and the deterioration in banks' balance sheets, these factors worsened adverse selection and moral hazard problems, making the Mexican economy ripe for serious problems when a full-blown crisis developed in the foreign exchange market.

With the Colosio assassination and other political developments, including the uprising in Chiapas, the Mexican peso began to come under attack. The weakness of the banking sector made it more likely that the speculative attack would be successful, because the Mexican central bank would be subject to constraints on how far it could raise rates to defend the currency. Raising interest rates too high would cause an appreciable deterioration in bank balance sheets, thus potentially precipitating a banking crisis. Once speculators understood that it might be harder for the Mexican central bank to defend the peso with interest rate increases, a vicious circle was created in which a speculative attack was more likely to succeed, thus making it more likely to occur. Although the Banco de Mexico did raise interest rates sharply, it was unable to stem the attack and was forced to devalue the peso on December 20, 1994.

The institutional structure of debt markets in Mexico now interacted with the peso devaluation to propel the economy into a full-fledged

financial crisis. When the peso halved in value by March 1995, actual and expected inflation rose dramatically, and interest rates on debt denominated in pesos went to sky high levels, exceeding 100 percent at an annual rate. The Mexican stock market crashed, falling another 30 percent in peso terms and by over 60 percent in dollar terms. Given the resulting huge increase in interest payments because of the short duration of the Mexican debt, households' and firms' cash flow dropped dramatically, leading to a deterioration in their balance sheets. In addition, because many firms' debts were denominated in dollars, the peso depreciation resulted in an immediate increase in their indebtedness in pesos, but the value of their assets remained unchanged. The peso depreciation starting in December 1994 led to a sharp negative shock to the net worth of private firms, causing a dramatic increase in adverse selection and moral hazard problems and a deep contraction in the economy.

Then further deterioration to the economy occurred, because the collapse in economic activity and the deterioration in the cash flow and balance sheets of firms and households led to a worsening banking crisis. That crisis, along with the other factors that increased adverse selection and moral hazard problems in Mexican credit markets, explains the collapse of lending, and hence economic activity, in the aftermath of the financial crisis.

## Policy Implications

Because of the increased liquidity and globalization of financial markets and the decline of the traditional banking business, which might lead to increased risktaking on the part of banks,<sup>8</sup> the dangers of financial crises are very real for industrialized as well as emerging market countries. The

asymmetric information analysis of financial crises outlined here leads to several important policy implications.

First, governments need to pay particular attention to creating and sustaining a strong bank regulatory/supervisory system to reduce excessive risktaking in their financial systems. This implies that regulatory agencies need to be given sufficient resources to do their job properly; accounting and disclosure requirements must be adequate; prudent supervisors need to take prompt corrective action to stop undesirable activities and close down institutions that do not have sufficient net worth; and regulatory/supervisory agencies need sufficient independence from the political process so that they are encouraged to pursue prompt corrective action and avoid regulatory forbearance.<sup>9</sup>

Second, financial liberalization, although highly desirable, needs to be managed carefully. It is important that countries put in the proper bank regulatory/supervisory institutional structure before liberalizing their financial system. In addition, the financial liberalization process may have to be phased in slowly in order to keep lending booms from getting out of hand, putting stress on both bank management and bank supervisors.

Third, institutional features of the financial system besides bank regulation may need to be reformed in order to reduce the probability of financial crises. In order for the financial system to work properly, property rights must be defined well in the legal and judicial system. The predominance of short duration debt contracts and the denomination of debts in foreign currencies also can be dangerous features of a financial system that in turn increase the likelihood that a foreign exchange crisis will develop into a full-scale financial crisis.

Fourth, unanticipated fluctuations in the price level can be important in promoting financial crises: thus, the pursuit of price stability in order to avoid these fluctuations can help reduce the likelihood of financial crises.

Fifth, discount lending can be an effective tool for coping with financial crises; this suggests the need for central banks to have discount windows. However, lender-of-last-resort operations by central banks may be problematic: if they are used too frequently, they can increase the incentives for moral hazard, since financial institutions will recognize that the central bank is likely to rescue them when they are in trouble. As a consequence, financial institutions may be encouraged to take on too much risk.

Although financial crises are not an everyday occurrence, their ramifications are so serious that they always must be on policymakers' radar screens. The research outlined here can provide policymakers with some of the tools to understand these crises and help them to decide on the appropriate policy actions both for reducing the likelihood of financial crises and for coping with them when they occur.

<sup>1</sup> F. S. Mishkin, "The Household Balance Sheet and the Great Depression," *Journal of Economic History* 38, 4 (December 1978), pp. 918–37.

<sup>2</sup> A seminal paper in this literature is B. S. Bernanke, "Non-Monetary Effects of Financial Crisis in the Propagation of the Great Depression," *American Economic Review*, 73 (June 1983), pp. 257–76; this literature has been surveyed excellently in M. Gertler, "Financial Structure and Aggregate Economic Activity: An Overview," *Journal of Money, Credit and Banking* 20 (August 1988, Part 2), pp. 559–88.

<sup>3</sup> F. S. Mishkin, "Asymmetric Information and Financial Crises: A Historical Perspective," in *Financial Markets and*

*Financial Crises*, R. G. Hubbard, ed. Chicago: University of Chicago Press, 1991; "Anatomy of a Financial Crisis," in *Journal of Evolutionary Economics* 2, (1992), pp. 115–30; "Preventing Financial Crises: An International Perspective," NBER Reprint No. 1948, March 1995, and in *Papers in Money, Macroeconomics, and Finance: Proceedings of the Money, Macroeconomics, and Finance Research Group 62*, Manchester: Victoria University (1994), pp. 1–40; "Understanding Financial Crises: A Developing Country Perspective," NBER Working Paper No. 5600, May 1996, and in *Annual World Bank Conference on Development Economics 1996*, M. Bruno and B. Pleskovic, eds. Washington: World Bank, forthcoming; and "The Mexican Financial Crisis of 1994–95," in *Financial Crisis Management in Regional Blocs*, S. S. Rehman, ed. Amsterdam: Kluwer Academic Publishers, forthcoming.

<sup>4</sup> As discussed in F. S. Mishkin, "The Channels of Monetary Transmission: Lessons for Monetary Policy," NBER Reprint No. 2054, May 1996, and in *Banque de France Bulletin: Digest* 27 (March 1996), pp. 33–44, the asymmetric information analysis of financial crises outlined here is related closely to the literature on the credit view.

<sup>5</sup> F. S. Mishkin, "Asymmetric Information and Financial Crises: A Historical Perspective," *op. cit.*

<sup>6</sup> I. Fisher, "The Debt-Deflation Theory of Great Depressions," *Econometrica* 1, pp. 337–57.

<sup>7</sup> F. S. Mishkin, "Understanding Financial Crises: A Developing Country Perspective," and "The Mexican Financial Crisis of 1994–95," *op. cit.*

<sup>8</sup> F. R. Edwards and F. S. Mishkin, "The Decline of Traditional Banking: Implications for Financial Stability and Regulatory Policy," NBER Reprint No. 1989, August 1995, and in *Economic Policy Review* (Federal Reserve Bank of New York) 1, 2, (July 1995), pp. 27–45.

<sup>9</sup> One way of doing this is to have the central bank engage in bank supervision as in the United States. See F. S. Mishkin, "An Evaluation of the Treasury Plan for Banking Reform," *Journal of Economic Perspectives* 6, 1, (Winter 1992), pp. 133–53.



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## NBER Profile: *Louis Kaplow*

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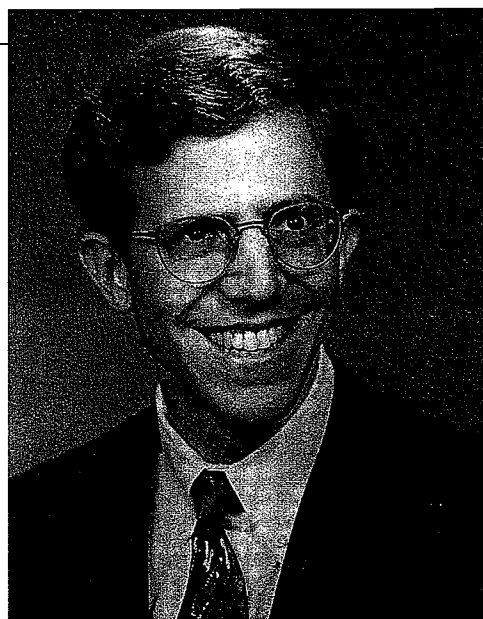
Louis Kaplow is an NBER research associate in the Programs in Law and Economics and Public Economics, and a professor at Harvard Law School. He holds a B.A. in economics and mathematics from Northwestern University, a J.D. from Harvard Law School, and a Ph.D. in economics from Harvard University.

After spending 1981–2 clerking for the Honorable Henry J. Friendly (U.S. Court of Appeals for the Second Circuit), Kaplow joined the law school faculty as an assistant professor; he became a full professor in 1987, and served as associate dean for research from 1989–91.

Kaplow teaches courses on anti-trust, law and economics, and tax-

ation. His current research includes a book on income distribution and the tax system and a project on the appropriateness of using welfare economics to evaluate legal policy. In addition to his teaching and research, he serves on the editorial boards of several prominent journals, and is a member of the Board of the American Law and Economics Association. He has also consulted with the U.S. Department of Justice's Antitrust Division and the Russian Federation's Legal Reform Project.

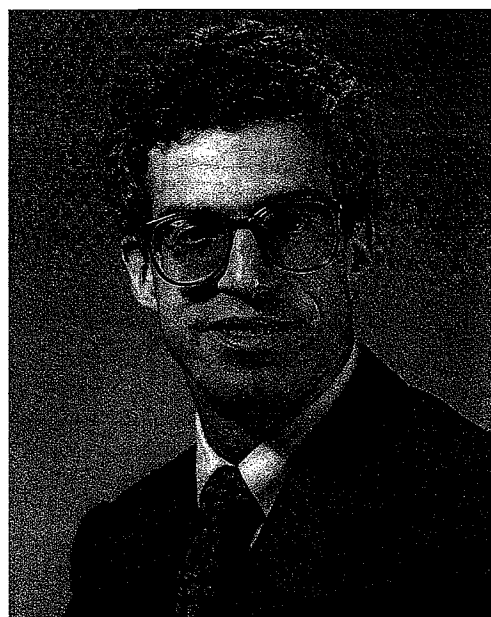
Kaplow is married to Jody E. Forchheimer, a partner at the law firm of Bingham, Dana, and Gould in Boston. They have two children: Irene, 9, and Leah, 6.



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## NBER Profile: *Frederic S. Mishkin*

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Frederic S. Mishkin, currently an executive vice president and director of research at the Federal Reserve Bank of New York, is on leave from Columbia University's Graduate School of Business, where he is the A. Barton Hepburn Professor of Economics. He is also a research associate in the NBER's Programs in Monetary Economics and Economic Fluctuations and Growth. He received his B.S. from MIT in 1973, his Ph.D. from MIT in 1976, and has taught at the University of Chicago, Northwestern University, Princeton University, and Columbia.

Mishkin's research focuses on monetary policy and its impact on financial markets and the aggregate economy. He is the author of ten books including: *A Rational Expectations Approach to Macroeconomics: Testing Policy Ineffectiveness and Efficient Markets Models* (Chicago: NBER and University of Chicago Press, 1983) and *The Economics of*

*Money, Banking, and Financial Markets*, 4th edition (New York: HarperCollins, 1995), and has published extensively in professional journals.

Mishkin has served on the editorial board of the *American Economic Review* and currently serves as an associate editor of four professional journals. He is also the editor of the Federal Reserve Bank of New York's *Economic Policy Review*. Mishkin has been an academic consultant to the Board of Governors of the Federal Reserve System, a member of the Academic Advisory Panel of the Federal Reserve Bank of New York, and a visiting scholar at the Ministry of Finance in Japan and the Reserve Bank of Australia.

Mishkin and his wife Sally live in Irvington, NY with their two children, Matthew, 14, and Laura, 9. During the summer he is an avid sailor, and he enjoys cross-country skiing in the winter.

## NBER Profile: Andrew K. Rose

Andrew K. Rose is professor and chair of Economic Analysis and Policy in the Haas School of Business at the University of California, Berkeley and acting director of the international finance and macroeconomics program of the National Bureau of Economic Research. He became acting director in September 1996 when President Clinton selected Program Director Jeffrey A. Frankel to serve as a member of the Council of Economic Advisers. Rose received his B.A. in economics and philosophy from Trinity College, University of Toronto in 1981; a M.Phil. in economics from Nuffield College, Oxford in 1983; and a Ph.D. in economics from MIT in 1986.

Rose works primarily in empirical international finance. He currently writes on exchange rates, currency crises, and open economy macroeconomics. He also has worked on topics in international trade, macro and labor economics, and the cur-

rency union of (the former) East and West Germany.

Rose edits *The Journal of International Economics*, and directs the Clausen Center for International Business and Policy at Berkeley. He is also currently a senior consultant to the U.S. Department of Treasury, where he advises the Undersecretary for International Affairs. He has taken advantage of his triple citizenship to work for all six monetary and fiscal authorities of his three home countries (Canada, the United Kingdom, and the United States), as well as for the IMF and the World Bank.

Rose lives in Berkeley, CA with his rugs for about seven months of the year, and spends most of the rest of the year elsewhere, usually in Stockholm, Brussels, or Washington. He enjoys commuting (especially when it involves long-distance travel), English art and literature, the blues, red wine, and aerobics.



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"The CPI and Beyond: Issues of Concept and Measurement," by **Zvi Griliches**.

"Works Councils and Unionization: Lessons from South Korea," by **Morris M. Kleiner** and **Young-Myon Lee**.

"The Role of Market Size in the Formation of Jurisdictions," by **Alessandra Casella**.

"The Simple Economics of Easter Island: A Ricardo-Malthus Model of Renewable Resource Use," by **James A. Brander** and **M. Scott Taylor**.

"Tax Structure and Revenue Instability Under External Shocks," by **Christina Dawkins** and **John Whalley**.



## Conferences

### The Defining Moment: The Great Depression and the American Economy in the Twentieth Century

Over thirty members and guests of the NBER's Program in the Development of the American Economy (DAE) met on October 11-13 to discuss "the Great Depression." Conference organizers Michael D. Bordo and Eugene N. White, NBER and Rutgers University, and DAE Program Director Claudia Goldin, also of Harvard University, put together this agenda:

**Charles W. Calomiris**, NBER and Columbia University, and **David C. Wheelock**, Federal Reserve Bank of St. Louis, "Was the Great Depression a Watershed for American Monetary Policy?"

Discussant: Anna J. Schwartz, NBER  
**J. Bradford DeLong**, NBER and University of California, Berkeley, "Fiscal Policy in the Shadow of the Great Depression"

Discussant: N. Gregory Mankiw, NBER and Harvard University

**Eugene N. White**, "The Legacy of Deposit Insurance: The Growth, Spread, and Cost of Insuring Financial Intermediaries"

Discussant: Lawrence J. White, New York University

**Hugh T. Rockoff**, NBER and Rutgers University, "By Way of

Analogy: The Expansion of the Federal Government in the 1930s" Discussant: Stanley L. Engerman, NBER and University of Rochester

**John J. Wallis**, NBER and University of Maryland, and **Wallace E. Oates**, University of Maryland, "The Impact of the New Deal on American Federalism"

Discussant: Robert A. Margo, NBER and Vanderbilt University

**Gary D. Libecap**, NBER and University of Arizona, "The Great Depression and the Regulating State: Federal Government Regulation of Agriculture: 1884-1970"

Discussant: Sam Peltzman, University of Chicago

**Katherine Baicker**, Harvard University, **Claudia Goldin**, and

**Lawrence F. Katz**, NBER and Harvard University, "A Distinctive System: Origins and Impact of U.S. Unemployment Compensation" Discussant: Bruce D. Meyer, NBER and Northwestern University

**Richard Freeman**, NBER and Harvard University, "Spurts in Union Growth: Defining Moments and Social Processes"

Discussant: Alan B. Krueger, NBER and Princeton University

**Jeffrey A. Miron**, NBER and Boston University, and **David N. Weil**, NBER and Brown University, "Social Security and the Great Depression" Discussant: Dora L. Costa, NBER and MIT

**Douglas A. Irwin**, NBER and University of Chicago, "From Smoot-Hawley to Reciprocal Trade Agreements: Changing the Course of U.S. Trade Policy in the 1930s"

Discussant: Robert E. Baldwin, NBER and University of Wisconsin

**Maurice Obstfeld**, NBER and University of California, Berkeley, and **Alan M. Taylor**, NBER and Northwestern University, "The Great Depression as a Watershed: International Capital Mobility over the Long Run"

Discussant: Lance E. Davis, NBER and California Institute of Technology

**Michael D. Bordo**, and **Barry Eichengreen**, NBER and University of California, Berkeley, "Implications of the Great Depression for the Development of the International Monetary System"

Discussant: James M. Boughton, International Monetary Fund

Panel Discussion: **Anna Schwartz** and **Peter Temin**

At century's end, the Great Depression still appears to be a defining moment in the economy, altering growth, institutions, policy, and economic thought. But what was the real impact of the Great Depression? Did it hasten change already underway, as perhaps in the growth of the federal government, or did it transform

the course of subsequent history, as some believe it did for fiscal policy and agricultural regulation? Was history altered in a transitory fashion, as in labor union growth, or have there been long-run impacts, as in the relative decline of state government?

**Calomiris** and **Wheelock** argue that, from the standpoint of operat-

ing procedures, the Great Depression was not a watershed for Federal Reserve policy. The tactics of policy changed little over time. These tactics contributed to both excessively contractionary monetary policy during 1929-33, and excessively expansionary monetary policy during the 1960s. There was no significant break

in either the ultimate objectives or operating framework of monetary policy. Nevertheless, the Great Depression did produce important institutional and ideological changes. Among the most important of these were the demise of the gold standard, the potential for monetization of government debt, and the increased power of the executive branch of government over monetary policy. These changes altered the constraints on the Fed, and removed key checks and balances on the long-run direction of policy. Absent the institutional changes wrought by the Depression, the inflationary surge of the 1960s and 1970s likely would have been more limited. Thus, from the perspective of a broad definition of monetary policy, the Great Depression *was* a watershed.

Before the Great Depression, the U.S. government borrowed in time of war and ran peacetime surpluses to pay off war debt. The Depression broke this pattern: both Hoover and Roosevelt wished to maintain surpluses, but both recoiled at the austerity required in the midst of the Depression. So the political nation made a virtue of necessity: it concluded that deficits in time of recession helped alleviate the downturn. The generation after World War II set tax rates and expenditure plans so that the high-employment budget would be in surplus, but did not take any steps to neutralize "automatic stabilizers" set in motion by recession. According to **De Long**, the idea that "cyclical" deficits in recession could be good has weakened the belief that "structural" deficits that permanently reduce the national savings rate are bad; fear of "structural" deficits has undermined the support for allowing the fiscal "automatic stabilizers" to work smoothly.

Without the Great Depression, the United States would not have adopted deposit insurance. While the

New Deal's anti-competitive barriers in the financial sector largely have collapsed, deposit insurance has become deeply rooted. **White** examines how market and political competition for deposits raised the level of coverage and spread insurance to all depository institutions. He compares the cost of federal deposit insurance to an (hypothetical) insurance-free system, and shows that federal insurance ultimately imposed a higher cost but achieved political acceptance because of the distribution of the burden.

**Rockoff** explores the change in ideology surrounding the Great Depression by examining the attitude of economists during 1900 to 1932 toward the reforms that were adopted in the 1930s. There was widespread and growing support among economists for increased intervention — for minimum wage laws, unemployment insurance, and government power projects — well before the Depression. Thus the ideological transformation of the 1930s can be seen as the adoption by the general public of ideas already widely supported by economists. The support for New-Deal-style reforms was based on what appeared to be successful experiments in Europe, Canada, Australia, within the United States at the state level, and in other areas. The early postwar debates witnessed a continuation of the ideological structure established in the 1930s. The stagflation of the 1970s, however, produced renewed skepticism about government intervention. This shift in public opinion, like the shift in the 1930s, was preceded by a shift in opinion among economists.

The New Deal profoundly altered the character of American federalism. The central government took on a more prominent role in the federal system, and the central and state-and-local sectors began to act more in unison rather than in their own inde-

pendent spheres. This transformation was accomplished largely through the introduction of large intergovernmental grant programs in which central funds were transferred to state-and-local officials for use in more or less specifically defined ways. In their paper, **Wallis** and **Oates** draw on a large body of fiscal data and on the political-economic history of the twentieth century to explore and document the immediate impact and longer-term legacy of the New Deal for the U.S. federal system of government.

**Libecap** shows that the New Deal increased the amount and breadth of agricultural regulation in the economy, shifting it from providing public goods and transfers to controlling supplies and directing government purchases to raise prices. Agricultural laws passed by Congress and the President from 1884 through 1970 are classified as to whether they provided public goods, gave direct and indirect transfers, or engaged in economic regulation. Additionally, laws enacted from 1940 through 1970 are classified as to whether or not they were linked to specific New Deal agricultural programs. Absent the Great Depression and the New Deal, the pattern of agricultural regulation with public goods and transfers that existed prior to 1933 might have continued through 1970.

Unemployment compensation (UI) in the United States was signed into law in August 1935 as part of the omnibus Social Security Act. The U.S. unemployment compensation system is distinctive among countries by virtue of its federal-state structure, experience rating, and limitation on benefits. **Baicker**, **Goldin**, and **Katz** contend that these features are products of the times, and thus that UI would have been different had it been passed in another decade. Their paper asks how the parameters of the UI system evolved at the state level,



and what impact experience-rating had on the seasonality of employment and its volatility over the business cycle. They show that more seasonality in manufacturing employment in 1909–29 is related to higher UI benefits from 1947 to 1969 if a state's manufacturing employment share is below the national mean. Lobbying activities of seasonal industries also appear to be important in the evolution of the parameters. Finally, there is suggestive evidence on the relationship between declining seasonality and experience rating.

**Freeman** examines union growth during the Great Depression. He argues that the burst of unionism resulted from an endogenous social process sparked by the Depression experience. He offers three pieces of evidence for this interpretation: 1) the ubiquity of spurts in unionization across countries, particularly during the Great Depression; 2) the extensive use of recognition strikes to organize workers during the 1930s spurt, relative to representation elections under the Wagner Act; and 3) the growth of CIO-affiliated unions which did not receive much financial or organizing assistance from the central organization, plus the growth of AFL-affiliated unions with little "top-down" leadership. He suggests that unionization results from a conflict between unions/workers and individual employers in which the employers have strong incentives to oppose unionization and considerable ability to do so until a large proportion of their product market competitors are organized; then unions have considerable resources to pressure employers to organize or pay the going union wage. The Depression "kicked off" this process by making workers more desirous of unions and pushing several key sectors above the "critical level" for union survival.

**Miron** and **Weil** ask to what

extent Social Security as it exists today is the same as what was created during the Depression. They conclude that there has been a surprising degree of continuity, although the world changed around the system. Most importantly, retirement has gone from being unusual to being commonplace. What began as an insurance program, which transferred money to people in the unlikely event that they reached old age and were unable to work, instead became a transfer program through which most people could expect to be recipients.

**Irwin** finds that the Great Depression was only partially responsible for the dramatic changes in U.S. trade policy during the 1930s and 1940s. With the Reciprocal Trade Agreements Act of 1934, Congress delegated unprecedented tariff-negotiating powers to the President. The subsequent fall in the average tariff, from 40–50 percent to 10 percent, was caused mostly by inflation in the 1940s that reduced the *ad valorem* equivalent of specific (nominal) duties, though. Changing economic and political interests, rather than the Great Depression, worked to establish a postwar bipartisan consensus in support of the new trade agreements program.

**Obstfeld** and **Taylor** survey the evolution of international capital mobility since the late nineteenth century. They begin with an overview of the fall and rise of integration in the global market for capital. Their discussion of institutional developments focuses on the use of capital controls and on the pursuit of macroeconomic policy objectives in the context of changing monetary regimes. The Great Depression emerges as the key turning point in the recent history of international capital markets, and offers important insights for contemporary policy debates.

**Bordo** and **Eichengreen** construct a model of the international monetary system from 1928 to 1971 and simulate its implications for the determination of the world price level and the durability of the hypothetical gold-exchange standard. Then they examine, based on regressions for a 61-country panel, the implications for economic growth and resource allocation of allowing 1920s-style international capital mobility after World War II. Based on the implications of their model simulations and the capital controls regressions, they contemplate the implications for institution building and international cooperation of the "no Great Depression" scenario.

At the end of the conference there was a panel session on the impact and legacy of the Great Depression. Schwartz stated that the key legacy of the Great Depression in the United States is the greatly expanded role of the federal government as allocator of resources, regulator of the economy, and redistributor of national income. The shift from limited to big government during the 1930s reflected two forces: support by economists and other intellectuals who viewed the Great Depression as a massive market failure which could best be solved by government; and the symbiosis of interest groups, lobbyists, and bureaucrats. In her opinion, the trend towards big government was reversed in the 1970s by three forces: stagflation, which discredited Keynesian ideology; the advent of public choice theory; and growing concern over the size of the national debt. Whether downsizing of the federal government will continue, she reflected, is unpredictable.

Temin speculated on the nature of the counterfactual question posed by the conference: how would the world have differed in the absence of a Great Depression. He discussed the problems entailed in answering

such a big question; the difficulty of constructing an explicit model, and the imprecision of using other approaches, such as cross-country and cross-industry comparisons, as a substitute for such a model; and the problem of identifying an exogenous event to disturb the model sufficiently to create the Great Depression.

Unlike many of the authors, Temin believes that the Great Depression

was not the key event that perturbed the twentieth century economy. Rather, it was the two World Wars, with the Great Depression sandwiched in between, as part of an epoch that he labeled the "Second Thirty Years War" (1914–45). World War I was the shock that shattered the prevailing equilibrium and destroyed the prewar social contract. The Great Depression and World War II were just a continuation of the dis-

equilibrium which began in 1914, he asserts. In this perspective, the 30 years of war and depression was a social and political upheaval that took another 30 years to correct.

The proceedings of this conference will appear as a volume published by the University of Chicago Press. Its availability will be announced in a future issue of the *NBER Reporter*.

## Business History Conference on Learning in Firms

Members and guests of the NBER's Program in the Development of the American Economy met in Cambridge on October 18 and 19 for a conference on business history, which focused on learning within firms. Organizers Naomi R. Lamoreaux, NBER and University of California, Los Angeles; Daniel Raff, NBER and University of Pennsylvania; and Peter Temin, NBER and MIT, planned this agenda:

**Naomi R. Lamoreaux** and **Kenneth I. Sokoloff**, NBER and University of California, Los Angeles, "Investors, Firms, and the Market for Technology: U.S. Manufacturing in the Late Nineteenth and Early Twentieth Centuries"

Discussant: Adam Jaffe, NBER and Brandeis University

**Steven W. Usselman**, Georgia Institute of Technology,

"Internalization of Discovery by American Railroads"

Discussant: Jeremy Atack, NBER and Vanderbilt University

**David Genesove**, NBER and MIT, and **Wallace P. Mullin**, NBER and Michigan State University, "The Sugar Institute Learns to Organize Information Exchange"

Discussant: Margaret Levenstein, NBER and University of Michigan

**Kazuhiro Mishina**, Japan Advanced Institute for Science and Technology, "Learning by Stretching: Revisiting the Flying Fortress Learning Curve"

Discussant: Merritt R. Smith, MIT

**David A. Hounshell**, Carnegie Mellon University, "Assets, Organizations, Strategies, and Traditions: Organizational Capabilities and Constraints in the Remaking of

Ford Motor Company, 1946–1962"

Discussant: Sidney Winter, University of Pennsylvania

**Daniel Raff** and **Peter Temin**, "Sears Roebuck in the Twentieth Century: Competition, Complementarities, and the Problem of Wasting Assets"

Discussant: Thomas Misa, Illinois Institute of Technology

**Leslie Hannah**, London School of Economics, "Marshall's 'Trees and the Global Forest': Were Giant Redwoods Different?"

Discussant: Bruce Kogut, University of Pennsylvania

**Gavin Wright**, Stanford University, "Can a Nation Learn? American Technology as a Network Phenomenon"

Discussant: Alexander Field, Santa Clara University

According to **Lamoreaux** and **Sokoloff**, the growth of an extensive market for patented technology over the 19th century posed problems as well as opportunities for firms. In particular, firms had to learn how to determine which inventions to buy in an environment where a wrong decision could mean that a competitor gained control of a vital technology.

After firms developed the capabilities needed to assess outside technological developments, they discovered that these same resources could be used to control inventive activity within their bounds. The kind of tightening up that occurred in the early 20th century, however, was very different from a systematic investment in research and development,

which for most firms was still far in the future.

**Usselman** examines the internalization of discovery by American railroads and reflects upon its broader significance in understanding technical innovation in the emergent corporate economy of nineteenth century America. He begins by tracing the competitive forces and tech-

nical factors that by midcentury prompted railroads to take a proactive role in the process of technical change. During the closing decades of the nineteenth century, as railroads confronted altered competitive conditions and a maturing technology, engineers and professional managers assumed an ever larger role in the process of technical change. Though this passage from inventive marketplace to administered innovation may have set railroads apart from most other businesses during the nineteenth century, Usselman suggests that internalization of technical change in the railroad industry may have anticipated similar developments in other systems-based industries of a later day.

**Genesove** and **Mullin** focus on the efforts of the Sugar Institute — a trade association formed by U.S. sugar cane refiners in 1928 — to facilitate the sharing of information among firms. Based upon documentary evidence, they find that the Institute was moderately successful as a governance structure, since it established a framework in which learning and adaptation could take place. The members of the Institute, operating through this framework, gradually were able to engage in cooperative information exchange. The Institute was dissolved after its activities were restricted by a 1936 Supreme Court case.

The classical model of learning-by-doing supports the empirically dubious implication that learning occurs as long as production continues, no matter how repetitive it becomes. Based on the historical data and records of the Boeing B-17 production program, **Mishina** suggests an alternative model in which learning

occurs only when a factory challenges its own frontier of production experience.

**Hounshell** explores a critical turning point in the history of the Ford Motor Company: a single meeting of Ford's Executive Committee which decisively changed the strategic course of the company. The meeting itself was not supposed to be about the strategic direction of the company; its nominal purpose was to settle a question about how funds would be allocated to build engine-manufacturing capacity for the company. But in fact, the meeting transformed an operational question into a strategic one, and in doing so put on the table the company's history, its in-place physical assets, and its core capabilities alongside its strategic objectives and opportunities.

Sears Roebuck and Co. faced similar challenges in the 1920s and 1980s. On the strength of the early period's strategic investment decisions, the company grew into the nation's largest retailer and a pervasive factor in the economy. In the later period, unanswered challenges nearly destroyed the company. **Raff** and **Temin** analyze the elements that contributed to the success in the 1920s and near disaster in the 1980s, and place them in a broader and more systematic context. They argue that successful innovations combine a focus on an attractive market with an exploitation and even enhancement of a firm's existing competitive strengths.

**Hannah** examines the fate up to 1995 of the 100 largest industrial firms in the world in 1912. Disappearance and decline were the most common outcomes, but a few outstanding performers — including

Burmah/BP and Procter & Gamble — left descendants eight or nine times their initial size in "real stock exchange price" terms. There were no significant differences in the performance of giant German, British, and American firms, other than a slightly greater tendency for the American firms to disappear. While firms in "old" industries on average performed worse than those in "new" industries, the 1912 population included equal numbers of each, and there was great variability of outcomes within industries.

**Wright** advances two propositions about the American surge into world economic leadership in the decades bracketing the turn of the twentieth century: first, that technological progress was a network phenomenon; and second, that the learning networks of that era were strongly national in character. One implication is that industrial firms could institutionalize research and development after 1900, in large part because they could draw upon, extend, and channel the energies of previously existing technological networks. In a real sense, the learning was national.

Also participating in the conference were: NBER associates Dora L. Costa of MIT and Claudia Goldin of Harvard University; Colleen Dunlavy, University of Wisconsin; Stephen Haber, Stanford University; Ben Polak, Yale University; and Ross Thomson, University of Vermont.

These articles and their discussions will be published by the University of Chicago Press. The availability of this volume will be announced in an upcoming issue of the *NBER Reporter*.

## Eleventh Annual Conference on Tax Policy and the Economy

The NBER's eleventh annual conference on "Tax Policy and the Economy" took place in Washington on October 22. James M. Poterba of MIT, who directs the NBER's research on taxation, organized this meeting.

**Daniel R. Feenberg** and **Andrew W. Mitrusi**, NBER, and **James M. Poterba**, "Comparative Tax Burdens Under the Existing Income Tax and a National Retail Sales Tax" (NBER Working Paper No. 5885)

**William M. Gentry** and **R. Glenn Hubbard**, NBER and Columbia University, "Distributional Impacts of Introducing a Broad-Based Consumption Tax" (NBER Working Paper No. 5832)

**Matthew J. Eichner**, MIT, **Mark B. McClellan**, NBER and Stanford University, and **David A. Wise**, NBER and Harvard University, "Medical Savings Accounts and the Persistence of Medical

Expenditures" (NBER Working Paper No. 5640)

**David F. Bradford**, NBER and Princeton University, and **Derrick Max**, Princeton University, "Implicit Budget Deficits: The Case of a Mandated Shift to Community-Rated Health Insurance" (NBER Working Paper No. 5514)

**Jonathan Gruber**, NBER and MIT, "Evaluating Welfare Program Expansions: Medicaid in the 1980s"

**Feenberg, Mitrusi, and Poterba** use a new file of household-level data — based on information from the IRS Individual Tax File, the Current Population Survey, the National Medical Expenditure Survey, and the Consumer Expenditure Survey — and the NBER TAXSIM program to evaluate the distributional effects of changing the federal income tax code, and of replacing the individual income tax with a consumption tax. Specifically, they analyze the long-run distributional effects of adopting a national retail sales tax that raises as much revenue as the current federal individual income tax, corporate income tax, and federal estate and gift taxes combined. They show how the resulting distributional burdens depend, for example, on "demogrants" (adjustments for family size, whether or not the household is elderly, and the like) in the retail sales tax plan. These burdens also depend on the choice between income and consumption as the basis for categorizing households into distribution tables.

**Gentry and Hubbard** find that the switch from a pure income tax to a consumption tax is likely to be less regressive than commonly assumed.

Despite the claim that consumption taxes do not tax capital income, it turns out that replacing depreciation allowances with expensing would only eliminate the taxation of the opportunity cost of capital, and not the taxation of capital income that is attributable to inframarginal returns and luck. Since wealthier households receive a larger portion of what is typically called their capital income in forms that are treated similarly by income and consumption taxes, a consumption tax would change the distribution of the tax burden by less than is suggested by assuming that it exempts all parts of capital income. Indeed, more than one-third of the reduction in the share of taxes paid by very high-income households in switching from an income tax to a consumption tax is offset by this effect, **Gentry and Hubbard** estimate.

Medical savings accounts (MSAs) recently have received considerable policy attention as one alternative approach to improving the efficiency of individual decisions about spending on health care. The Health Insurance Portability and Responsibility Act includes specific tax incentives to support the use of MSAs on a limited basis beginning in 1997. **Eichner,**

**McClellan, and Wise** review the implications of such tax incentives for insurance and health care purchasing decisions, and then focus on a crucial equity consideration: the extent to which the feasibility of MSAs is limited by the persistence of medical expenditures over an individual's working life. They conclude that persistence does not present an overriding impediment to MSAs. Finally, they consider other key behavioral issues that will be important in evaluating such plans.

**Bradford and Max** analyze the mandated purchase of (or provision by employers of) health care insurance under a system of community rating, meaning that the same price is charged for health insurance for all comers, regardless of age, sex, or health condition. Such a shift would result in redistributions of burdens by age group, in this case from existing, especially middle-aged groups toward young and future generations. For their central-case assumptions about discount, health care cost, and productivity growth rates, and about responsibility for paying health care bills, **Bradford and Max** find that a shift to community rating would generate present value gains



for people over age 30 in 1994, for example, of \$16,700 per person aged 50, at the cost to younger groups. Those born in 1994 would acquire an extra payment obligation with a discounted value of \$7,100 each. The burden passed along to future generations can be described by a \$9,300 per capita tax at birth (growing with productivity).

**Gruber** looks to the variation among states in the expansion of the

Medicaid program for clues to its effect on the well-being of poor women and children. Although one-third of Medicaid dollars go to women and children — versus two-thirds to the elderly and disabled — and although the vast majority of those newly eligible for Medicaid in the 1980s already had private health insurance, the utilization of medical care by the newly eligible Medicaid population did increase, Gruber

finds. Further, he observes a drop in infant mortality, equal to about 4,000 babies saved per year, but at a very high dollar cost.

The proceedings of this conference will be published in paperback by the MIT Press; the volume should be available in about six months. Its availability will be announced in the *NBER Reporter*. Individual papers can be ordered directly from the NBER.

## The Financing of Property/Casualty Risks

The NBER brought together nearly 100 academic economists and senior representatives of the insurance and reinsurance industries, and from a variety of financial intermediaries, on November 21–23 to share their ideas about the financing of property/casualty risks. The conference, organized by Kenneth A. Froot of NBER and Harvard University, is expected to result in a volume that will be published by the University of Chicago Press. It will include the following papers and discussions:

**Anne Gron**, Northwestern University, "Insurer Demand for Catastrophe Reinsurance"

Discussants: Steve Goldberg, USAA, and Raghuram Rajan, NBER and Northwestern University

**Christopher Lewis**, U.S. Office of Federal Housing Enterprise Oversight, and **Kevin C. Murdock**, Stanford University, "Alternative Means of Redistributing Catastrophic Risk"

Discussants: Peter A. Diamond, NBER and MIT, and Paolo Pellegrini, Mariner Investments

**David Cummins**, University of Pennsylvania, **Christopher Lewis**, and **Richard D. Phillips**, Georgia State University, "Pricing Excess-of-

Loss Reinsurance Contracts Against Catastrophic Loss"

Discussants: Sanjiv R. Das, NBER and Harvard University, and James Tilley, Morgan Stanley

**Paul R. Kleindorfer** and **Howard Kunreuther**, University of Pennsylvania, "Challenges Facing the Insurance Industry in Managing Catastrophic Risks"

Discussants: James Garven, InsWeb, and Dwight M. Jaffee, University of California, Berkeley

**Kenneth A. Froot**, and **Paul O'Connell**, Harvard University, "On the Pricing of Intermediated Risks: Theory and Application to Catastrophe Reinsurance"

Discussants: Jeremy C. Stein, NBER and MIT, and Chris Milton, American International Group

**David M. Cutler** and **Richard J. Zeckhauser**, NBER and Harvard University, "Reinsurance for Catastrophes and Cataclysms" (NBER Working Paper No. 5913)

Discussants: John H. Cochrane, NBER and University of Chicago, and Aaron Stern, Stern A.B. Inc.

**David F. Bradford**, NBER and Princeton University, and **Kyle Logue**, University of Michigan, "The Influence of Income Tax Rules on Insurance Reserves"

Discussants: Ross J. Davidson, Jr., USAA, and James R. Hines, Jr., NBER and Harvard University

**Panel 1: Barriers to and Opportunities for Low Cost Trading of Catastrophic Risk; Kenneth Froot**, Moderator

**Steven Ross**, Yale University, **Robert Litzenger**, Goldman Sachs & Co., and **Stewart C. Myers**, NBER and MIT

**Panel 2: Similarities and Differences between Catastrophic Risk and Other Markets; Martin Feldstein**, NBER and Harvard University, Moderator  
**Roberto Mendoza**, J.P. Morgan & Co., **Gary Parr**, Morgan Stanley & Co., and **Andrew Alper**, Goldman Sachs & Co.

**Panel 3: Evolving Institutions for Redistributing Catastrophic Risk; Richard Sandor**, Centre Financial Products Ltd., Moderator  
**Richard Kane**, Guy Carpenter & Co., **Frank Pierson**, Zurich Centre ReSource Ltd., and **James Umansky**, American International Group

**Panel 4: Implications for U.S. Insurers; Gordon Stewart**, Insurance Information Institute, Moderator

(Continued on page 22)

**Dennis H. Chookaszian**, CNA Insurance Co.; **Robert P. Irvan**, Cigna Corporation; and **James M. Stone**, The Plymouth Rock Company.

**David Moss**, Harvard University, "Counting Disaster: The Transformation of Federal Disaster Policy Since 1803."

Discussants: **Clement Dwyer**, Signet Star and Reinsurance Co., and **R. Glenn Hubbard**, NBER and Columbia University.

**Brian Hall**, Harvard University, and **James G. Bohn**, Federal Reserve System, "The Moral Hazard of Insuring the Insurers" (NBER Working Paper No. 5914).

Discussants: **Christopher McGhee**, Guy Carpenter & Co., and **David S. Scharfstein**, NBER and MIT.

**John Major**, Guy Carpenter & Co., "Index Hedge Performance: Insurer Market Penetration and Basis Risk."

Discussants: **Kevin Callahan**, Goldman Sachs & Co., and **Andre Perold**, Harvard University.

**Gron** examines the determinants of corporate demand for a specific type of risk reduction: insurer demand for catastrophe reinsurance. Reinsurance refers to insurance purchased by an insurer; catastrophe reinsurance is insurance for losses associated with natural hazards such as hurricanes, earthquakes, and windstorms. She finds that insurers do trade off between price and several different quantity measures when purchasing catastrophe reinsurance: as prices increase, insurers increase retention levels, decrease total limits, and increase coinsurance rates. This supports the notion that firms with greater probability of financial distress have greater demand for risk management and hence for catastrophe reinsurance. The data also indicate that insurers with greater catastrophe exposure, and larger firms, have significantly greater demand for catastrophe reinsurance. Catastrophe reinsurance does two things: it decreases the probability of insolvency and it increases liquidity after a large loss. Larger firms are likely to value the liquidity component more than smaller firms.

Over the past ten years, the human and financial costs associated with natural disasters in the United States have soared. Insurance losses from Hurricane Andrew (\$15.5 billion) and the Northridge earthquake (\$12.5 billion) alone totaled almost \$30 billion. Insured and uninsured losses from

these two events exceeded \$40 billion. In fact, even after adjusting for housing price inflation, insured losses over 1989–95 totaled almost \$75 billion, more than five times the average real insured losses during the prior four decades. Furthermore, scientific research on hurricane and earthquake exposure has demonstrated that the frequency and severity of recent disaster events are not an aberration in long-run trends, but indicate a far greater societal exposure to disaster risk than previously recognized. The recognition of this increased exposure by property-owners, insurance companies, capital markets, and state and federal governments has created considerable fissures in the system of disaster risk management in the United States — shortcomings that have been exacerbated by uncoordinated private and public sector initiatives to reduce exposure levels. **Lewis and Murdock** reexamine the disaster exposure of the United States in the context of improving society's disaster risk management system through coordinated public policy. They show that policies designed to increase the internalization of risk in individual decisionmaking and to facilitate the development of private market mechanisms for diversifying large disaster claims will result in improved risk management.

**Cummins, Lewis, and Phillips** develop a pricing methodology and pricing estimates for proposed fed-

eral excess of loss catastrophe reinsurance contracts. The contracts, proposed by the Clinton Administration, would provide per-occurrence excess-of-loss reinsurance coverage to private insurers and reinsurers, where both the coverage layer and the fixed payout of the contract are based on insurance industry losses, not company losses. In financial terms, the federal government would be selling earthquake and hurricane catastrophe call options to the insurance industry to cover catastrophic losses in a loss layer above that currently available in the private reinsurance market. The contracts would be sold annually at auction, with a reservation price designed to avoid a government subsidy and ensure that the contract would be self supporting in expected value. If a loss were to occur that resulted in payouts in excess of the premiums collected under the policies, the federal government would use its ability to borrow at the risk-free rate to fund the losses. During periods when the accumulated premiums paid into the program exceeded the losses that had been paid, the buyers of the contracts implicitly would be lending money to the Treasury, reducing the costs of government debt. The expected interest on these "loans" offsets the expected financing (borrowing) costs of the program as long as the contracts are priced appropriately. By accessing the Federal government's superior ability to diversify

risk intertemporally, the contracts could be sold at a rate lower than would be required in conventional reinsurance markets, which would potentially require a high cost of capital because of the possibility that a major catastrophe could bankrupt some reinsurers. By pricing the contracts to at least break even, the program would provide for eventual private-market "crowding out" through catastrophe derivatives and other innovative catastrophic risk financing mechanisms.

There is grave concern by the insurance and reinsurance industry that they cannot provide protection against catastrophic risks from natural, technological, and environmental hazards without exposing themselves to the danger of insolvency or significant loss of surplus. **Kleindorfer** and **Kunreuther** explore the role insurance can play along with other policy instruments, such as regulations and standards, to encourage loss reduction measures and to provide financial protection against these hazards. The challenge is to find ways to make these catastrophic risks insurable. New advances in information technology and risk assessment coupled with the emergence of new financial instruments for covering large losses provide the ingredients for rethinking the way society deals with catastrophic risks.

**Froot** and **O'Connell** model the equilibrium price and quantity of risk transfer between firms and financial intermediaries. They show that equilibrium prices will be "high" in the presence of financing imperfections that make intermediary capital costly. Moreover, small changes in financial imperfections can give rise to large changes in price. Taking the U.S. catastrophe reinsurance market as an example and using detailed data covering 1970–94, they find that the price of reinsurance generally

exceeds "fair" values, particularly in the aftermath of large events; that market power of reinsurers is not a complete explanation for such pricing; and that reinsurers' high cost of capital appears to play an important role.

**Cutler** and **Zeckhauser** examine the optimal design of insurance and reinsurance policies. They first consider reinsurance for "catastrophes": risks which are large for any one insurer but not large for the reinsurance market as a whole. Then they consider reinsurance for "cataclysms": risks that are so large that a loss can threaten the solvency of reinsurance markets as a whole. Some cataclysms can arise from a single event, such as a major earthquake or hurricane, while others derive from common risks — changes in conditions that affect large numbers of individuals — such as the liability revolution or escalating medical care costs. The authors argue that cataclysms must be reinsured in either broad securities markets or by the government. Beyond their one-period loss potential, cataclysms pose an additional risk: risk levels change over time.

**Bradford** and **Logue** seek to determine whether there are convincing measures of the discretionary element in insurance company loss reserves and whether the uses of discretion are consistent with tax-minimizing behavior. They find that aggregate industry data are broadly consistent with the tax-motivated reserving hypothesis, but there are many other candidates to explain what is, essentially, a single time series. The jury is out on the prospects for the proposed method for making this inference from cross-section data on individual firms with different tax characteristics.

**Moss** traces the evolution of federal disaster relief since 1803, highlighting a dramatic expansion after 1960 and arguing that it was entirely

consistent with broader trends in U.S. risk-management policy. The historical record suggests that high public expectations constitute a serious constraint on any federal policymakers interested in rationalizing disaster policy. Another key challenge to federal disaster policy involves new scientific research that calls into question traditional methods of forecasting disaster. Along with the one-two punch of Hurricane Andrew in 1992 and the Northridge earthquake in 1994, this new uncertainty has led many private insurers to exit the market for catastrophe risks. Since the federal government tends to cover a large fraction of uninsured losses, any reduction in private insurance coverage necessarily increases the federal burden. Moss concludes by suggesting that the French system of disaster relief, based on government reinsurance of natural catastrophe risks, may serve as a model for U.S. disaster policy in the future.

State guaranty funds (GFs) are quasi-governmental agencies that provide insurance to policyholders against the risk of insurance company failure. **Hall** and **Bohn** note that because of the time lag between premium payments and losses (which is especially lengthy in long-tail lines), writing policies is one way for insurance companies to borrow money (that is, from policyholders). Moreover, the existence of guaranty fund insurance enables insurance companies, even very risky ones, to borrow from policyholders at rates that do not reflect the insurer's default risk. Thus, one way for insurance companies to "game" the guaranty fund system is to engage in excessive premium writing. The authors find that insolvent property and casualty insurance companies tended to have very high premium growth before they failed. More than one-third of the failed insurance companies had premium growth of



more than 50 percent in the two years before failure.

**Major** addresses the performance of index-based hedges of property catastrophe risk. He models the ZIP code market penetration of an insurer, simulating the hedging of

insured catastrophe losses with two types of index futures contracts: one that permits hedge ratios to vary by ZIP code, one only by state. Major finds correlations with losses of 89–96 percent for the statewide index, and correlations over 99.5 per-

cent for the ZIP-based index. Variation of market penetration causes substantial basis risk with the statewide hedge. Loss volatility of 2.5–2.8 is reduced to 0.7–1.3 by the statewide hedge, but to 0.04–0.2 by the ZIP-based hedge.

## What Do Employers Do?

Over sixty labor economists from across the United States and Canada gathered in Cambridge on December 6–7 for an NBER-Universities Research Conference titled "What Do Employers Do? The Role of Firms in Internal and External Labor Markets." Organizers Henry S. Farber of NBER and Princeton University, and Robert S. Gibbons of NBER and Cornell University, chose the following papers for discussion:

**William E. Encinosa III**, University of Michigan; **Martin Gaynor**, NBER and Carnegie-Mellon University; and **James B. Rebitzer**, MIT, "The Sociology of Groups and the Economics of Incentives: Theory and Evidence on Compensation Systems." Discussants: Reuben Gronau, Princeton University, and Stephen Jones, McMaster University.

**Takao Kato**, Colgate University, and **Motohiro Morishima**, Keio University, "The Productivity Effects of Human Resource Management Practices: Evidence from New Japanese Panel Data."

Discussants: Casey Ichniowski, NBER and Columbia University, and Scott Stern, NBER and MIT.

**Truman F. Bewley**, Yale University, "Internal and External Pay Structures."

Discussants: Alan B. Krueger, NBER and Princeton University, and Edward P. Lazear, NBER and Stanford University.

**Rajesh Aggarwal**, Dartmouth College, and **Andrew A. Samwick**, NBER and Dartmouth College, "Executive Compensation, Strategic Competition, and Relative Performance Evaluation: Theory and Evidence."

Discussants: Kevin J. Murphy, University of Southern California, and Pinelopi K. Goldberg, NBER and Princeton University.

**Daron Acemoglu**, MIT, and **Jorn-Steffen Pischke**, NBER and MIT, "The Structure of Wages and Investment in General Training." Discussants: Sherwin Rosen, NBER and University of Chicago, and Kevin Lang, Boston University.

**Mary MacKinnon**, McGill University, and **Barton Hamilton**, Washington University, "Downsizing and Internal Labor Markets in the Great Depression."

Discussants: George Baker, Harvard University, and Mark Bils, NBER and University of Rochester.

**David N. Margolis**, University of Paris, "Firm Heterogeneity and Worker Self-Selection Bias: Estimated Returns to Seniority." Discussants: Joseph G. Altonji, NBER and Northwestern University, and Janet Currie, NBER and University of California, Los Angeles.

**John M. Abowd**, NBER and Cornell University, **Francis Kramarz**, INSEE-CREST, and **Hampton Finer**, Cornell University, "Determinants of Compensation: An Analysis of Matched Longitudinal American Employer and Employee Data." Discussants: Daniel Parent, University of Sherbrooke, and Charles G. Brown, NBER and University of Michigan.

**Encinosa** and his co-authors incorporate the sociological concept of "group norms" into an economic analysis of pay systems. Using a behavioral microeconomic model and a survey of medical groups, they find that norms are binding constraints in the choice of pay practices. While group norms matter, the pat-

terns in the data suggest that they are not all that matters. Analysis of the preferences and activities of individual physicians indicate that factors highlighted by the economic theory of agency — notably income insurance and multi-task considerations — also shape pay policies. They conclude that the sociological concept of

group norms augments rather than replaces more conventional economic analyses of pay practices.

**Kato** and **Morishima** estimate the impact on productive efficiency of various human resource management practices: information sharing devices, such as joint labor-management committees at the corporate



level (CJLMCs) and at the shop-floor level (SJLMCs); and financial participation schemes, such as profitsharing plans (PSPs) and employee stock ownership plans (ESOPs). They create an enterprise-level panel dataset for 138 Japanese manufacturing firms for 1976–92 with data on information sharing and financial participation. They find that the adoption of PSPs is associated with an 8 percent discrete increase in productivity, whereas the maturing of PSPs has no effect on productivity. There is no evidence for a discrete jump in productivity as a result of the introduction of CJLMCs, but productivity grows 1.5 percent faster than otherwise as CJLMCs mature. There is also evidence for complementarity between SJLMCs and ESOPs, and for substitutability between SJLMCs and CJLMCs.

**Bewley** contrasts internal and external pay structures. Internal pay structure is the set of rules a company uses to fix pay as a function of position, job, skill, longevity, experience, or output. External structure is the relationship between pay levels in different firms for various types of workers or jobs. Internal pay structures tend to be tight; external structures tend to be loose. Internal structure is tight in the sense that managers do not have a great deal of freedom in setting pay, given the rules of the structure. Firms make internal structure tight because workers at the same workplace tend to learn each others pay and to complain if they find inequities or violations of the structure. External structure is loose in the sense that firms have a good deal of freedom in setting their overall pay level, and because labor market forces, although powerful, are not usually strong enough to enforce a tight structure. The weakness of external structure implies that Keynes' theory of wage rigidity does not apply. The

strength of internal structure explains why in a recession firms find it difficult to reduce the pay of new hires relative to that of existing employees.

**Aggarwal** and **Samwick** argue that strategic interactions between firms in an oligopoly can explain the puzzling lack of high-powered incentives in executive compensation contracts written by shareholders whose objective is to maximize the value of their shares. They demonstrate that the use of high-powered incentives will be limited by the need to soften product market competition. In particular, when managers can be compensated based on their own and their rivals' performance, there will be an inverse relationship between the magnitude of high-powered incentives and the degree of competition in the industry. More competitive industries are characterized by weaker pay-performance incentives. There is strong evidence of this inverse relationship in the compensation of executives in the United States. The authors conclude that strategic considerations can preclude the use of high-powered incentives, in contrast to the predictions of the standard principal-agent model.

**Acemoglu** and **Pischke** offer a model in which firms are willing to invest in the general human capital of their workers. The key ingredient of their theory is the presence of labor market imperfections which distort the wage structure. In particular, firms will invest in training if the gap between productivity and wages is larger for more skilled workers. They argue that a model with imperfect labor markets is more consistent with the empirical evidence on the financing of general training.

**Hamilton** and **MacKinnon** use a sample of employee records for 1921–44 from the Canadian Pacific Railway (CPR) to examine the probabilities of promotion, demotion,

quit, and layoff. They find that internal labor markets existed at the CPR, with pay rates strongly tied to jobs, not worker characteristics. Internal promotion was the only route into some higher-level jobs. Even though most employees had strong job attachments to the CPR, quit and layoff rates, as well as promotions and demotions, responded to changes in the business cycle. In the 1930s skilled workers were shielded from layoffs and often experienced demotions. The least skilled were most likely to be laid off.

**Margolis** develops a model under which workers with different marginal productivities self-select into firms based on the firm's seniority reward policy. This may bias upwards the estimates of returns to seniority in cross-sectional and even some longitudinal studies, when differences in workforce composition are ignored. Using a large longitudinal sample of French firms and workers, he shows how several previous estimation strategies overestimate returns to seniority, particularly in firms that offer zero or negative returns to job seniority.

**Abowd** and his co-authors study full-time earnings and how they are influenced by observable and unobservable individual characteristics, and by unobservable employer characteristics. Using data from the state of Washington Unemployment Insurance System, they find that unobservable individual differences are the most important of the components of earnings, accounting for 45 percent of their variance. Unobservable differences among employers are the second most important component, accounting for 18 percent of the variance. For both industry and size effects, the unobservable individual and employer differences are important, with individual differences somewhat more important.

## Youth Unemployment and Employment in Advanced Countries

A distinguished group of European and American economists met in North Carolina on December 13 and 14 for an NBER Conference on "Youth Unemployment and Employment in Advanced Countries." This conference was funded by the Rockefeller Foundation. Its purpose was to compare and contrast the plight of the "hard-to-employ" and disadvantaged youth across the OECD countries. The conference organizers were NBER Research Associate David G. Blanchflower, Dartmouth College, and NBER Labor Studies Program Director Richard B. Freeman, Harvard University. The group's agenda was:

**Richard Freeman**, "Disadvantaged Young Men and Crime"

Discussant: Mary Corcoran, University of Michigan

**David G. Blanchflower**, and **Andrew Oswald**, University of Warwick, "The Rising Well-being of the Young"

Discussant: James Davis, University of Chicago

**Francine D. Blau**, NBER and Cornell University, and **Lawrence Kahn**, Cornell University, "Gender and Youth Employment Outcomes: the U.S. and West Germany, 1984-91"

Discussant: Steven Nickell, Oxford University

**David Card**, NBER and Princeton University, and **Thomas Lemieux**, NBER and University of Montreal, "Adapting to Circumstances: the Evolution of Work, School, and Living Arrangements among North American Youth"

Discussant: Richard B. Freeman

**John M. Abowd**, NBER and Cornell University, **Francis Kramarz**, INSEE, **Thomas Lemieux**, and **David Margolis**, University of Montreal, "Minimum Wages and Youth Employment in France and the United States"

Discussant: Bertil Holmlund, Uppsala University

**Per Anders Edin**, NBER and Uppsala University, and **Anders Forslund** and **Bertil Holmlund**, Uppsala University, "The Swedish Youth Labor Market in Boom and Depression"

Discussant: Lawrence Kahn

**James J. Heckman**, NBER and University of Chicago, and **Jeffrey Smith**, University of Western Ontario, "The Sensitivity of Experimental Impact Estimates: Evidence from the National JIPA Study"

Discussant: Lawrence Katz, NBER and Harvard University

**Wolfgang Franz**, **Joachim Inkmann**, **Winfried Pohlmeier**, and **Volker Zimmerman**,

Universität Konstanz, "Young and Out in Germany: on the Youths' Chances of Labor Market Entrance in Germany"

Discussant: Jennifer Hunt, NBER and Yale University

**Christoph Schmidt**, Universität Heidelberg, and **Klaus Zimmerman**, Universität München, "The German System: Apprenticeships and Mobility in East and West Germany"

Discussant: Jeffrey Smith

**Sanders Korenman**, NBER and University of Michigan, and **David Neumark**, NBER and Michigan State University, "Cohort Crowding and Youth Labor Markets: a Cross-National Analysis"

Discussant: Thomas Lemieux

**Paul Gregg** and **Stephen Machin**, London School of Economics, "Child Development and Success or Failure in the Youth Labor Market"

Discussant: John M. Abowd

**Kevin M. Murphy** and **Robert H. Topel**, NBER and University of Chicago, "Wages, Unemployment, and the Young" (At the time of the conference, this was still work in progress, and there was no formal discussion. However, the completed paper will appear in the NBER conference volume.)

In his paper, **Freeman** asks which young men are involved in crime; what paths they follow, both during their criminal years and (hopefully) later in the labor force; and what supervised programs might lead them back from the criminal lifestyle to a more "normal" life.

Using the U.S. General Social

Surveys and the Eurobarometer Surveys, covering the United States and 13 European countries, **Blanchflower** and **Oswald** study the reported happiness and life-satisfaction scores of random samples of young men and women. Contrary to the conventional wisdom, they find that the well-being of the young in-

creased quite markedly from the 1970s to the 1990s.

**Blau** and **Kahn** examine differences between the United States and West Germany in the employment of young workers during 1984-91. They find that less educated youth fare considerably better in Germany than in the United States, experiencing

both higher rates of employment and higher relative earnings. Both of these differences are particularly pronounced for women. Blau and Kahn suggest that low and declining real wages are probably an important explanation for the lower labor force attachment of both young men and women in the United States. Also, the public sector in Germany appears to function as an employer of last resort, absorbing some otherwise unemployable low skilled youth.

**Card** and **Lemieux** study the responses of young workers to the external labor market forces that have affected the United States and Canada over the past 25 years. They find that the traditional focus of economists' interest — youth unemployment — is highly responsive to local cyclical conditions but relatively insensitive to changes in wages. Other aspects of youth behavior also are affected by local labor market conditions. In particular, "leaving home" and the decisions of young men to enroll in school are relatively sensitive to cyclical conditions and to the relative level of youth wages. Comparable behavior for young women seems to be less systematically related to the state of local demand or the level of youth wages.

**Abowd** and his co-authors find that movements in both French and American real minimum wages are associated with relatively important effects on employment in general, and very strong effects on workers employed at the minimum wage. In the French case, a one percent increase in the real minimum wage increases the probability that a man employed at the minimum wage will lose his job by 4.4 percent. In the United States, a decrease in the real minimum of one percent increases by 3.4 percent the probability that a man employed at the minimum wage had not been employed before the change. In general, these

effects decrease with labor market experience.

**Edin** and his co-authors look at the labor market experience on Swedish youths during the depression of the 1990s and make some comparisons with earlier decades. During the 1970s and the 1980s, there was not much evidence of deteriorating performance among Swedish youths in the labor market, despite sharply increasing youth relative wages (particularly for teenagers). The slump in the 1990s was associated with dramatic increases in youth unemployment and in youth participation in active labor market programs. There is a risk that these programs may crowd out regular youth employment, the authors find; this is confirmed by their investigation of Swedish municipalities.

**Heckman** and **Smith** examine the sensitivity of experimental impact estimates to evaluation design decisions. Using data from the National JTPA Study, they find that impact estimates are sensitive to all of the design decisions that they examine, particularly to the set of training centers included in the evaluation and to the method chosen to deal with control group substitution.

**Franz** and his co-authors analyze problem groups in the youth labor market in Germany. They find, among other things, that youth unemployment is confined mainly to 20-to-24 year-olds, because teenagers are absorbed by the apprenticeship training system. By and large, youths face a higher risk of becoming unemployed in comparison with adult members of the labor force, though, but they do not stay out of work for very long. In 1990, the authors find, about 12 percent of youths did not have a smooth transition from schools of various types to apprenticeship training or further education, and another 7 percent dropped out of the labor force for some reason.

And, those youths who did not find jobs shortly after graduation from vocational training faced comparatively long episode of joblessness.

**Schmidt** and **Zimmermann** confirm that manual training is in decline — both in terms of numbers and earnings — in Germany, and that nonmanual and university training receive more attention and better payment there. However, the training system remains effective in integrating excluded groups, such as the unemployed and migrants into the labor market. Also, the rates of return to training may not have changed in the last decade. Hence, the authors write, the perceived decline in the German training system is actually a restructuring of training.

How does the age structure of the population affect the fortunes of youths in the labor market? Using data on 15 countries over more than 20 years, **Korenman** and **Neumark** estimate that the proportion of young people in the population influences their unemployment rate, but does not seem to have as much of an effect on their employment rate. Because of declines in fertility, several European countries — especially Ireland, Italy, Spain, and Portugal — will see a smaller proportion of youths in their populations over the next 16 years. This should improve their labor market picture. Other countries will not see improvement in their youth labor markets because their youth populations will only decline moderately (Finland, France, the Netherlands, and the United States) or will increase (Germany, Norway, Sweden, and the United Kingdom).

**Gregg** and **Machin** track a group of individuals born in Great Britain in a single week of March 1958 to examine how their relative success or failure in the early years of adulthood relate to the economic characteristics of the individuals in later life. They