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# NBER Reporter

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## Program Report

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### 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 Jermann 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. Buitier, 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>19</sup>M. Obstfeld, "The Logic of Currency Crises," NBER Reprint No. 1908, September 1994, and in *Cahiers économiques et monétaires 43*, Paris: Banque de France, 1994, pp. 189-213; M. Obstfeld, "Models of Currency Crises with Self-Fulfilling Features," NBER Working Paper No. 5285, October 1995, and in *European Economic Review* (May 1996); and B. Eichengreen, A. K. Rose, and C. Wyplosz, "Speculative Attacks on Pegged Exchange Rates: An Empirical Exploration with Special Reference to the European Monetary System" in *Economic Policy*, October 1995.
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<sup>34</sup>S. Edwards and F. J. Losada, "Fixed Exchange Rates, Inflation, and Macroeconomic Discipline," NBER Working Paper No. 4661, February 1994; and T. Persson and G. Tabellini, "Monetary Cohabitation in Europe," NBER Working Paper No. 5532, April 1996.

<sup>35</sup>S. Edwards, "Public Sector Deficits and Macroeconomic Stability in Developing Countries," NBER Working Paper No. 5407, January 1996.

<sup>36</sup>T. Persson and G. Tabellini, *op. cit.*

<sup>37</sup>B. Eichengreen and J. von Hagen, "Fiscal Policy and Monetary Union: Is There a Tradeoff between Federalism and Budgetary Restrictions?" NBER Working Paper No. 5517, March 1996; and J. Aizenman, "On the Need for Fiscal

Discipline in a Union," NBER Working Paper No. 4656, February 1994.

<sup>38</sup>A. R. Ghosh and H. C. Wolf, "How Many Monies? A Genetic Approach to Finding Optimum Currency Areas," NBER Working Paper No. 4805, July 1994.

<sup>39</sup>J. A. Frankel and A. K. Rose, "The Endogeneity of Optimum Currency Area Criteria," NBER Working Paper No. 4790, August 1996; and A. Alesina and R. Perotti, "Economic Risk and Political Risk in Fiscal Unions," NBER Working Paper No. 4992, January 1995.

<sup>40</sup>M. P. Dooley and K. M. Kletzer, "Capital Flight, External Debt, and Domestic Policies," NBER Working Paper No. 4793, July 1994; M. P. Dooley, "A Retrospective on the Debt Crisis," NBER Reprint No. 1980, July 1995, and in *Understanding Interdependence: The Macroeconomics of the Open Economy*, P. B. Kenen, ed. Princeton: Princeton University Press, 1995, pp. 262-88; J. Eaton and R. Fernandez, "Sovereign Debt," in *Handbook of International Economics* 3, pp. 2032-77; and R. Dornbusch, "Debt and Monetary Policy: The Policy Issues," NBER Working Paper No. 5573, May 1996.

<sup>41</sup>For prospective work, see: S. Edwards, "Macroeconomic Stabilization in Latin America: Recent Experience and Some Sequencing Issues," NBER Working Paper No. 4697, April 1994; M. P. Dooley, E. Fernandez-Arias, and K. M. Kletzer, "Recent Private Capital Inflows to Developing Countries: Is the Debt Crisis History?" NBER Working Paper No. 4792, July 1994. For retrospective analysis, see H. L. Cole and P. J. Kehoe, "Reputation Spillover Across Relationships: Reviving Reputation Models of Debt," NBER Working Paper No. 5486, March 1996; and J. A. Frankel and C. Okongwu, "Liberalized Portfolio Capital Inflows in Emerging Capital Markets: Sterilization, Expectations, and the Incompleteness of Interest Rate Convergence" in *International Journal of Finance and Economics* 1, 1 (December 1995), pp. 1-24.

<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 1955), 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

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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

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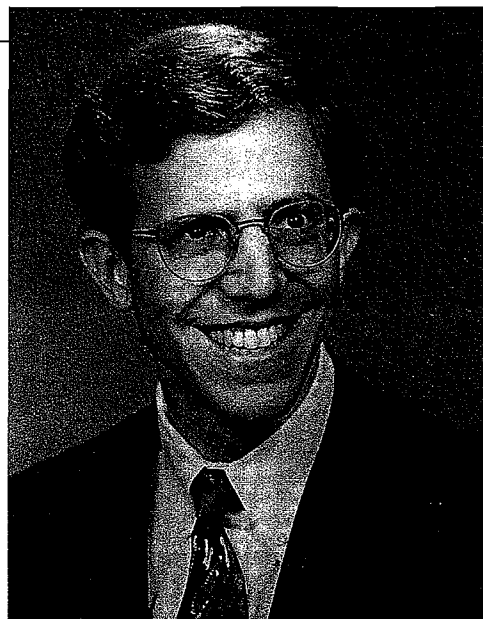
Louis Kaplow is an NBER research associate in the Programs in Law and Economics and Public Economics, and a professor at Harvard Law School. He holds a B.A. in economics and mathematics from Northwestern University, a J.D. from Harvard Law School, and a Ph.D. in economics from Harvard University.

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 antitrust, law and economics, and tax-

tion. 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.

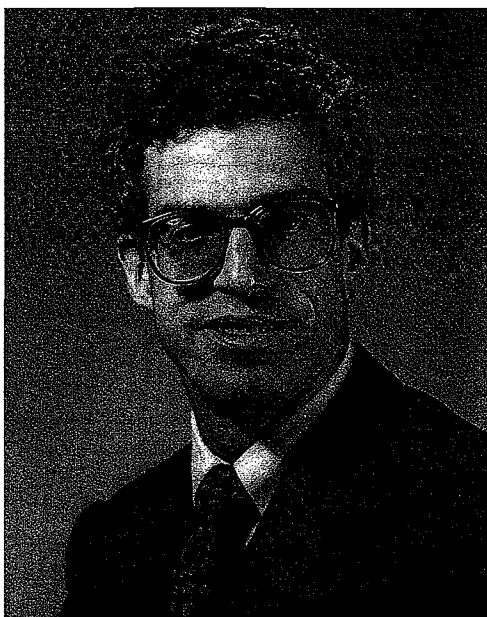
Kaplow is married to Jody E. Forchheimer, a partner at the law firm of Bingham, Dana, and Gould in Boston. They have two children: Irene, 9, and Leah, 6.



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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.



### Additional Papers

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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 I. 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 Litzenberger**, 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 F. 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 Tang, 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 JTPA 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

find that "juvenile delinquents" or those from socially disadvantaged backgrounds fare badly in terms of employment and unemployment, and their social disadvantages persist and still have a strong effect, even at

age 33. For women, the position is somewhat less bleak than for men, though. There are gender based differences after age 23, with disadvantaged men doing worse than women in terms of economic success.

It is anticipated that these papers will be published by the University of Chicago Press in a conference volume. Its availability will be announced in a future issue of the *NBER Reporter*.



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## Bureau News

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### Bureau Researchers Win TIAA-CREF Awards

NBER research associates won all three prizes for research awarded by TIAA-CREF at the recent meetings of the American Economics Association in New Orleans. Robert J. Shiller, of NBER and Yale University, won the 1996 Paul A. Samuelson Award for Outstanding Scholarly Writing on Lifelong Financial Security for his book *Macro Markets: Creating Institutions for Managing Society's Largest Economic Risks*. TIAA-CREF

CEO John H. Biggs, in presenting the award, said "Dr. Shiller's book is full of fundamental new ideas for future market developments that could do much to build financial security for individuals in the 21st century."

The Samuelson Award also includes Certificates of Excellence, which were given to the authors of the following papers: "Precautionary Saving and Social Insurance" (NBER

Reprint No. 1969) by R. Glenn Hubbard and Stephen P. Zeldes of NBER and Columbia University, and Jonathan Skinner of NBER and Dartmouth College; and "Do 401(k) Contributions Crowd Out Other Personal Saving?" (NBER Reprint No. 2026) by James M. Poterba, NBER and MIT, Steven F. Venti, NBER and Dartmouth College, and David A. Wise, NBER and Harvard University.

## Reprints Available

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1–2056 and contain abstracts of the Working Papers cited below.)

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2057. "France and the Bretton Woods International Monetary System: 1960 to 1968," by **Michael D. Bordo**, **Dominique Simard**, and **Eugene N. White** (NBER Working Paper No. 4642)

2058. "Specification Testing in Panel Data with Instrumental Variables," by **Gilbert E. Metcalf** (NBER Technical Paper No. 123)

2059. "Gender Differences in Departures from a Large Firm," by **Nachum Sicherman** (NBER Working Paper No. 4279)

2060. "Tax Subsidies to Employer-Provided Insurance," by **Jonathan Gruber** and **James M. Poterba** (NBER Working Paper No. 5147)

2061. "Did 401(k) Plans Replace Other Employer-Provided Pensions?" by **Leslie E. Papke**, **Mitchell Petersen**, and **James M. Poterba** (NBER Working Paper No. 4501)

2062. "Wage Structure and Gender Earnings Differentials: An International Comparison," by **Francine D. Blau** and **Lawrence M. Kahn** (NBER Working Paper No. 4224)

2063. "Accuracy in the Assessment of Damages," by **Louis Kaplow** and **Steven Shavell** (NBER Working Paper No. 4287)

2064. "Automobile Prices in Market Equilibrium," by **Steven T. Berry**,

**James A. Levinsohn**, and **Ariel Pakes** (NBER Working Paper No. 4264)

2065. "Is Fixed Investment the Key to Economic Growth?" by **Magnus Blomstrom**, **Robert E. Lipsey**, and **Mario Zejan** (NBER Working Paper No. 4436)

2066. "Diversification, Integration, and Emerging Market Closed-End Funds," by **Geert Bekaert** and **Michael S. Urias** (NBER Working Paper No. 4990)

2067. "Veblen Effects in a Theory of Conspicuous Consumption," by **Laurie Simon Bagwell** and **B. Douglas Bernheim** (NBER Working Paper No. 4163)

2068. "Dividends and Profits: Some Unsubtle Foreign Influences," by **James R. Hines, Jr.** (NBER Working Paper No. 3730)

2069. "Problems in the Measurement and Performance of Service-Sector Productivity in the United States," by **Robert J. Gordon** (NBER Working Paper No. 5519)

2070. "Optimal Distribution and the Family," by **Louis Kaplow** (NBER Working Paper No. 4189)

2071. "Markup Pricing in Mergers and Acquisitions," by **G. William Schwert** (NBER Working Paper No. 4863)

2072. "Why Have Separate Environmental Taxes?" by **Don Fullerton** (NBER Working Paper No. 5380)

2073. "The High Cost of Eating: Causes of International Differences in Consumer Food Prices," by **Robert E. Lipsey** and **Birgitta Swedenborg** (NBER Working Paper No. 4555)

2074. "International Differences in Male Wage Inequality: Institutions Versus Market Forces," by **Francine D. Blau** and **Lawrence M. Kahn** (NBER Working Paper No. 4678)

2075. "Uncertainty, Investment, and Industry Evolution," by **Ricardo J. Caballero** and **Robert S. Pindyck** (NBER Working Paper No. 4160)

2076. "Heterogeneity, Stratification, and Growth: Macroeconomic Implications of Community Structure and

School Finance," by **Roland Benabou** (NBER Working Paper No. 4311)

2077. "Equity and Efficiency in Human Capital Investment: The Local Connection," by **Roland Benabou** (NBER Working Paper No. 4798)

2078. "Do National Borders Matter for Quebec's Trade?" by **John F. Helliwell** (NBER Working Paper No. 5215)

2079. "Turning Points in the Civil War: Views from the Greenback Market," by **Kristen L. Willard**, **Timothy W. Guinnane**, and **Harvey S. Rosen** (NBER Working Paper No. 5381)

2080. "The Time Variation of Risk and Return in Foreign Exchange Markets: A General Equilibrium Perspective," by **Geert Bekaert** (NBER Working Paper No. 4818)

2081. "A Cross-Sectional Test of an Investment-Based Asset Pricing Model," by **John H. Cochrane** (NBER Working Paper No. 4025)

2082. "Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and the Swedish Experience," by **Francesco Giavazzi** and **Marco Pagano** (NBER Working Paper No. 5332)

2083. "Economic Implications of Changing Share Ownership," by **Benjamin M. Friedman** (NBER Working Paper No. 5141)

2084. "The Distribution of Exchange Rates in the EMS," by **Charles M. Engel** and **Craig S. Hakkio** (NBER Working Paper No. 4834)

2085. "A Comparison of the United States and Canadian Banking Systems in the Twentieth Century: Stability Versus Efficiency?" by **Michael D. Bordo**, **Angela Redish**, and **Hugh T. Rockoff** (NBER Working Paper No. 4546)

2086. "Taxation and Corporate Investment: The Impact of the 1991 Swedish Tax Reform," by **Alan J. Auerbach**, **Kevin Hassett**, and **Jan Sodersten** (NBER Working Paper No. 5189)

## Economic Fluctuations and Growth

Nearly 60 members and guests of the NBER's Program on Economic Fluctuations and Growth (EFG) gathered at the Federal Reserve Bank of Chicago on October 25 for their fall research meeting. It was organized by Lars P. Hansen, NBER and the University of Chicago, and Michael Woodford, NBER and Princeton University. The following papers were discussed:

**Jeffrey R. Campbell**, NBER and University of Rochester, and **Jonas Fisher**, Federal Reserve Bank of Chicago, "Aggregate Employment Fluctuations with Microeconomic Asymmetries" (NBER Working Paper No. 5767)

Discussant: **Ricardo J. Caballero**, NBER and MIT

**Garey Ramey** and **Joel Watson**, University of California, San Diego, "Contractual Fragility, Job Destruction, and Business Cycles"

Discussant: **Robert E. Hall**, NBER and Stanford University

**Eran Yashiv**, Tel Aviv University, "The Determinants of Equilibrium Unemployment"

Discussant: **Dale Mortenson**, Northwestern University

**Jordi Galí**, NBER and New York University, "Technology, Employment, and the Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations?"

(NBER Working Paper No. 5721)

Discussant: **Matthew D. Shapiro**, NBER and University of Michigan

**Larry E. Jones**, NBER and Northwestern University, and **Rodolfo Manuelli**, NBER and University of Wisconsin, "Policy Uncertainty and Informational Monopolies: The Case of Monetary Policy"

Discussant: **Robert E. Lucas, Jr.**, NBER and University of Chicago

**Peter Ireland**, Rutgers University, "A Small, Structural, Quarterly Model for Monetary Policy Evaluation"

Discussant: **Marin S. Eichenbaum**, NBER and Northwestern University

**Campbell** and **Fisher** provide a simple explanation for the observation that the variance of job destruction is greater than the variance of job creation: job creation is costlier at the margin than job destruction. They construct a model in which certain employment policies respond to aggregate shocks. The microeconomic asymmetries in their model can dampen the response of total job creation to an aggregate shock, and can cause total job creation to be less volatile than total job destruction.

**Ramey** and **Watson** develop a theory of labor contracting in which negative productivity shocks lead to costly job loss, despite unlimited possibilities for renegotiating wage contracts. Such fragile contracts emerge from firms' tradeoffs between robustness of incentives in ongoing employment relationships and costly specific investment. In a matching market equilibrium, contractual fragility serves as a powerful mechanism for propagating underlying productivity shocks.

**Yashiv** explores the determinants of equilibrium unemployment. Using the search and matching framework and a dataset of unique quality — Israeli employment service data — he studies the search behavior of firms and workers, and their matching process. He finds that a major reason for the rise in unemployment was the reduction in firms' dynamic demand for labor in response to a fall in profitability levels and a rise in the discount rate.

Using data for the G7 countries, **Galí** estimates conditional correlations of employment and productivity, based on a decomposition of the two series into technology and non-technology components. The picture that emerges is hard to reconcile with the predictions of the standard real business cycle model. For a majority of countries, the following results stand out: 1) technology shocks appear to induce a negative comovement between productivity and employment, counterbalanced by a positive comovement generated by

demand shocks; 2) the impulse responses show a persistent decline of employment in response to a positive technology shock; and 3) measured productivity increases temporarily in response to a positive demand shock. More generally, the pattern of economic fluctuations attributed to technology shocks seems to be largely unrelated to major postwar cyclical episodes. A simple model with monopolistic competition, sticky prices, and variable effort accounts for the empirical findings.

**Jones** and **Manuelli** study the effects of monetary uncertainty on the level of output. They show that in a world in which trading partners have asymmetric information about the current state of monetary policy, monetary uncertainty can result in reduced trade and a loss in welfare. When the gathering of information is treated endogenously, high inflation results in two sources of welfare loss: in addition to the reduction in trade, agents will spend time and effort

gathering socially useless (but privately useful) information.

**Ireland** develops a small, structural model of the U.S. economy, and estimates it with quarterly data on output, prices, and money from 1959

through 1995. His estimates reveal that the Federal Reserve has insulated the economy successfully from the effects of demand-side disturbances, so that most of the observed variation in aggregate output reflects the

impact of supply-side shocks. Indeed, Federal Reserve policy has responded efficiently to these shocks, although the rate of inflation on average has been too high.

## Higher Education

Members and guests of the NBER's Working Group on Higher Education met in Cambridge on October 25 to discuss their recent and ongoing research. NBER Research Associate Charles T. Clotfelter, also of Duke University, organized the following agenda:

**T. Aldrich Finegan** and **John J. Siegfried**, Vanderbilt University, "Would a Shortage of New Economics Ph.D.s Hurt College Teaching?"

**William F. Becker**, **John R. Powers**, and **Phillip Saunders**, Indiana University, "Problems of Missing Student Data in the TUCE

III Data Set and the Importance of Class Size in Student Achievement" Discussant for both papers: Richard Murnane, NBER and Harvard University

**Andrew W. Dick**, University of Rochester, and **Aaron S. Edlin**, NBER and University of California, Berkeley, "The Implicit Taxes from College Financial Aid" (NBER Working Paper No. 5316)

Discussant: James R. Hines, Jr., NBER and Harvard University

**Michael S. McPherson**, Williams College, and **Morton O. Schapiro**, University of Southern California, "Are We Keeping College

Affordable? Student Aid, Access, and Choice in American Higher Education"

Discussant: Charles T. Clotfelter

Presentations of Work in Progress:

**Charlotte Kuh**, National Research Council, "The Market for New Ph.D.s: Mechanisms and Measures" Discussant: Paula Stephan, Georgia State University

**Thomas J. Kane**, NBER and Harvard University, "Policy Issues in Student Financial Aid"

Discussant: Sandra Baum, Skidmore College

Using data from the third edition of the Test of Understanding College Economics (TUCE) collected from 117 classes in introductory economics taught at 34 different colleges, **Finegan** and **Siegfried** ask whether students taught by regular faculty with Ph.D. degrees learn more than students taught by faculty with only M.A. degrees. After controlling for other characteristics of instructors, schools, and students, the authors find no significant association between an instructor's final degree and several objective measures of student learning in introductory macroeconomics classes. Further, students in introductory microeconomics taught by instructors with Ph.D.s learned substantially and significantly less. In neither course was there a significant net association between the instruc-

tor's degree and student assessments of amount learned or instructor effectiveness. This suggests that a future shortage of Ph.D. economists would not reduce student learning in introductory economics courses.

**Becker**, **Powers**, and **Saunders** use an uncensored TUCE dataset to assess the importance of class size and other class-specific variables on student attrition during a course. They also consider how this attrition and other variables influence scores on the "posttest". Finally, they consider the problems of missing data that are associated with the self-reported student questionnaire information contained in the TUCE dataset. Contrary to others, these authors find that once missing data problems are addressed, the class size at the beginning of the term is

related negatively and significantly to the post-micro TUCE score. In part this is the result of students in larger classes being significantly more likely than students in smaller classes to withdraw from the course before taking the posttest.

Families who earn more, or who heed the advice of "experts" and save for college, typically receive less financial aid. The financial aid system therefore implicitly taxes both income and assets. **Dick** and **Edlin** use awards data to estimate these implicit taxes, and find that at average-priced colleges the marginal income tax ranges from 2 percent to 16 percent, and the marginal levy on assets from 8 percent to 26 percent. A typical family loses aid worth about \$11,000 at average-priced colleges and \$15,000 at expensive colleges by



accumulating an extra \$50,000 in assets.

**McPherson** and **Schapiro** begin with an overview of changes over time in the financing of American colleges and universities, focusing on the role of governments, institutions, and families in meeting college costs. They then turn to a consideration of the implications of these recent

financing trends for the issue of access to college for people of all economic backgrounds. Their focus is on the demand for college enrollment. They find that students' choices about where to go to school seem to be increasingly constrained by finances.

Also participating in this meeting were: Julie Berry Cullen, MIT; Mal-

colm Getz, Vanderbilt University; Zvi Griliches, Caroline Minter Hoxby, and Lawrence F. Katz, NBER and Harvard University; Stephen A. Hoenack, University of Minnesota; Judith Li, Harvard University; Linda Loury, Tufts University; Sarah Turner, University of Michigan; and Gordon Winston, Williams College.

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## Health Economists Meet

The NBER's Program on Health Care, directed by Alan M. Garber of Stanford University, held its fall meeting in Cambridge on October 30. The following papers were discussed:

**Aaron Yelowitz**, NBER and University of California at Los Angeles, "Public Policy and Health Care Choices of the Elderly: Evidence from the Medicare Buy-in Program"

**Charles Mullin** and **Tomas Philipson**, University of Chicago, "Market-Based Old-Age Mortality Forecasts"

**Richard Frank**, NBER and Harvard University, and **David S. Salkever**, NBER and Johns Hopkins University, "Relationships between Price Behavior in Private and Public Markets: The Case of Vaccines"

**William Encinosa**, University of Michigan; **Martin Gaynor**, NBER and Carnegie Mellon University; and **James B. Rebitzer**, MIT,

"The Sociology of Groups and the Economics of Incentives: an Empirical Analysis of Pay Systems"

**Paul Gertler**, NBER and University of California, Berkeley, and

**Jonathan Gruber**, NBER and MIT, "Health Shocks and Consumption"

During the past decade, the Medicaid program has undergone a series of changes relating to eligibility. In particular, two new categories of elderly Medicaid recipients, known as Qualified Medicare Beneficiaries (QMBs) and Specified Low Income Medicare Beneficiaries (SLMBs), were created. The income and asset limits to qualify under these programs were less strict than the limits under existing Medicaid categories, and 1.9 million senior citizens were enrolled in the QMB program in 1993. **Yelowitz** finds that actual Medicaid eligibility increased dramatically, from 8 percent in 1987 to 12.5 percent in 1995. The expansions for the elderly resulted in dramatically higher Medicaid takeup rates than similar expansions for children. For every 100 elderly who became eligible, 55 took it up. Approximately one-half of the new Medicaid recipients had some private form of supplemental insurance coverage, resulting in crowdout of 50 percent. Crowdout was concentrated among the youngest of senior citizens (aged 65 to 69). Among this younger group, crowdout was 66 percent. Among the oldest in the sample (aged 75 and older), crowdout was much smaller (25 percent). As expected, crowdout appears to come from individuals dropping privately purchased health insurance rather than dropping employer provided retiree health

insurance. Finally, there is weak evidence that expansions increased health care utilization.

The future course of old-age mortality is of extreme importance to the public sector expenditures in many countries in which programs such as Social Security and Medicare involve large fractions of the public budget. **Mullin** and **Philipson** argue that the competitive market prices of mortality contingent claims, such as annuities and life-insurance, contain useful information about the market's opinion of the course of future old-age mortality. They find that the market reveals a continued fall in cohort-specific hazard functions that is larger than that predicted by government bureaucrats.

The U.S. market for vaccines is characterized by the federal government's large role as a purchaser and distributor; small numbers of supplier firms; and limits on short-run expansion of production capacity. Interactions between pricesetting for public and private sales in this market can be interrelated in various ways. **Frank** and **Salkever** explore these interactions and find that private prices strongly affect prices negotiated by the federal government. Further, the direct effect of increasing numbers of suppliers occurs mainly in the private pricing process; the effect on government

prices is not strong (holding private sector prices constant).

**Encinosa** and his co-authors incorporate the sociological concept of "group norms" — the social interactions that result from individuals' comparisons of their effort and pay level with those of their coworkers — into an economic analysis of pay systems. Using a behavioral model and a unique survey of medical groups, they find that norms are binding constraints in the choice of pay practices. But while group norms matter, they are not all that matters. Among a sample of physicians, income insurance and multi-task considerations also shape pay policies. The authors conclude that the concept of group norms augments rather than replaces more conventional economic analyses of pay practices.

**Gertler** and **Gruber** investigate the ability of households in Indonesia to smooth their consumption around major changes in the health status — measured by an index of activities of daily living (ADL) — of the household head. Using data from 1991 and 1993, they find that household heads who see reductions in their ADL index are likely to drop out of the labor force, significantly lowering the income of their family. Indonesian families appear able to smooth only about 1/3 of the income lost because of a major illness.

## Fall Meeting of Asset Pricing Program

The NBER's Program on Asset Pricing, directed by John Y. Campbell of Harvard University, held its fall meeting on November 4 at Northwestern University as guests of Campbell's co-organizer for the meeting, John C. Heaton of NBER and Northwestern. The day's agenda was:

**Nicholas Barberis**, University of Chicago; **Andrei Shleifer**, NBER and Harvard University; and **Robert W. Vishny**, NBER and University of Chicago, "A Model of Investor Sentiment"

Discussant: Kenneth J. Singleton, NBER and Stanford University

**Kent Daniel**, University of

Chicago; **David Hirshleifer**, University of Michigan; and **Avanidhar Subrahmanyam**, University of California, Los Angeles

"A Theory of Overconfidence, Self-Attribution, and Security Market Under- and Overreactions"

Discussant: Blake D. LeBaron, NBER and University of Wisconsin

**Giorgio DeSantis** and **Bruno Gerard**, University of Southern California, "How Big is the Premium for Currency Risk?"

Discussant: Angel Serrat, University of Chicago

**Andrew W. Lo** and **Jiang Wang**, NBER and MIT, "Trading Volume, Part I: Definitions, Data Analysis

and Implications of Portfolio Theory"

Discussant: Torben Andersen, Northwestern University

**John Y. Campbell** and **Luis M. Viciera**, "Consumption and Portfolio Decisions when Expected Returns are Time Varying" (NBER Working Paper No. 5857)

Discussant: Stanley E. Zin, NBER and Carnegie-Mellon University

**Erzo G.J. Luttmer**, Northwestern University, "Consumption and Portfolio Choice in the Presence of Fixed Costs"

Discussant: John H. Cochrane, NBER and University of Chicago

**Barberis, Shleifer, and Vishny** point out that recent empirical research in finance has uncovered two pervasive facts: underreaction of stock prices to news, such as earnings announcements, and overreaction of stock prices to a series of good or bad news. They model investor sentiment — that is, how investors form beliefs — consistent with these empirical findings. Their model is based on psychological evidence, and produces both under- and overreaction under a wide range of circumstances.

**Daniel, Hirshleifer, and Subrahmanyam** propose a theory based on investor overconfidence and biased self-attribution to explain several of the securities returns patterns that seem anomalous from the perspective of efficient markets with rational investors. The premise of the theory is that individuals are overconfident about their ability to evaluate securities, in the sense that they overestimate the precision of their private information signals. As a result, there is overreaction to the

arrival of private information and underreaction to the arrival of public information.

**DeSantis and Gerard** focus on the role of currency risk in international financial markets. They find a role for both market and foreign exchange risk. However, both sources of risk are detected only when their prices are allowed to change over time. The evidence also indicates that, with the exception of the U.S. equity market, the premium for bearing currency risk often represents a significant fraction of the total premium.

**Lo and Wang** examine the implications of portfolio theory for the cross-sectional behavior of equity trading volume. They test the theory using weekly turnover data for NYSE and AMEX securities from 1962 to 1994, and find strong evidence against two-fund separation. Volume appears to be driven by a two-factor linear model.

**Campbell and Viciera** propose a new approach to a classic unsolved problem in financial economics: the

optimal choice of consumption and portfolio on the part of a long-lived investor facing time-varying investment opportunities. When their model is calibrated to U.S. stock market data, it implies that intertemporal hedging motives greatly increase, and may even double, the average demand for stocks by investors whose risk-aversion coefficients exceed one.

**Luttmer** defines a lower bound on the fixed cost that is required for observations of consumption choices to be consistent with data on asset returns and a given set of preferences. He estimates that a consumer with "log utility" who consumes at the level of U.S. per capita consumption must face a fixed cost of at least 3 percent of monthly per capita consumption. The fixed cost bound declines rapidly with increases in risk aversion, or when certain restrictions on short selling are included.

## Labor Studies Program Meeting

Members of the NBER's Program in Labor Studies, directed by Richard Freeman of Harvard University, met in Cambridge on November 1 to discuss this recent research.

**Jonathan Gruber**, NBER and MIT, "Disability Insurance Benefits and the Labor Supply of Older Persons" (NBER Working Paper No. 5366)

**Aaron Yelowitz**, NBER and University of California, Los Angeles, "Did Recent Medicaid Reforms Cause the Caseload Explosion in the Food Stamp Program?"

**Li Hao**, University of Chicago, and **Sherwin Rosen**, NBER and the University of Chicago, "Unraveling in Assignment Markets" (NBER Working Paper No. 5729)

**Alan B. Krueger**, NBER and Princeton University, "Do Markets Respond More to More Reliable Labor Market Data? A Test of Market Rationality" (NBER Working Paper No. 5769)

**Jennifer Hunt**, NBER and Yale University, "Has Work-sharing Worked in Germany?" (NBER Working Paper No. 5724)

Do workers quit their jobs when disability benefits increase? To try to answer this question, **Gruber** studies the Canadian experience, which involves two distinct disability insurance (DI) programs, one for Quebec and the other for the rest of Canada. The latter program raised its benefits by 32 percent in January 1987, while benefits remained constant in Quebec. Gruber finds that there was a sizeable labor supply response to the policy change; he estimates that the elasticity of labor force nonparticipation with respect to DI benefits is 0.32. This response may be large enough to wipe out any welfare gains from the increase in benefits.

Using data from the Survey of Income and Program Participation, **Yelowitz** shows that expanding eligibility for Medicaid during the 1980s increased participation in the food stamp program: the expansions explain approximately 10 percent of the growth in food stamps between 1987 and 1995. He concludes that this effect came mainly through increased awareness of the food stamp program, with decreased labor supply explaining only a small portion of the growth. One implication of this finding, Yelowitz notes, is that scaling back Medicaid eligibility is not likely to reduce the food stamp

rolls, even though expanding Medicaid eligibility increased them.

**Hao** and **Rosen** model the market for job assignments with uncertainty about applicants' productivity in the first period. They use their model to understand incentives toward early contracts or "unraveling" in labor markets for entry-level professionals. The economic benefit of unraveling is to provide insurance in the absence of complete markets, but it can come at the cost of inefficient assignments. Without reentry, unraveling need not occur. If unsuccessful early contracts can be bought out by the employer, then inefficiencies in assignments are eliminated, and unraveling always occurs between firms and the more promising applicants. The efficiency gains of buyouts can be distributed unevenly, though, and sometimes firms benefit from a ban on buyouts.

Since 1979, the Bureau of Labor Statistics (BLS) has nearly quadrupled the size of the sample it uses to estimate monthly employment changes. The magnitude of sampling variability has declined in proportion to the increase in the sample size. Still, there is no evidence that the bond market's reaction to employment news intensified in the late 1980s or early 1990s. For the time period as a

whole, **Krueger** reports, an unexpected increase of 200,000 jobs is associated with an 8-basis point increase in the interest rate on 30-year Treasury bonds, and a 9-basis point increase in the interest rate on 3-month bills, all else equal. Additionally, announced hourly wage increases are associated with higher long-term interest rates, while announced changes in the unemployment rate and revisions to past months' employment estimates have a statistically insignificant effect on long-term interest rates.

Starting in 1985, (West) German unions began to reduce standard hours on an industry-by-industry basis in an attempt to lower unemployment. Using both individual data from the German Socio-Economic Panel and industry data, **Hunt** finds that in 1984-9, employment rose by 0.3 to 0.7 percent in response to a one-hour fall in standard hours, but that total hours worked fell by 2 to 3 percent, implying possible output losses. As a group, workers were better off, however, because the wage bill rose. Still, the growth in employment — at most 1.1 percent — was not enough to bring Germany close to the U.S. rate, and the results for 1990-4 were even more pessimistic, **Hunt** reports.

## Well-Being of Children

Members of the NBER's Program on the Well-being of Children, directed by Jonathan Gruber of NBER and MIT, held their fall meeting in Cambridge on November 2. They discussed the following research:

**Janet Currie**, NBER and University of California, Los Angeles (UCLA), and **Duncan Thomas**, UCLA, "Does Subsequent School Quality Affect the Long-Term Gains from Head Start?"

**John Cawley**, **Lance Lochner**,

and **Edward Vytalil**, University of Chicago, and **James J. Heckman**, NBER and University of Chicago, "Ability, Education, Job Training, and Earnings"

**Caroline M. Hoxby**, NBER and Harvard University, "When Parents Can Choose, What Do They Choose? The Effect of Greater School Choice on Curriculum"

**David M. Blau**, University of North Carolina, "The Effect of Income on Child Development"

**Jay P. Greene**, **Leesa Boeger**, and **Curtis L. Frazier**, University of Houston, and **Paul E. Peterson** and **Jiangtao Du**, Harvard University, "The Effectiveness of School Choice in Milwaukee: A Secondary Analysis of Data from the Program's Evaluation"

**Cecilia E. Rouse**, NBER and Princeton University, "Revisiting the Milwaukee Evidence" (work in progress)

Using data from the 1988 "wave" of the National Educational Longitudinal Survey, **Currie** and **Thomas** show that black and Hispanic children who attended Head Start go on to poorer quality schools than other minority children (that is, all minority children do poorly in these schools.) Some aspects of school quality do influence gains for black children from the Head Start program: hours of homework; average attendance; standards for promotion to next grade; and whether the school is public or private. Class size and teacher qualifications have little effect on how well black children who attended Head Start do in school, though. Currie and Thomas conclude that "the effects of Head Start fade out more rapidly among minority students than among whites, because minority Head Start children are more likely to subsequently attend 'bad' schools."

**Heckman** and his co-authors examine the role of ability in explaining the rise in the economic return to education. They find mild evidence that the college-high school premium by age has increased most for persons of high ability. They also note that the available evidence on the role of ability in reducing the growth

in the return to schooling is for young people. In an economic environment that shifts in favor of skilled labor, the return to ability increases, but the college-high school wage differentials by age increase uniformly across all ability levels. A shift in demand towards high skill workers reduces the college-high school differential for young workers. Thus, the evidence for young workers which is featured in discussions of the effect of ability on returns to schooling, is a poor guide to the effect of ability on wages and the return to education over the life cycle.

Using data on 769 school districts' curricular and extracurricular policies along with data on the demographics of these districts, **Hoxby** finds that what parents say they want out of schools is what they really choose when they have the opportunity to choose among schools. Schools operating in metropolitan areas where parents have more choice among school districts (through residential decisions) exhibit: more parental involvement; more challenging curricula; stricter academic requirements; and more structured and discipline-oriented environments.

**Blau** estimates the effects of family income on child development, as

measured by scores on tests of cognitive, social, and emotional development. He finds that the effects are small. Fixed family background characteristics play a much more important role than income in determining child outcomes. Thus, policies that affect family income will have little direct impact on child development.

**Greene** and his co-authors examine the results of the Milwaukee school choice plan, approved by the Wisconsin state legislature in 1990. They find that students in choice schools, in their third and fourth years, scored from 3 to 5 percentage points higher on average in reading and 5 to 12 points higher in mathematics than a randomly selected control group. By way of comparison, a difference of 8 points wipes out half the observed difference between the performance of whites and minorities on nationally standardized tests.

In 1990, Wisconsin became the first state in the country to provide vouchers to low-income students to attend nonsectarian private schools. **Rouse** estimates the effect of the program on math and reading scores. She compares the academic achievement of students who were selected to those who were not selected, and then estimates the effectiveness of

private schools relative to public schools. She finds that the Milwaukee Parental Choice Program had a posi-

tive effect on the math achievement of those who attended a private

school, but had no benefit for reading scores.

## Program Meeting on Public Economics

Roughly 50 members of the NBER's Program on Public Economics, directed by James M. Poterba of NBER and MIT, met in Cambridge on November 7 and 8. They discussed the following papers:

**Mark B. McClellan**, NBER and Stanford University, and **Jonathan S. Skinner**, NBER and Dartmouth College, "The Distribution of Medicare Benefits: A Lifetime Perspective"

Discussant: Hilary W. Hoynes, NBER and University of California, Berkeley

**Don Fullerton**, NBER and University of Texas, and **Gilbert E. Metcalf**, NBER and Tufts University, "Environmental Controls, Scarcity Rents, and Pre-existing Distortions"

**Lawrence H. Goulder**, NBER and Stanford University, and **Ian W.H. Parry** and **Dallas Burtraw**,

Resources for the Future, "Revenue Raising Versus Other Approaches to Environmental Protection: The Critical Significance of Pre-Existing Tax Distortions"

Discussants (for both papers): Richard J. Arnott, NBER and Boston College, and Louis Kaplow, NBER and Harvard University

**David M. Cutler**, NBER and Harvard University, and **Mark B. McClellan**, "The Determinants of Technological Change in Heart Attack Treatment" (NBER Working Paper No. 5751)

Discussant: Burt Weisbrod, Northwestern University

**James R. Hines, Jr.**, NBER and Harvard University, "Tax Credits, Bond Prices, and Investment" Discussant: Alan J. Auerbach, NBER and University of California, Berkeley

**Jonathan Gruber**, NBER and MIT

"Disability Insurance Benefits and the Labor Supply of Older Persons" (NBER Working Paper No. 5866 — see "Labor Studies Program Meeting" earlier in this section of the NBER Reporter for a description of this paper.)

Discussant: John Bound, NBER and University of Michigan

**Patric H. Hendershott**, NBER and Ohio State University, **Dennis R. Capozza**, University of Michigan, and **Richard Green**, University of Wisconsin, Madison, "Taxes, House Prices, and Housing Competition" Discussant: James M. Poterba

**Hans-Werner Sinn**, NBER and University of Munich, "Subsidiarity Principle and Market Failure in Systems Competition" (NBER Working Paper No. 5411)

Discussant: Stephen Coate, NBER and University of Pennsylvania

**McClellan** and **Skinner** use claims data from the 1990 Medicare 5 percent sample of beneficiaries to measure overall Medicare spending and mortality experiences for a sample of roughly 1.4 million people over age 65. They find that expenditures are typically higher for high income households, with nearly 40 percent difference between the top and bottom income deciles among those age 85 and over. For the younger groups, mortality rates among low income households are substantially higher than among households with more income. However, procedures used largely by higher income groups may have little

marginal impact on health status. Hence, finding that higher income groups receive more in Medicare benefits does not address the harder question of whether higher income groups enjoy greater improvements in health relative to poorer groups.

**Fullerton** and **Metcalf** show that whether policies raise revenue or not, they can increase welfare through environmental protection without exacerbating the distortion of labor. These favorable effects can be achieved by taxes that raise revenue, through certain regulations that raise no revenue, and even with subsidies that cost revenue. Policies that generate privately-retained scarcity rents

which raise the costs of production and equilibrium output prices, and thus reduce the real net wage, will exacerbate the pre-existing distortion of the labor tax. Such policies include both quantity-restricting command and control policies, and marketable permit policies.

**Goulder** and his co-authors find that interactions with pre-existing taxes fundamentally influence the costs of regulation and seriously militate against pollution abatement policies that do not raise revenue. These results are relevant to government regulation outside the environmental area as well, they note. To the extent that government regulations of

international trade or agricultural production raise the costs of output and thereby reduce real factor returns, these regulations exacerbate the labor market distortions from pre-existing taxes and thus can involve higher social costs than would be indicated by partial equilibrium analyses.

**Cutler and McClellan** examine the sources of expenditure growth in heart attack treatment. First they show that essentially all of the cost growth is a result of the diffusion of particular intensive technologies; the prices paid for a given level of technology have been constant or falling over time. Examining a number of factors, they conclude that insurance variables, technology regulation, and provider interaction have the largest effect on technological diffusion.

**Hines** examines the effect of tax

incentives on corporate investment. Tax benefits for certain assets encourage firms to shift their investments toward those assets. Such shifting reduces the expected pretax profitability of investment, thereby reducing payoffs to bondholders in the event of bankruptcy. Anticipation of this asset substitution raises the risk premium on corporate debt, which in turn discourages investment. The interaction between interest rates and tax policy can be so powerful that targeted tax incentives have little effect on aggregate business investment, and in some circumstances may even reduce total investment.

**Hendershott** and his co-authors assess the impact of income and property taxes on house prices using data for 63 metropolitan areas from 1970 to 1990. They find that marginal

income and property tax rates are capitalized fully in house prices and explain a significant proportion of the regional variation in those prices. They show that the removal of the interest and property tax deduction will reduce the average house price by 14 percent and could result in house price declines of up to 30 percent in some locations.

According to **Sinn**, systems competition cannot work when governments respect the Subsidiarity Principle, which implies that governments will step in where markets fail. He presents three models which illustrate this point: one concerned with congestion-prone public goods; a second which considers the insurance function of redistributive taxation; and a third which studies the role of quality regulation.

## Corporate Finance Program Meeting

Forty members and guests of the NBER's Program in Corporate Finance, directed by Robert W. Vishny of NBER and the University of Chicago, attended the fall program meeting in Cambridge on November 15. Their agenda was:

**Stuart C. Gilson**, Harvard University, and **Jerold B. Warner**, University of Rochester, "Junk Bonds, Bank Debt, and Financial Flexibility."

Discussant: Steven N. Kaplan, NBER and University of Chicago

**David S. Scharfstein** and **Jeremy C. Stein**, NBER and MIT, "The Dark Side of Internal Capital Markets: Divisional Rent-seeking and Inefficient Investment."

Discussant: Luigi Zingales, NBER and University of Chicago

**Benjamin Esty**, Harvard University, "Liability Rules and Risk-Taking in Commercial Banks."

Discussant: Raghuram G. Rajan, NBER and Northwestern University

**Josh Lerner**, NBER and Harvard University, "The Government as

Venture Capitalist: The Long-Run Impact of the SBIR Program" (NBER Working Paper No. 5753)

Discussant: Michael J. Barclay, NBER and University of Rochester

**Roni Michaely**, Cornell University

**Richard H. Thaler**, NBER and University of Chicago; and **Shlomo Benartzi**, University of California, Los Angeles, "Do Dividend Changes Signal the Future or the Past?"

Discussant: Krishna Palepu, Harvard University

**Gilson and Warner** investigate why firms issue junk bonds and then use the proceeds to pay down their bank debt. They suggest that firms undertake these substitutions to preserve financial flexibility. Junk bond substitutions typically occur around negative earnings surprises. Since junk bonds contain substantially fewer and less restrictive covenants

than bank debt, and also because they mature later, these substitutions reduce the probability of default and increase the range of activities in which firms can engage. The earnings surprises are short term, and firms eventually reborrow from banks. Junk bond issues convey negative information about sample firms' prospects and cause stock prices to

fall, but the decline is less severe for firms that benefit more from the increased financial flexibility.

**Scharfstein and Stein** show how rent-seeking behavior on the part of division managers can subvert the workings of an internal capital market. In an effort to stop rent-seeking, corporate headquarters will be forced into effectively paying bribes to some



division managers. And, because headquarters is itself an agent of outside investors, the bribes may take the form not of cash, but rather of preferential capital budgeting allocations. One interesting feature of their model is a kind of "socialism" in internal capital allocation, whereby weaker divisions tend to get subsidized by stronger ones.

From 1863–1933, commercial bank shareholders were subject to a broad range of liability rules ranging from limited liability to unlimited liability for creditor obligations. By increasing shareholder liability, the regulators hoped to reduce the incentives for risk shifting in these highly leveraged institutions. Using data from 1911–15, **Esty** finds that equity trades as if contingent liability were in effect, and that portfolio allocation is

a function of the severity of liability. This shows that the shape of the equityholders' payoff function has a significant impact on incentives, particularly with regard to risk taking. More generally, contingent liability could be an effective complement to existing bank regulations.

**Lerner** examines the impact of the largest U.S. public venture capital initiative, the Small Business Innovation Research (SBIR) program, which has provided over \$6 billion to small high technology firms between 1983 and 1995. Using a unique database of awardees compiled by the U.S. General Accounting Office, he shows that SBIR awardees grew significantly faster than a matched set of firms over a 10-year period. The positive effects of SBIR awards were confined to firms based in zip codes with sub-

stantial venture capital activity.

Many dividend theories imply that changes in dividends contain information about the future earnings of the firm. **Benartzi, Michaely, and Thaler** investigate this implication, and find little support for it. Firms that increase dividends in a given year have significant earnings increases in that year and the prior year, but show no subsequent unexpected earnings growth. Also, the size of the dividend increase does not predict future earnings. However, dividend changes do have predictive power for future returns. Firms that increase dividends have significantly positive excess returns for the next three years, while firms that cut dividends experience (less significant) negative excess 3-year returns.

## NBER's Monetary Economists Meet

The NBER's Program on Monetary Economics, led by N. Gregory Mankiw of NBER and Harvard University, met in Cambridge on November 15. Nearly 40 members and invited guests discussed these papers:

**Alberto Alesina**, NBER and Harvard University, and **Roberto Perotti**, Columbia University, "Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects" (NBER Working Paper No. 5730)

Discussant: Allen Drazen, NBER and University of Maryland

**V.V. Chari**, University of Minnesota; **Patrick J. Kehoe**, NBER and University of

Pennsylvania; and **Ellen R. McGrattan**, NBER and University of Minnesota, "Sticky Price Models of the Business Cycle: Can the Contract Multiplier Solve the Persistence Problem?" (NBER Working Paper No. 5809)

Discussant: Julio J. Rotemberg, NBER and MIT

**Frederic S. Mishkin**, Federal Reserve Bank of New York, "Understanding Financial Crises: A Developing Country Perspective" (NBER Working Paper No. 5600)

Discussant: Aaron Tornell, NBER and Harvard University

**John Shea**, NBER and University of Maryland, "Does Parents' Money Matter?"

Discussant: Caroline M. Hoxby, NBER and Harvard University  
**Alan B. Krueger**, NBER and Princeton University, "Do Markets Respond More to More Reliable Labor Market Data? A Test of Market Rationality" (NBER Working Paper No. 5769) — See "Labor Studies Program Meeting" earlier in this section of the *NBER Reporter* for a description of this paper.)

Discussant: Owen Lamont, NBER and the University of Chicago

**Ben S. Bernanke** and **Michael Woodford**, NBER and Princeton University, "Inflation Forecasts and Monetary Policy"

Discussant: Lars E.O. Svensson, NBER and Stockholm University

**Alesina and Perotti** study how the composition of fiscal adjustments influences their likelihood of "success", defined as a long-lasting deficit

reduction, and their macroeconomic consequences. They find that fiscal adjustments which rely primarily on spending cuts on transfers and the

government wage bill have a better chance of being successful and are expansionary; fiscal adjustments which rely primarily on tax increases

and cuts in public investment tend not to last and are contractionary.

**Chari, Kehoe, and McGrattan** ask whether staggered price setting can generate persistent fluctuations in output following monetary shocks. They construct a business cycle version of a standard sticky price model in which imperfectly competitive firms set nominal prices in a staggered fashion. They assume that prices are exogenously sticky for a short period of time. They find the amount of endogenous stickiness to be small. As a result, such a model cannot generate persistent movements in output following monetary shocks.

**Mishkin** explains how a developing economy can shift dramatically from a path of reasonable growth before a financial crisis, as in the case in Mexico in 1994, to a sharp decline

in economic activity after a crisis. Using an asymmetric information framework, he shows why the banking sector is so important to the economy, particularly in developing countries, and he provides a rationale for bank regulation and supervision. The appropriate institutional structure is critical to preventing banking and financial crises in developing countries and to reducing their undesirable effects if they should occur.

**Shea** asks whether parents' income per se has a positive impact on children's human capital accumulation. He focuses on income variation attributable to factors that arguably represent luck: father's union status; industry status; and job loss because of "establishment death." He finds that changes in parents' income attributable to luck have at best a negligible impact on children's skills.

**Bernanke and Woodford** address the issue of existence and uniqueness of rational expectations equilibria when the central bank uses private-sector forecasts as a guide to policy actions. They show that strict targeting of inflation forecasts is typically inconsistent with the existence of rational expectations equilibria, and that policies approximating strict inflation-forecast targeting are likely to have undesirable properties. They also show that economies with more general forecast-based policy rules are particularly susceptible to multiple equilibria. They conclude that while private-sector forecasts may contain information useful to the central bank, ultimately the monetary authorities must rely on an explicit structural model of the economy to guide their policy decisions.

## Workshop on Behavioral Macroeconomics

NBER Research Associate Robert J. Shiller of Yale University and George A. Akerlof of the University of California, Berkeley, organized a workshop on behavioral macroeconomics which took place in Cambridge on November 16. The program was:

**Gil Mehrez**, Georgetown University, "Output, Employment, and Prices in an Economy with Adjustment Costs"

Discussant: Ricardo J. Caballero, NBER and MIT

**Robert J. Shiller**, "Why are People so Indifferent to Indexation?"

Discussant: Anil K. Kashyap, NBER and University of Chicago

**Eldar Shafir**, Princeton University, and **Amos Tversky**, "Thinking through Uncertainty: Nonconsequential Reasoning and Choice"

Discussant: John Geanakoplos, Yale University

**Carl Campbell**, Dartmouth College, and **Kunal Kamani**, IIT Corporation, "The Reasons

for Wage Rigidity: Evidence from a Survey of Firms"

Discussant: Truman Bewley, Yale University

**George A. Akerlof** and **William T. Dickens** and **George I. Perry**,

The Brookings Institution, "The Macroeconomics of Low Inflation" Discussant: Olivier J. Blanchard, NBER and MIT

**Mehrez** investigates the dynamics of output, employment, and prices in an economy with costs of adjusting labor and prices. He develops a model with infrequent price and labor adjustments. He derives the firms' multivariate distribution of prices and the deviation of employment from its optimal level and uses them to determine the dynamics of

the price level, aggregate employment, and aggregate output. He shows that in such an economy, money is not neutral.

**Shiller** presents and analyzes the results of informal interviews and formal questionnaire surveys of 274 people in the United States and Turkey to help understand why the general public appears not very inter-

ested in plans to manage consumer price index risk by indexation of contracts. He chooses Turkey for study because it has very high inflation, no legal barriers to indexation, and yet almost no indexation.

The paper by **Shafir** and **Tversky** notes that when thinking under uncertainty, people often do not consider appropriately each of the rele-

vant branches of a decision tree, as required by consequentialism. As a result, they sometimes violate "Savage's sure-thing principle." In the Prisoner's Dilemma game, for example, many subjects compete when they know that the opponent has competed and when they know that the opponent has cooperated, but cooperate when they do not know the opponent's response. The authors also interpret "Newcomb's Problem" and "Wason's selection task" as manifestations of nonconsequential decisionmaking and reasoning. They discuss the causes and implications of such behavior, and the notion of quasi-magical thinking.

**Campbell** and **Kamlani** conduct

a survey of 184 firms to discriminate among competing theories of wage rigidity. They find the strongest support for models in which effort depends on wages, and for the adverse selection model. In addition, reducing turnover appears to be an important explanation of wage rigidity, particularly for white-collar workers. Other significant findings are that respondents felt that wages had a greater impact on the effort of low-skilled workers than of high-skilled workers; that workers' effort was more affected by wage changes than by wage levels; and that effort responded more strongly to wage decreases than to wage increases.

**Akerlof** and his co-authors dem-

onstrate the prevalence of downward wage rigidity in the U.S. economy and model its significance for the economy's performance. Downward rigidity interferes with the ability of some firms to make adjustments in real wages, leading to inefficient reductions in employment. The authors estimate that the difference in the sustainable rate of unemployment between operating with a steady 3 percent inflation rate and with zero inflation is between 1 and 2.6 percentage points. Thus, they conclude that targeting zero inflation will lead to inefficient allocation of resources as reflected in a sustainable rate of unemployment that is unnecessarily high.

## Productivity Program Meeting

Around 35 members and guests of the NBER's Program on Productivity met in Cambridge on December 13 to discuss pricing and productivity in the health care industry. The meeting's organizers were David Cutler, NBER and Harvard University, and Ernst Berndt, NBER and MIT. The discussion centered around the following works in progress:

**Ernst Berndt; Iain M. Cockburn**, NBER and University of British Columbia; and **Richard Frank** and **Zvi Griliches**, NBER and Harvard University, "Price Indices for the Treatment of Depression"  
**Sara Ellison**, MIT, and **Judith Hellerstein**, NBER and University of Maryland, "Issues in Antibiotics Pricing"

**Iain M. Cockburn**, "Hedonic Analysis of Arthritis Drugs"

**David Cutler; Mark B. McClellan**, NBER and Stanford University; and **Joseph Newhouse**, Harvard University, "Prices and Productivity in Managed Care Insurance"

**Frank R. Lichtenberg**, NBER and Columbia University, "The Effect of Health Care Financing on the Practice of Outpatient Medicine"

**Scott Stern**, NBER and MIT, and **Manuel Trajtenberg**, NBER and Tel-Aviv University, "Calculating the Patient Welfare Benefits from Pharmaceutical Innovation"

The program concluded with a panel discussion on "Issues in

Accounting for Medical Sector Output and Prices." The panelists were: Dennis S. Fixler, Bureau of Labor Statistics; Jack E. Triplett, Bureau of Economic Analysis; Joseph Newhouse; and Zvi Griliches.

In addition to these authors and panelists, representatives of the pharmaceuticals industry; the U.S. Bureau of Labor Statistics — whose Consumer Price Index must depend, at least in part, on the accuracy of measurement of drug prices; and the National Institutes of Health, all joined in the discussion, along with other academic economists.

## Bureau Books

The following volumes may be ordered directly from the University of Chicago Press. Order Department, 11030 South Langley Avenue, Chicago, IL 60628-2215. 1-800-621-2736. Academic discounts of 10 percent for individual volumes and 20 percent for standing orders for all NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

### The Economics of New Goods

*The Economics of New Goods*, edited by Timothy F. Bresnahan and Robert J. Gordon, is now available from the University of Chicago Press for \$75.00. The eleven essays in this volume, which is part of the NBER's Series of Studies on Income and Wealth, analyze and discuss how to quantify the effects of new goods on economic well being. The various authors explore how to convert the broad notion that new goods improve human welfare into specific, quantitative ideas about measurable improvements in welfare. They also provide case studies of the problems encountered in the process.

Bresnahan is an NBER research

associate in the programs in industrial organization and productivity, and a professor of economics at Stanford University. Gordon is an NBER research associate in the programs in economic fluctuations and growth, productivity, and international finance and macroeconomics; he is also a professor of economics at Northwestern University

### The Economic Effects of Aging in the United States and Japan

*The Economic Effects of Aging in the United States and Japan*, edited by Michael D. Hurd and Naohiro Yashiro, is available from the University of Chicago Press for \$65.00. This book should be of interest to gerontologists and sociologists, as well as economists.

The volume is the result of a conference, cosponsored by the NBER and the Japan Center for Economic Research (JCER), which explored the similarities and differences in the effects of aging on the economies in the two countries. The essays, written by leading U.S. and Japanese specialists in the field of aging, point out that there will be substantial similarities between the countries; any differences will be more of degree than type, as a result of the different cultures and institutions.

Hurd is an NBER research associate in the program on aging and a

professor of economics at State University of New York, Stony Brook. Yashiro is a professor of economics at Sophia University and a senior economist at the JCER.

### The Effects of U.S. Trade Protection and Promotion Policies

*The Effects of U.S. Trade Protection and Promotion Policies*, edited by Robert C. Feenstra, will be available this spring from the University of Chicago Press for \$58.00. The twelve essays in this volume examine three main themes: trade and investment with Japan; the U.S. response to "unfair" trading practice; and industry- and country-specific trade policies. Among the interesting findings are that some policies can act simultaneously as import protection and export promotion; that the threat of protection often can be as effective as protection itself; and that domestic policy has as much effect on trade and investment as trade policy does.

This volume should be of interest to government policymakers in the area of trade, representatives of multinational businesses, and international economists. Feenstra, its editor, is an NBER research associate and director of the Bureau's Program of Research on International Trade and Investment. He is also a professor of economics at University of California, Davis.

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## Current Working Papers

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## NBER Working Papers

### The Long-Run U.S./U.K. Real Exchange Rate

Charles M. Engel and  
Chang-Jin Kim

NBER Working Paper No. 5777

September 1996

JEL No. F40

International Finance and  
Macroeconomics

We investigate the behavior of the long-run U.S./U.K. real exchange rate from 1885 to 1995. Our long-run real exchange rate series is derived from an unobserved components model that divides the real exchange rate into permanent and transitory components. The transitory component has variances that switch, according to a Markov process, among low-, medium- and high-variance states. The underlying assumptions of our time-series model are based on an economic theory in which the permanent component represents real influences, while the transitory component represents primarily short-run movements caused by fluctuations in the nominal exchange rate. Because the model is difficult to estimate by standard methods, we describe how the method of Gibbs sampling can handle this difficulty. We find that our long-run real exchange rate series moves similarly to other measures proposed in the literature based on economic models.

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Abstracts of all papers issued since September 1996 are presented below. For previous papers, see past issues of the *NBER Reporter*. Working Papers are intended to make results of NBER research available to other economists in preliminary form to encourage discussion and suggestions for revision before final publication. They are not reviewed by the Board of Directors of the NBER.

## **Children and their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size**

**Joshua D. Angrist and William N. Evans**

NBER Working Paper No. 5778

September 1996

JEL Nos. J0, J2

Labor Studies

Although theoretical models of labor supply and the family are well developed, there are few credible estimates of the key empirical relationships in the work-family nexus. This study uses a new instrumental variable, the sex of the first two children of families with two or more children, to estimate the effect of additional children on parents' labor supply. Instrumental variables estimates using the children's sex are substantial, but smaller than the corresponding ordinary least squares (OLS) estimates. Moreover, unlike the OLS estimates, there appear to be no effects on the female labor supply based on children's sex among more educated women and women with high-wage husbands. We also find that married women who have a third child reduce their labor supply by as much as women in the full sample, while there is no relationship between wives' childbearing and husbands' labor supply. Finally, we compare these results to estimates produced with twins as instruments. The estimates based on twins are very close to the estimates based on children's sex, once they are corrected for differences in the ages of the children. The estimates imply that the labor supply consequences of childbearing disappear by the time the child is about 13 years old.

## **Executive Compensation and the Optimality of Managerial Entrenchment**

**Gary B. Gorton and Bruce D. Grundy**

NBER Working Paper No. 5779

September 1996

JEL No. G13

Corporate Finance

Firms are more complicated than standard principal-agent theory allows: they have assets in place; they endure through time, allowing for the possibility of replacing a shirking manager; they have many managers, constraining the amount of equity that can be awarded to any one; and, a firm's owner can transfer some control to a manager, thereby entrenching him or her. Recognizing these characteristics, we solve for the vesting dates, wage, equity, and options components, and control rights of an optimal contract. Managerial entrenchment makes the promise of deferred compensation credible. Deferring compensation by delaying vesting reduces a manager's ability to free-ride on a replacement's effort.

## **Pension System Reform: The Mexican Case**

**Carlos Sales-Sarrapy, Fernando Solis-Soberón, and Alejandro Villagómez-Amezcu**

NBER Working Paper No. 5780

September 1996

Public Economics

This paper analyzes the Mexican pension reform of December 1995. Essentially, the reform substituted a defined-benefit pay-as-you-go system with a fully funded defined-contribution system based on individual accounts with a minimum pension guarantee provided by the government. Total contributions to the accounts will amount to 13.5 percent of salary for the average worker, plus 2.5 percent for disability and life

insurance that will still be managed by the government's Social Security Institute (IMSS). The new system, while sharing many common elements with other Latin American experiences, has some advantages and disadvantages over them. As an advantage, the new system completely substitutes for the old system; it reduces administrative costs by limiting the number of transfers between pension fund managers to one per year; pension managers are allowed to operate several funds; the law does not establish a minimum guaranteed rate of return for pension funds; and there is a centralized contributions collection agency. Among its disadvantages are the prohibition of funds from investing in foreign securities; the IMSS as the sole provider of disability and life insurance; the IMSS being able to operate as a pension fund manager; the housing subaccount offering low returns; limits on market share; and portability problems. Finally, the fiscal cost of the transition to the new system is relatively low compared to similar reforms in other Latin American countries, we find.

## **Child Support and Fathers' Remarriage and Fertility**

**David E. Bloom, Cecilia Conrad, and Cynthia Miller**

NBER Working Paper No. 5781

October 1996

JEL No. J1

Aging, Health Care, Labor Studies

We test the hypothesis that child support obligations impede remarriage among nonresident fathers. Hazard models fitted to data from the National Longitudinal Survey of Youth and from the Survey of Income and Program Participation reveal that child support obligations do deter remarriage among low-income nonresident fathers. The benefits to children of stricter child support enforcement thus are dimin-

ished by the negative effects of child support on remarriage, because a substantial share of nonresident fathers remarry and help to support women with children. Indeed, simple calculations based on our findings suggest that the financial benefits to children in single-parent families of improved enforcement may be offset substantially or completely by the negative effects of enforcement that operate indirectly through diminished remarriage. Our results provide no evidence that child support influences the nature of matches in the remarriage market, or the likelihood of subsequent fertility.

### **A Critical Assessment of the Role of Imperfect Competition in Macroeconomics**

**Dennis W. Carlton**

NBER Working Paper No. 5782

October 1996

JEL Nos. D43, E12, L16, O34

Economic Fluctuations and Growth, Industrial Organization

New Keynesian models and some models of growth rely on market power for their results. This sole focus on market power as the source for certain macroeconomic phenomena is misguided both theoretically and empirically. New Keynesian multipliers are related closely to standard measures of deadweight loss used in the public finance literature. The theoretical analysis shows that a standard competitive model with taxes exactly reproduces the multipliers in the new Keynesian models. The empirical evidence strongly suggests that taxes, not market power, will be the far more important influence on explaining short-run fluctuations in GNP. Theory and the empirical evidence suggest that the existence of intellectual property rights is likely to be a more important determinant of innovation than market power. Finally, I show how models that

incorporate the cost of marketmaking, durability and dynamic policies, and timing based on the option value of resolving uncertainty can yield more valuable insights into macroeconomic phenomena than models with market power.

### **DM-Dollar Volatility: Intraday Activity Patterns, Macroeconomic Announcements, and Longer-Run Dependencies**

**Torben G. Andersen and Tim Bollerslev**

NBER Working Paper No. 5783

October 1996

JEL Nos. C22, F31, G14, G15

Asset Pricing

We use an annual sample of five-minute returns to characterize the volatility in the DM-dollar foreign exchange market. Our approach explicitly captures the pronounced intraday activity patterns, the strong macroeconomic announcement effects, and the volatility persistence that are familiar from lower frequency returns. We quantify the different features separately and show that together they account for a substantial fraction of the realized return variability, both at the intradaily and the daily levels. Moreover, we demonstrate how the high frequency returns, when modeled properly, constitute an extremely valuable and vastly underutilized resource for better understanding the volatility dynamics at the daily or lower frequencies.

### **Do Nontraded Goods Explain the Home Bias Puzzle?**

**Paolo Pesenti and Eric van Wincoop**

NBER Working Paper No. 5784

October 1996

International Finance and Macroeconomics

Interpretations of the home bias puzzle in international finance frequently have focused on the role of fluctuations in domestic nontraded output, through their effects on the marginal utility of consumption of tradables. We assess the empirical relevance of this approach by deriving an explicit solution for the optimal international portfolio, and applying our model to a set of 14 OECD countries. Computing asset returns according to a "fundamentals" approach, we can account for an average gap of no more than 10–15 percentage points between estimated domestic ownership shares and domestic shares under full diversification. When stock market data are used directly, the predicted coefficient of home bias shrinks to 3 percent.

### **Linear Probability Models of the Demand for Attributes with an Empirical Application to Estimating the Preferences of Legislators**

**James J. Heckman and James M. Snyder, Jr.**

NBER Working Paper No. 5785

October 1996

JEL Nos. C25, D72, D78

Public Economics

We formulate and estimate a rigorously-justified linear probability model of binary choices of alternatives characterized by unobserved attributes. We apply the model to estimating the preferences of Congressmen as expressed in their

votes on bills. We find the effective dimension of the attribute space characterizing votes to be larger than what has been estimated in recent influential studies of Congressional voting by Poole and Rosenthal. Congressmen vote on more than ideology; issue-specific attributes are an important determinant of Congressional voting patterns. The estimated dimension is too large for the median voter model to describe Congressional voting.

### **Measuring Short-Run Inflation for Central Bankers**

**Stephen G. Cecchetti**

NBER Working Paper No. 5786

October 1996

JEL Nos. E31, E52

Monetary Economics

As central bankers intensify their focus on inflation as the primary goal of monetary policy, it becomes increasingly important to have accurate and reliable measures of changes in the aggregate price level. Measuring inflation is surprisingly difficult, as it involves two types of problems. Commonly used indexes, for example the Consumer Price Index (CPI), contain both transitory noise and bias. Noise causes short-run changes in measured inflation to reflect movements in long-run trends inaccurately, while bias leads the long-run average change in the CPI to be too high.

In this paper I propose methods of reducing both the noise and the bias in the CPI. Noise reduction is achieved by average monthly inflation in measures called "trimmed means" over longer horizons. Trimmed means are similar to medians calculated by ignoring the CPI components with extreme high and low changes each month, and averaging the rest. I find that using three-month averages halves the noise, while removing the highest and low-

est 10 percent of the cross-sectional distribution of inflation reduces the monthly variation in inflation by one-fifth.

### **Testing for the Fundamental Determinants of the Long-Run Real Exchange Rate: The Case of Taiwan**

**Hsiu-Ling Wu**

NBER Working Paper No. 5787

October 1996

JEL No. F3

This paper reports that the real exchange rates between the Taiwanese and the U.S. dollar did not move as PPP predicts, according to cointegration tests and analysis of the impulse response function. Also, through the analyses of impulse response functions, I find that innovation in the nominal exchange rate, domestic, and foreign prices results in permanent changes in the real exchange rate. Finally, in the long run, differential productivity growth between traded and nontraded goods, and changes in relative unit labor cost, can lead to changes in real exchange rates.

### **Buffer-Stock Saving and the Life Cycle/Permanent Income Hypothesis**

**Christopher D. Carroll**

NBER Working Paper No. 5788

October 1996

JEL Nos. D91, E21

Economic Fluctuations and Growth,  
Monetary Economics

This paper argues that saving by the typical household is described better by a "buffer-stock" version than by the traditional version of the Life Cycle/Permanent Income Hypothesis model. Buffer-stock behavior occurs if consumers with uncertainty about their income are sufficiently impatient. In the traditional model, consumption growth is

determined solely by tastes; in the buffer-stock model, consumers set their average consumption growth equal to the average growth of their labor income, regardless of tastes. The buffer-stock model can explain three empirical puzzles: the "consumption/income parallel" of Carroll and Summers; the "consumption/income divergence" first documented in the 1930s; and the stability of the household age/wealth profile over time, despite the unpredictability of idiosyncratic changes in wealth.

### **Speculative Attacks: Fundamentals and Self-Fulfilling Prophecies**

**Robert P. Flood and**

**Nancy P. Marion**

NBER Working Paper No. 5789

October 1996

We develop a modified "first-generation model" in order to better understand the 1994 Mexican peso crisis and aspects of the European currency crises in 1992-3. We introduce the assumption that the domestic monetary authority sterilizes the speculative attack; we incorporate a stochastic risk premium; and we allow for some price stickiness. The modified model shows that macroeconomic policies not consistent in the longer run with a fixed exchange rate inevitably can push the economy towards a currency crisis, but it also demonstrates how a government currently following consistent macroeconomic policies suddenly can face a speculative attack triggered by a large shift in speculative opinion. However, the ability of a sudden shift in speculative opinion to trigger an attack is limited by the position of fundamentals. Thus, an attack does not require a later change in policies to make it profitable.



## **Index Number and Factor Demand Approaches to the Estimation of Productivity**

**David H. Good, M. Ishaq Nadiri, and Robin C. Sickles**

NBER Working Paper No. 5790

October 1996

JEL Nos. O3, O4, L1, L6, L8

Productivity

We review a number of analytical methods and issues related to identifying and estimating the source of productivity growth. We also briefly discuss the two major methods used in measuring productivity growth: index numbers and econometric estimation. We examine a number of substantive issues, including the contribution of R and D capital and R and D spillovers, infrastructure capital, allocative distortions, the nature of the market structure, and technological advancement on productivity growth at various levels of aggregation. We describe the attributes of the static and dynamic factor demand models used to estimate the contribution of different inputs to productivity growth, and discuss the evaluation of changes in the production process changes in response to exogenous factors, and their impact on productivity growth. We also briefly note econometric issues and data considerations for proper estimation of the underlying structural models.

## **Current Account Sustainability: Selected East Asian and Latin American Experiences**

**Gian Maria Milesi-Ferretti and Assaf Razin**

NBER Working Paper No. 5791

October 1996

JEL Nos. F32, F34

International Finance and Macroeconomics

A number of developing countries have run large and persistent current

account deficits in both the late 1970s/early 1980s and in the early 1990s, raising the issue of whether these persistent imbalances are sustainable. This paper puts forward a notion of current account sustainability and compares the experience of three Latin American countries (Chile, Colombia, and Mexico) and three East Asian countries (Korea, Malaysia, and Thailand). We identify a number of potential indicators of sustainability and discuss their usefulness in predicting external crises.

## **Understanding Equilibrium Models with a Small and a Large Number of Agents**

**Wouter J. den Haan**

NBER Working Paper No. 5792

October 1996

JEL Nos. E21, E43, E44

Economic Fluctuations and Growth

In this paper, I compare a two-agent asset pricing model with a corresponding model with a continuum of agents. In a two-agent economy, interest rates respond to "idiosyncratic" income shocks because each agent represents half of the population. These interest rate effects facilitate consumption smoothing. However, an agent in a two-agent economy can never lend more than the other agent is allowed to borrow, which prevents the former from building a buffer stock of assets. For most parameter values, the first effect is more important. For some parameter values, the interest rate effects in the two-agent economy are so strong that a relaxation of the borrowing constraint reduces an agent's utility. In contrast to these differences, for most parameter values there are no large differences in average interest rates across the two types of economies. In addition, I analyze the business cycle behavior of interest rates in an economy with incomplete markets and a continuum of agents. The dynamic response of interest

rates to aggregate shocks is a lot more complicated than the response in an economy with complete markets, and the magnitude of the response is bigger.

## **Inflation and the Distribution of Price Changes**

**Michael F. Bryan and Stephen G. Cecchetti**

NBER Working Paper No. 5793

October 1996

JEL Nos. E31, C12

Monetary Economics

This paper reconsiders the empirical evidence connecting inflation to its higher order moments, and in particular, its third moment: the skewness of the price change distribution. Evidence on correlations between inflation and its moments goes back over 30 years, and was first used to reject the independence of relative price changes and inflation that is assumed in neoclassical models. More recently, New Keynesian macroeconomists have shown that the strong positive correlation between inflation and the skewness of the price change distribution is consistent with menu-cost models of price setting behavior. This is a fairly controversial result, prompting other researchers to demonstrate that the same correlation can be found in a multi-sector, flexible price (real business cycle) model.

We examine the small-sample properties of the main empirical finding on which this work is based: the positive correlation between the sample mean and sample skewness of price change distributions. Our results show that this particular statistic suffers from a large positive small-sample bias, and we demonstrate that the entirety of the observed correlation can be explained by this bias. To the extent that we find any relationship at all, it is that the correlation is negative. In

other words, we establish that one of the most accepted stylized facts in the literature on aggregate price behavior, that inflation and the skewness of the price change distribution are linked positively, need not be a fact at all.

### **A Tale of Two Crises: Chile and Mexico** **Sebastian Edwards**

NBER Working Paper No. 5794  
October 1996  
JEL Nos. E32, E31, F31  
International Trade and Investment,  
International Finance and  
Macroeconomics

The Mexican peso crisis of December 1994 sent shock waves through the world's financial and policy communities. What is to some extent surprising, however, is not that the Mexican economy faced a major currency crisis, but that so many analysts and observers were shocked by this turn of events. Mexico had a remarkable historical precedent: merely a dozen years earlier, Chile suffered a prophetically similar crisis. Like Mexico during the 1980s, Chile during the 1970s undertook major structural reforms characterized by a drastic opening of the economy, a sweeping privatization program, and a major deregulation effort aimed at creating a modern financial sector. In Chile, as in Mexico more than a decade later, the use of a predetermined exchange rate to eliminate inflation, combined with very large capital inflows that were intermediated by a weak banking system, generated a situation of exchange rate overvaluation, a vulnerable financial sector, and eventually the collapse of the currency.

This paper provides a comparative analysis of some macroeconomic aspects of the Chilean and Mexican crises. The discussion emphasizes a question of increasing concern in academic circles: to what extent are

exchange-rate-based stabilization programs successful in reducing, or even eliminating, inflationary inertia? The paper provides a brief overview of the Chilean and Mexican reform and stabilization programs initiated in 1975 and 1985. I develop a theoretical model on the effects of exchange-rate-based stabilization programs on inflationary inertia. The model emphasizes the roles of government preferences and credibility. I use detailed data on Chile and Mexico to assess whether these programs affected the time-series properties of inflation; more specifically, I investigate whether they reduced inflationary inertia.

### **Star Scientists, Institutions, and the Entry of Japanese Biotechnology Enterprises** **Michael R. Darby and Lynne G. Zucker**

NBER Working Paper No. 5795  
October 1996  
JEL No. O31  
Productivity

Advance of science and its commercial applications are in a close, symbiotic relationship in the U.S. biotechnology industry. Comparing Japan and the United States, the structure of the science appears broadly similar, but the organization of the biotechnology industry is quite dissimilar. In the United States, some 77 percent of new biotechnology enterprises (NBEs) were dedicated new biotechnology firms (NBFs), started for this purpose, while 88 percent of Japanese biotech firms in our database were subunits of existing firms (NBSs). We report estimates of the relation of NBE births in Japan to top-producing "star" scientists and other variables. While a similar process is at work in Japan and America, stars in Japan induce entry of significantly fewer NBEs than in the United States, and preexisting economic activity plays a greater

role. We find no such significant difference for entry of keiretsu-member and nonmember firms within Japan. We relate the significant Japan-U.S. differences to Japan's relatively compact geography and institutional differences between the higher education and research funding systems, the venture capital and IPO markets, cultural characteristics and incentive systems that affect scientists' entrepreneurialism, and tort liability exposures. The relative importance of these factors, and whether differences in organization of biotechnology result in substantial differences in productivity and international competitiveness, are issues for future research.

### **Paying for Health Insurance: The Tradeoff Between Competition and Adverse Selection**

**David M. Cutler and Sarah Reber**  
NBER Working Paper No. 5796  
October 1996  
Health Care, Public Economics

This paper uses data on health insurance choices by employees of Harvard University to examine the effect of alternative pricing rules on market equilibrium. In the mid-1990s, Harvard moved from a system of subsidizing more expensive insurance to a system of contributing an equal amount to each plan. We estimate a substantial demand response to the policy change, with a short-run elasticity of about -2. The reform also induced substantial adverse selection: because of this, the long-run demand response is three times the short-run response. Price variation induced by adverse selection is inefficient; we estimate the magnitude of the welfare loss from adverse selection at 2 percent of baseline health spending. Finally, as insurance choice was made more competitive, premiums to Harvard fell relative to premiums in the Boston area by nearly 10 per-

cent. This savings was large enough to compensate for the inefficiency induced by adverse selection, so that overall, reform was welfare enhancing.

### **Inflation Forecast Targeting: Implementing and Monitoring Inflation Targets**

**Lars E. O. Svensson**

NBER Working Paper No. 5797

October 1996

JEL Nos. E42, E52, E58

International Finance and

Macroeconomics, Monetary Economics

Inflation targeting implies inflation forecast targeting: the central bank's inflation forecast becomes an explicit intermediate target. Inflation forecast targeting simplifies both the implementation and the monitoring of monetary policy. The weight on output stabilization determines how quickly the inflation forecast is adjusted towards the inflation target. Money growth or exchange rate targeting is generally inferior to inflation targeting, and leads to higher variability of inflation. Commitment to "target rules" may be more effective than commitment to "instrument rules."

### **Convergence and International Factor Flows in Theory and History**

**Alan M. Taylor**

NBER Working Paper No. 5798

October 1996

JEL Nos. F02, F43, O41, N10

Development of the American Economy

Standard neoclassical growth models rarely admit that there is international factor mobility: convergence may result from factor accumulation in a closed economy, or from technology transfer. Thus, conventional models are poorly equipped to explain the contribution of international factor flows to con-

vergence in history. I develop a general model with many goods and multiple mobile and fixed factors. In response to recent historical research, I study a four-factor case, with labor, capital, and resources as potentially mobile factors, and land as a fixed factor. I then explore the model in the context of recent historical analyses of the sources of long-run convergence and divergence.

### **Australia's Retirement Income System: Implications for Saving and Capital Markets**

**Malcolm Edey and John Simon**

NBER Working Paper No. 5799

October 1996

JEL Nos. E21, G23, G28, H55, O56

Public Economics

Australia is in the early stages of introducing a system of self-provision for retirement through mandatory contributions to private superannuation funds. For most employees, the scheme eventually will replace, either fully or partially, the government age pension, which is currently relied upon by a large majority of retirees. The scheme has been implemented reasonably smoothly by building on existing financial infrastructure for voluntary superannuation. This paper summarizes the historical background of mandatory superannuation in Australia, reviews its potential impact on saving and capital markets, and highlights some remaining policy issues. Perhaps the most important of these is the impact of the system on retirement decisions. A number of features of the system contribute to incentives favoring early retirement and continued reliance on the government pension. Also important is the increasing complexity of the system, a result of the layering of rule changes and the grandfathering of existing rights at each stage of the process.

### **Are Knowledge Spillovers International or Intranational in Scope? Microeconomic Evidence from the U.S. and Japan**

**Lee G. Branstetter**

NBER Working Paper No. 5800

October 1996

JEL Nos. O14, F12

International Trade and

Investment, Productivity

In a number of theoretical models, technological externalities can generate multiple equilibriums in the global pattern of specialization and trade, with different consequences for the relative welfare of the trading countries. In such models, temporary government policies can have lasting effects by pushing the global economy into a particular equilibrium. However, the prediction of multiple equilibriums generally hinges on the assumption that the technological externalities are *intranational* rather than international in scope.

In this paper, I point out important shortcomings in previous attempts to estimate the effects of intranational and international knowledge spillovers. Then, I provide new estimates of the relative impact of intranational and international knowledge spillovers on innovation and productivity at the firm level, using previously unexploited panel data from the United States and Japan which provide a rich description of the firms' technological activities and allow for potentially much more accurate measurement of spillover effects.

My estimates indicate that knowledge spillovers are primarily *intranational* in scope, providing empirical confirmation of a crucial assumption in much of the theoretical literature. This finding has important implications for the theoretical literature and the public debate on "strategic trade policy."

## **International R and D Spillovers, Trade, and Productivity in Major OECD Countries**

**M. Ishaq Nadiri and Seongjun Kim**

NBER Working Paper No. 5801  
October 1996

JEL Nos. F41, F43, O31, O47, O57  
Productivity

In this paper we: 1) estimate the effects of international R and D spillovers on total factor productivity growth in the seven largest industrialized countries; 2) analyze the effect of spillovers on the structure of production, that is on the demand for factors including labor and investment, and on the supply of output; 3) examine the effect of technological transfers on the pattern of trade, that is, on imports and exports and; 4) calculate the private rates of return on physical capital and R and D investment, as well as the social rates of return on foreign R and D spillovers. To achieve our objectives, we develop a framework that integrates several strands of the available approaches in the literature: the GNP function approach suggested by Burgess (1974) and Kohli (1978); the spillover models proposed by Bernstein and Nadiri (1988), Bernstein and Mohnen (1994), Coe and Helpman (1995), and Park (1995); and the familiar interrelated factor demand and cost models.

## **What Happens within Firms? A Survey of Empirical Evidence on Compensation Policies**

**Canice Prendergast**

NBER Working Paper No. 5802  
October 1996

JEL No. J3  
Labor Studies

This paper provides an overview of empirical work on the compensation policies of firms. I consider the

literature from the perspective of three major theories: human capital; learning; and incentives. Our understanding of the effect of compensation on behavior and of firms' motivations in choosing certain policies has been constrained up until now by two important problems. First, the absence of data on contracts and performance has limited the ability of researchers to ask even the most basic question: do incentives matter? Second, the available theoretical work has not been oriented sufficiently towards distinguishing among plausible alternatives, so that many observed facts are consistent with any of the major theories.

## **Effort, Wages and the International Division of Labor**

**Edward E. Leamer**

NBER Working Paper No. 5803  
October 1996

JEL Nos. F11, J22, J31  
International Trade and Investment

This paper embeds variable effort into a traditional multi-sector model. Effort enters a production function (like total factor productivity) and, on the assumption that effort doesn't affect capital depreciation, the capital-cost savings from high effort operations are passed on to workers. The labor market thus offers a set of contracts with higher wages compensating for higher effort. Among the implications of the model are: 1) The capital savings from effort are greatest in the capital-intensive sectors, where the high-effort high-wage contracts occur. 2) Communities of industrious workers have high returns to capital and comparative advantage in capital-intensive goods. 3) Capital accumulation in a closed economy causes reductions in effort; capital accumulation in an open economy creates new high-wage high-effort jobs and higher effort levels. 4) Price declines of labor inten-

sive goods twist the wage-effort offer curve, lowering the compensation for low-effort work but increasing the reward for hard work. 5) A deterioration in the terms of trade causes an economy-wide reduction in effort. 6) A minimum wage does not cause unemployment. It forces effort in local services up high enough to support the higher wage. This acts like an increase in labor supply which increases the return on capital. A minimum wage, by forcing greater effort, increases GDP and reduces earnings inequality, but it makes workers worse off, since they prefer the contracts offered by the free market.

## **Sticky Price and Limited Participation Models of Money: A Comparison**

**Lawrence J. Christiano, Martin S. Eichenbaum, and Charles L. Evans**

NBER Working Paper No. 5804  
October 1996

JEL Nos. E3, E5  
Economic Fluctuations and Growth,  
Monetary Economics

This paper provides new evidence that models of the monetary transmission mechanism should be consistent at least with the following facts: in response to a contractionary monetary policy shock, the aggregate price level responds very little; aggregate output falls; interest rates initially rise; real wages decline, although by a modest amount; and profits fall. We argue that neither sticky price nor limited participation models can account convincingly for these facts. The key failing of the sticky price model is that it implies that profits rise after a contractionary monetary policy shock. This finding is robust to a variety of perturbations of the benchmark sticky price model that we consider. In contrast, the limited participation model can account for all of the facts mentioned earlier. But

it can do so only if one is willing to assume a high labor supply elasticity (for example, 2) and a high average markup (40 percent). The shortcomings of both models reflect the absence of other frictions, such as wage contracts, which dampen movements in the marginal cost of production after a monetary policy shock.

### **Does Head Start Help Hispanic Children?**

**Janet Currie and  
Duncan Thomas**

NBER Working Paper No. 5805

October 1996

JEL Nos. I38, I28

Labor Studies, Well-Being of Children

Poor educational attainment is a persistent problem among Latino children, relative to non-Latinos. This paper examines the effects of participation in the Head Start program on Latinos. We find that large and significant benefits accrue to Head Start children when we compare them to siblings who did not participate in the program. On average, Head Start closes at least one quarter of the gap in test scores between Latino children and non-Hispanic white children, and two thirds of the gap in the probability of grade repetition. Latinos are not a homogenous group, and we find that the benefits of Head Start are not distributed evenly across subgroups. Relative to siblings who attend no preschool, children of Mexican origin and children of native-born mothers, especially those whose mothers have more human capital, gain most from Head Start. In contrast, Latino children whose mothers are foreign-born and Puerto Rican children appear to reap little benefit from attending Head Start, relative to their siblings.

### **Sources of Convergence in the Late Nineteenth Century**

**Alan M. Taylor**

NBER Working Paper No. 5806

October 1996

JEL Nos. F02, F43, O41, N10

Development of the American Economy

Although the empirical growth literature has yielded many findings on postwar convergence patterns, it has had little to say about the determinants of convergence in earlier epochs. This paper investigates convergence for the Group-of-Seven countries during 1870–1914, the last great phase of global convergence before the present postwar era. The Augmented Solow Model, which includes physical and human capital accumulation, proves unsatisfactory in this setting. Its shortcomings appear to lie in a failure to control for changes in land endowments, a feature of the endogenous frontier dynamics of the period. I propose an alternative neoclassical open-economy factor accumulation model, which admits capital and labor migration, and may be extended to include a moving frontier. The model explains the observed convergence pattern in the sample, and suggests that factor accumulation patterns were the prime sources of labor productivity convergence from 1870 to 1914. The analysis gives little role to human capital, trade, or technological catch-up as important convergence mechanisms in this group of countries during the era studied. Since factor accumulation was influenced heavily by factor migration in the late nineteenth century, the findings also point to the limited use of conventional closed-economy growth models in this historical setting.

### **The Effect of Teen Childbearing and Single Parenthood on Childhood Disabilities and Progress in School**

**Joshua D. Angrist and  
Victor Lavy**

NBER Working Paper No. 5807

October 1996

JEL Nos. J12, J13

Labor Studies, Well-Being of Children

Teen and out-of-wedlock childbearing often are thought to be responsible for poor health and low levels of schooling among the children of young mothers. This paper uses special disability and grade repetition questions from the school enrollment supplement to the 1992 Current Population Survey (CPS) to estimate the effect of maternal age and single parenthood on children's disability status and school progress. Our results suggest that there is little association between maternal age at birth and children's disabilities. But the children of teen mothers are much more likely to repeat one or more grades than other children, and within-household estimates of this relationship are even larger than ordinary-least-squares estimates. We replicate the grade repetition findings from the CPS using a smaller sample from the National Longitudinal Survey of Youth. Another finding of interest is that having a father in the household is associated with lower prevalence of disability and fewer grade repetitions. But many of the effects of single parenthood on disability, as well as the effect on grade repetition, appear to be explained by higher incomes in two-parent families.

## **Firm Heterogeneity, Jobs, and International Trade: Evidence from Chile**

**James A. Levinsohn**

NBER Working Paper No. 5808

October 1996

JEL No. F14

International Trade and Investment

This paper is about jobs and international trade. It is also about what researchers can learn about the relationship between the two using firm-level data. And, it is about the particular experience of Chile following a broad trade liberalization, and spanning a significant macroeconomic contraction and expansion. Finally, this paper is about discerning patterns in the data that might later influence how international economists model the interaction between international trade and employment.

## **Sticky Price Models of the Business Cycle: Can the Contract Multiplier Solve the Persistence Problem?**

**V. V. Chari, Patrick J. Kehoe, and Ellen R. McGrattan**

NBER Working Paper No. 5809

October 1996

JEL Nos. E32, E52

Economic Fluctuations and Growth, Monetary Economics

In this paper, we construct a quantitative equilibrium model with price setting, and ask whether staggered price setting can generate persistent fluctuations in output following monetary shocks. Our business cycle version of a standard sticky price model allows imperfectly competitive firms to set nominal prices in a staggered fashion. We assume that prices are exogenously sticky for a short period of time. Persistent fluctuations in output require endogenous price stickiness, in the sense that firms choose not to change prices very much even when they can do so. We find little

endogenous stickiness. As a result, such a model cannot generate persistent movements in output following monetary shocks.

## **Balance Sheets, Multinational Financial Policy, and the Cost of Capital at Home and Abroad**

**Rosanne Altshuler and Harry Grubert**

NBER Working Paper No. 5810

October 1996

Public Economics

We use data from the balance sheets of controlled foreign corporations (CFCs) to study the real and financial behavior of U.S. multinational corporations. The previous literature on repatriations for the most part has been restricted to the choice between dividend distributions to the parent and further real investment in the CFC. The balance sheet data allows us to study a broader range of financial flows between CFCs and parents. Our theoretical work considers models that depart from the previous work in several important ways. We drop the standard arbitrage condition in which the aftertax return to equity and debt is equalized on the margin, and instead impose a worldwide financial constraint consistent with a rising cost of debt finance. In our model, parents can borrow against financial assets held abroad, and may allocate debt across locations to achieve the lowest cost of capital at home and abroad. We also consider the implications of models in which CFCs can invest in CFCs in other foreign countries. We explain how low-tax CFCs can repatriate tax-free by investing in high-tax CFCs that are repatriating income to parent corporations.

Our theoretical results confirm that financial assets, including the equity or debt of other CFCs, are attractive alternatives to repatriation and invest-

ment in real assets. We show that if the parent can borrow against its CFC's financial assets, it can achieve the equivalent of a dividend repatriation. Our regression results confirm the importance of tax considerations in explaining CFC holdings of financial assets. Low-tax CFCs invest in financial assets, particularly the debt and equity of related CFCs, in order to avoid residual U.S. taxes on repatriations. CFCs in high-tax locations are much more highly leveraged than low-tax CFCs. We also find that CFCs with more debt distribute more dividends. This shows that greater dividend distributions do not necessarily imply lower real investment by CFCs.

## **The Chilean Pension Reform: A Pioneering Program**

**Sebastian Edwards**

NBER Working Paper No. 5811

November 1996

Public Economics

In the mid-1970s, Chile initiated a deep, market-oriented reform program aimed at opening up the economy, privatizing state owned enterprises, and stabilizing the macroeconomy. In the 1980s Chile began to grow at increasingly rapid rates, becoming a star performer: between 1986 and 1995 the average rate of growth bordered 7 percent. Perhaps one of the most admired aspects of the Chilean program has been the reform of the pension system, which replaced an inefficient pay-as-you-go system with a privately administered defined contribution system. This reform has been credited with helping to develop Chile's capital market, with reducing government contingent liabilities, and with helping boost Chile's traditionally anemic savings rate. In this paper, I analyze the most salient aspects of the Chilean program and evaluate its achievements to date. The paper provides a brief back-

ground of the Chilean reforms and describes the old pay-as-you-go system, including its degree of (in)efficiency, its distributive characteristics, and its fiscal consequences. I discuss in detail the functioning of the new privately managed system, and evaluate the system's results up to date. I also discuss transitional issues, including the fiscal consequences of the reforms. Finally, the analysis deals with the effects of the reforms on labor markets and savings.

## **The Productivity of Nations**

**Robert E. Hall and  
Charles I. Jones**

NBER Working Paper No. 5812

November 1996

JEL Nos. E23, O47

Economic Fluctuations and  
Growth, Productivity

Why does output per worker vary enormously across countries? Our analysis shows that differences in governmental, cultural, and natural infrastructure are important sources of this variation. According to our results, a high-productivity country: 1) has institutions that favor production over diversion; 2) is open to international trade; 3) has at least some private ownership; 4) speaks an international language; and 5) is located in a temperate latitude far from the equator. A favorable infrastructure helps a country both by stimulating the accumulation of human and physical capital and by raising its total factor productivity.

## **Alternative Insurance Arrangements and the Treatment of Depression: What are the Facts?**

**Ernst R. Berndt, Richard G. Frank, and Thomas G. McGuire**

NBER Working Paper No. 5813

November 1996

JEL No. I11

Health Care, Health Economics,  
Productivity

Using insurance claims data from nine large self-insured employers offering 26 alternative health benefit plans, we empirically examine how the composition and utilization of treatments for depression vary under alternative organizational forms of insurance — indemnity, preferred provider organization networks (PPOs), and mental health carve-outs — and with variations in patient cost sharing, including copayments for psychotherapy and for prescription drugs.

Although total outpatient mental health/substance abuse expenditures per treated individual do not vary significantly across the many forms of insurance, the depressed outpatient is more likely to receive antidepressant drug (ADD) medications in PPOs and carve-outs than under indemnity insurance. Those individuals with higher copayments for psychotherapy also are more likely to receive ADD medications. For those receiving ADD treatment, increases in prescription drug copay tend to increase the share of ADD medication costs accounted for by the newest (and more costly) generation of drugs, the selective serotonin reuptake inhibitors.

## **Financial and Capital Account Liberalization in the Pacific Basin: Korea and Taiwan during the 1980s**

**Menzie D. Chinn and  
William F. Maloney**

NBER Working Paper No. 5814

November 1996

JEL Nos. F32, F34, F4

International Finance and  
Macroeconomics

This paper presents an alternative method of testing for financial capital mobility in the absence of forward exchange markets. We apply a model of domestic interest rate determination during liberalization to Korean

and Taiwanese data. We use a variety of diagnostic and recursive tests to isolate structural breaks in the data. We show that Korean interest rates behave as if they were determined domestically until late 1988 or early 1989, while Taiwanese rates exhibit this behavior until early 1989. Thereafter, these economies' interest rates appear to be linked tightly to the Euroyen rate. These results contrast with those obtained by Reisen and Yeches (1993) which indicated a single opening and closing for Korea, and no structural break for Taiwan. They also differ from those results of Jwa (1994), indicating two temporary openings for Korea. Greater integration of these domestic markets with world financial markets suggests that it will be more difficult for these countries to stabilize their economies in the face of capital inflows and outflows.

## **The Taxation of Pensions: A Shelter Can Become a Trap**

**John B. Shoven and  
David A. Wise**

NBER Working Paper No. 5815

November 1996

JEL No. H2

Aging, Public Economics

Pensions often are thought to be attractive tax shelters that encourage saving for retirement. They allow people to save before-tax dollars and to compound investment returns without current taxation. However, the taxation of pension assets as they are distributed in retirement, or as they pass through an estate, may turn the shelter into a trap, at least for large pension accumulations. Pension distributions can face marginal tax rates as high as 61.5 percent; pension assets passing through an estate can face virtually confiscatory marginal tax rates between 92 and 99 percent. This paper shows the circumstances under which these extraordinarily

high marginal tax rates will be encountered. They are not limited to the rich. In fact, people of modest incomes who participate in a pension plan over a long career may face such rates. The paper presents a comprehensive examination of the taxation of pensions and discusses the optimal responses of households to the incentives created by the tax system.

### **The Econometrics of Ultra-High Frequency Data**

**Robert F. Engle**

NBER Working Paper No. 5816

November 1996

Asset Pricing

Ultra-high frequency data are complete transactions data that inherently arrive at random times. Marked point processes provide a theoretical framework for analysis of such datasets. The ACD model that I developed with Russell (1995) is applied to IBM transactions data to develop semi-parametric hazard estimates and measures of instantaneous conditional variances. The variances are influenced negatively by surprisingly long durations as suggested by some of the market micro-structure literature.

### **Private and Public Supply of Liquidity**

**Bengt R. Holmstrom and Jean Tirole**

NBER Working Paper No. 5817

November 1996

JEL Nos. D21, E62, G32

Corporate Finance

This paper addresses a basic yet unresolved question: do claims on private assets provide sufficient liquidity for the productive sector to function efficiently? Or, does the state have a role in creating liquidity and regulating it, either through adjustments in the stock of government securities or by other means?

In our model, firms can meet future liquidity needs in three ways: by issuing new claims and diluting old ones; by obtaining a credit line from a financial intermediary; and by holding claims on other firms. When there is no aggregate uncertainty, these instruments are sufficient for attaining the socially optimal (second-best) contract between investors and firms. Such a contract imposes both a maximum leverage ratio and a liquidity constraint on firms. Intermediaries coordinate the use of liquidity. Without intermediation, scarce liquidity may be wasted and the social optimum may not be attainable.

When there is only aggregate uncertainty, the private sector is no longer self-sufficient in terms of liquidity. The government can improve liquidity by issuing bonds that commit future consumer income. Government bonds command a liquidity premium over private claims. The supply of liquidity can be managed by loosening liquidity (boosting the value of its securities) when the aggregate liquidity shock is high and tightening liquidity when the shock is low. Thus this paper provides a microeconomic example of government supplied liquidity as well as of the possibility of active government policy.

### **The Myth of the Patient Japanese: Corporate Myopia and Financial Distress in Japan and the United States**

**Brian J. Hall and David E. Weinstein**

NBER Working Paper No. 5818

November 1996

Productivity

It is widely believed that the stock market-oriented U.S. financial system forces corporate managers to behave myopically relative to their Japanese counterparts, who operate in a bank-

based system. We hypothesize that if U.S. firms are more myopic than Japanese firms, then episodes of financial distress (when myopia should be most pronounced) should cause U.S. firms to decrease their R and D spending (our main proxy for long-term investment) more than Japanese firms would. We find no evidence that this is the case. In addition, we show that Japanese firms do not invest more than U.S. firms after the onset of distress. Our results hold even when we compare U.S. firms to Japanese "group" firms, which have close financial ties to their banks and are thought to be the least myopic (and the most able to weather distress). The results also withstand a variety of robustness checks. Our findings that U.S. and Japanese firms respond similarly to financial distress cast doubt on the view that U.S. managers are more short-sighted than their Japanese counterparts.

### **The Underreaction Hypothesis and the New Issue Puzzle: Evidence from Japan**

**Jun-Koo Kang, Yong-Cheol Kim, and René M. Stulz**

NBER Working Paper No. 5819

November 1996

Asset Pricing, Corporate Finance

We investigate the long-term performance of Japanese firms that issue convertible debt or equity. We find that these firms perform poorly even though the stock-price reaction to announcements of convertible debt and equity issues is not significantly negative for Japanese firms, and Japanese firms do not issue equity or convertible debt following strong positive abnormal returns. Whereas underperformance in the United States appears to be concentrated in the smaller firms and in firms with a high market-to-book ratio, this is not the case in Japan. The underperformance of Japanese issuing firms



cannot be understood in terms of the underreaction hypothesis that some have advanced as an explanation for the poor returns of U.S. issuing firms.

### **The Changing Structure of Cost and Demand for the U.S. Telecommunications Industry**

**M. Ishaq Nadiri and Banani Nandi**

NBER Working Paper No. 5820

November 1996

JEL Nos. L5, L7, O3, O32

Productivity

We formulate a multiproduct structural model to examine the evolution of the structure of production and demand, and the dynamic interaction between the two, in the context of the U.S. telecommunications industry over an extended period, from 1935 to 1987. We estimate the degree of scale economies, cost elasticities, input price elasticities, and the determinants of output demand. We also examine the contribution of the quasi-fixed inputs, such as R and D and physical capital, in the evolution of this industry. Using our analytical framework and a long sample period, we examine under different economic conditions, market structures, and regulatory environments a number of important issues, such as the stability of the cost and demand structure over time, the changing characteristics of demand for local and toll services, and the variation of price-cost margin over time. Use of this approach makes it possible to analyze the effects of the 1984 divestiture of the Bell System on the cost structure, employment, and capital formation of the telecommunications industry in the United States.

### **Inflation, Real Interest Rates, and the Bond Market: A Study of United Kingdom Nominal and Index-Linked Government Bond Prices**

**David G. Barr and John Y. Campbell**

NBER Working Paper No. 5821

November 1996

JEL Nos. E31, E43

Asset Pricing, Monetary Economics

We estimate expected future real interest rates and inflation rates from observed prices of U.K. nominal and index-linked government bonds. Our estimation method takes account of imperfections in the indexation of U.K. index-linked bonds. It assumes that expected log returns on all bonds are equal, and that expected real interest rates and inflation follow simple time-series processes whose parameters can be estimated from the cross-section of bond prices. The extracted inflation expectations forecast actual future inflation more accurately than nominal yields do. The estimated real interest rate is highly variable at short horizons, but comparatively stable at long horizons. Changes in real rates and expected inflation are strongly negatively correlated at short horizons, but not at long horizons.

### **What We Know and Do Not Know about the Natural Rate of Unemployment**

**Olivier J. Blanchard and Lawrence F. Katz**

NBER Working Paper No. 5822

November 1996

JEL Nos. E20, E30, J60

Economic Fluctuations and Growth, Labor Studies

Over the past three decades, a large amount of research has attempted to identify the determinants of the natural rate of unemployment. We assess this body of

work in this paper and reach two main conclusions: 1) there has been considerable theoretical progress over the past 30 years. A framework has emerged which we present, showing how it can be used to think about the relation between technological progress and unemployment, for example. 2) Empirical knowledge lags behind. Economists do not have a good quantitative understanding of the determinants of the natural rate, either across time or across countries. We study two particular issues, the relation of wages to unemployment and the rise of European unemployment.

### **Changes in Wage Inequality, 1970–1990**

**Jacob Mincer**

NBER Working Paper No. 5823

November 1996

Labor Studies

Differences in wages between skill groups declined in the 1970s and rose in the 1980s, but aggregate wage inequality grew throughout the period. This divergence remains a puzzle in recent studies of U.S. wage inequality. In this paper, I use the human capital approach to explain the sometimes divergent paths of intergroup and intragroup inequality. With this approach, wages are the return on cumulated investments in human capital. In turn, interpersonal distributions of investments and their marginal rates of return are determined by individual supply and demand curves. Recent studies have shown that relative growth of the supply of human capital in the 1970s and of demand in the 1980s generated the U-shaped time pattern of ("between group") skill differentials. This paper shows that a widening of the dispersion among individual demand curves started in the 1970s and generated a continuous expansion of ("within group") residual wage inequality. The widening dis-

person in demand curves reflects a growing skill bias in the demand for labor. Aggregate inequality grew throughout the period, because within-group inequality accounts for the larger part of total inequality. The data also indicate that wage inequality grew in the face of stability in the dispersion of human capital, and despite the likely decline in inequality of opportunity, as reflected in the decline in dispersion among supply curves.

### **Liberalization of Capital Flows in Korea: Big Bang or Gradualism?**

**Dongchul Cho and  
Youngsun Koh**

NBER Working Paper No. 5824  
November 1996  
JEL Nos. F4, F2, E6

Capital market liberalization has become an irreversible trend in Korea since 1992. With the current level of high interest rates in Korea, however, drastic full-scale liberalization certainly would attract a large amount of capital inflows and cause the Korean won to appreciate. This would affect the price competitiveness of Korean products in international markets, which could bring about significant macroeconomic instability in an economy like Korea's that relies heavily on external transactions. Through simulations using a macro-model based on neoclassical long-run convergence and Keynesian short-run dynamics, we attempt to provide some quantitative assessments of several alternative policy choices including the speed of liberalization.

### **New Activities, the Welfare Cost of Uncertainty, and Investment Policies**

**Joshua Aizenman**

NBER Working Paper No. 5825  
November 1996  
JEL Nos. F12, F21, F23  
International Trade and Investment

This paper analyzes the effect of policy uncertainty on the formation of new activities in a Romer (1994)-type economy, in which the productivity of labor increases with the number of capital goods. Adding a new capital good requires a capital-specific setup cost, undertaken prior to using the capital good. Agents are averse to disappointment, putting greater utility weight on downside risk [as modeled by Gul (1991)]. Policy uncertainty is induced by "revenue seeking" administrations, which tend to tax the "quasi fixed" capital and ignore long-term costs. Disappointment aversion implies that investment, labor, and capitalists' income drop at a rate proportional to the standard deviation of the tax rate. Hence, policy uncertainty induces *first-order* adverse effects, but also leads to *second-order* effects when consumers maximize the conventional expected utility. The adverse effects of policy uncertainty can be overcome partially by a proper investment policy. This paper interprets the tax concessions granted to multinationals as a commitment device that helps to overcome the adverse implications of policy uncertainty.

### **Taxation and Economic Growth**

**Eric M. Engen and  
Jonathan S. Skinner**

NBER Working Paper No. 5826  
November 1996  
Public Economics

Tax reforms sometimes are touted to have strong macroeconomic growth effects. Using three ap-

proaches, we consider the impact of a major tax reform on the long-term growth rate of the U.S. economy. First we examine the historical record of the U.S. economy to evaluate whether tax cuts have been associated with economic growth. Second we consider the evidence on taxation and growth for a large sample of countries. Finally, we use evidence from micro-level studies of labor supply, investment demand, and productivity growth. Our results suggest modest effects, on the order of 0.2 to 0.3 percentage point differences in growth rates in response to a major tax reform that changes all marginal tax rates by 5 percentage points and average tax rates by 2.5 percentage points. Nevertheless, even such small effects can have a large cumulative impact on living standards.

### **Trade Reform with a Government Budget Constraint**

**James E. Anderson**

NBER Working Paper No. 5827  
November 1996  
JEL Nos. H21, F13  
International Trade and Investment

The standard theory of trade reform uses a passive government budget constraint, in which changes in tariff revenue are offset by changes in lump sum transfers. This paper offers a general framework for the analysis of trade reform when the government budget constraint is active, meaning that tariff revenue cuts must be offset by distortionary changes in fiscal policy: cuts in the supply of public goods or alternative tax increases. Useful and simple new expressions characterizing welfare-improving trade reform compare the marginal cost of funds (MCF) of trade taxes with the MCF of consumption taxes. The MCF expressions provide an intuitive index number that is operational with computable general equilibrium models. The theoretical

analysis and an application to Korean data in 1963 both cast doubt on the desirability of tariff cuts in convex competitive economies with active government budget constraints.

### **Institutions and Labor Reallocation**

**Giuseppe Bertola and Richard Rogerson**

NBER Working Paper No. 5828

November 1996

JEL Nos. J31, J63

Economic Fluctuations and Growth

Despite stringent restrictions on dismissal in most European countries, rates of job creation and destruction are remarkably similar across European and North American labor markets. This paper shows that relative-wage compression is conducive to higher employer-initiated job turnover. We argue that wagesetting institutions and job-security provisions differ across countries in ways that are both consistent with rough uniformity of job turnover statistics and readily explained by intuitive theoretical considerations. When viewed as a component of the mix of institutional differences in Europe and North America, European dismissal restrictions are essential to a proper interpretation of both similar patterns in job turnover and marked differences in unemployment flows.

### **Continuous Training in Germany**

**Jörn-Steffen Pischke**

NBER Working Paper No. 5829

November 1996

JEL Nos. J24, J31

Labor Studies

Using data from the German Socioeconomic Panel, I describe the incidence, attributes, and outcomes of continuous training received by workers in Germany between 1986 and 1989. Further training is primarily a white collar phenomenon and is

concentrated among the more highly educated, and in the service sector and in public administration. Much of this training seems to be general and provided to workers by their employers at no direct cost. On the other hand, the training does not seem to result in large short-run wage gains, especially for men. These results are somewhat at odds with the conventional models about the financing of human capital formation.

### **Conditioning Manager Alphas on Economic Information: Another Look at the Persistence of Performance**

**Jon A. Christopherson, Wayne E. Ferson, and Debra A. Glassman**

NBER Working Paper No. 5830

November 1996

JEL Nos. G1, G2

Asset Pricing

We evaluate persistence in the performance of institutional equity managers. Building on recent work on *conditional performance evaluation*, and using time-varying conditional expected returns and risk measures, we find that the investment performance of pension fund managers persists over time. A conditional approach is better able to detect this persistence and to predict the future performance of the funds than traditional methods are. The performance persistence is concentrated especially in the managers with negative prior-period conditional alphas.

### **Health Insurance for Poor Women and Children in the United States: Lessons from the Past Decade**

**Jonathan Gruber**

NBER Working Paper No. 5831

November 1996

JEL Nos. I18

Health Care, Labor Studies, Public Economics, Well-Being of Children

The Medicaid program, which provides health insurance coverage to low-income women and children, has expanded dramatically over the past decade. This expansion provides a "natural laboratory" for learning about the effect of eligibility for public health insurance on insurance coverage, health utilization, and health outcomes. This paper provides an overview of what has been learned about these questions from studying the expansions.

Medicaid eligibility rose steeply during 1984–92, but coverage rose much less sharply, because of limited takeup of benefits. This is due in part to the fact that many eligibles already had private insurance coverage; the evidence suggests that a large share of new Medicaid enrollees dropped their private coverage to join the program. Nevertheless, utilization of preventive care rose substantially as a result of the expansions, and there were significant improvements in health outcomes, specifically in infant and child mortality.

While these reductions in mortality came at a significant cost to the Medicaid program, the cost per life saved was low relative to alternative uses of government funds. These findings highlight both the potential benefits of public insurance policy and the importance of appropriately targeting scarce public health dollars.

## **Distributional Implications of Introducing a Broad-Based Consumption Tax**

**William M. Gentry and  
R. Glenn Hubbard**

NBER Working Paper No. 5832

November 1996

JEL No. H2

Public Economics

As a tax base, "consumption" sometimes is alleged to be less fair than "income," because the benefits of not taxing capital income accrue to high-income households. We argue that, despite the common perception that consumption taxation eliminates all taxes on capital income, consumption and income taxes actually treat much of what is commonly called capital income similarly. Indeed, relative to an income tax, a consumption tax exempts only the opportunity cost of capital. In contrast to a pure income tax, a consumption tax replaces capital depreciation with capital expensing. This change eliminates the tax on the opportunity cost of capital, but does not change — relative to the income tax — the tax treatment of capital income that arises from a risk premium, inframarginal profit, or luck. Because these components of capital income are skewed more heavily toward the top of the distribution of economic well-being, a consumption tax is more progressive than would be estimated under conventional distributional assumptions. We prepare distribution tables and demonstrate that this modification is quantitatively important.

## **Research Productivity in a System of Universities**

**James D. Adams and  
Zvi Griliches**

NBER Working Paper No. 5833

November 1996

JEL Nos. D2, L3, O3

Productivity

The focus of this paper is the research performance of a system of universities and sciences. Using data from the United States during the 1980s, we study the relationship between research output and R and D in eight different fields of science. We begin at the field level by examining the time-series behavior of outputs (measured by papers and citations) in relation to R and D. At this level we find approximate parity between growth rates of papers and citations and the rate of growth of R and D, with mathematics and agriculture, which diverge from parity in opposite directions, being exceptions. This suggests the predominance of a CRS production process for new scientific results.

We then conduct an analysis at the university and field level. For this purpose we use small samples of leading U.S. research universities. We then find that returns to R and D are diminishing in nearly every case. Two explanations are offered for the divergence in results. The first points to the importance of research spillovers between universities and fields, which are excluded at the university level but not at the system level. The second explanation is that errors in R and D are more important at the university level. The errors arise mostly from misclassification of R and D by university and field. Together these explanations emphasize the relevance of research spillovers and of the system-wide aspects of university research. They also pinpoint the sources of the many failings of contemporary data on science resources, and stress the value

of better accounting for university R and D, resources, and outputs.

In addition we explore some efficiency aspects of the university system. Our findings suggest that leading schools have lower average and marginal costs of performing research than lesser institutions, and that leading institutions have a comparative advantage at generating higher quality, more highly cited research. In our comparisons of private and public institutions the results are not as one-sided, yet they suggest once again that private schools have a comparative advantage at generating more highly cited research.

## **Medicaid and Service Use among Homeless Adults**

**Sherry A. Glied, Christina Hoven,  
Robert Moore, and  
A. Bowen Garrett**

NBER Working Paper No. 5834

November 1996

JEL Nos. I11

Health Care

Expansions of Medicaid eligibility are intended to improve access to care, and to shift care from emergency rooms and inpatient hospitalization to more appropriate sites. We examine the effect of receiving Medicaid on the level and site of medical service utilization using data from 1985 and 1987 surveys of New York City homeless single men and women.

Simple regressions of Medicaid on the use of health services among homeless adults indicate that Medicaid significantly increases the likelihood that these individuals receive services, especially emergency and inpatient hospital services. We test this result in further analyses that control for health status, use instrumental variables procedures, and examine differences between a similar population in 1985 and 1987. These analyses suggest that Medicaid neither increases nor diminishes

access to emergency rooms. We find some evidence that suggests that Medicaid does improve access to nonhospital medical care.

**On the Validity of Season of Birth as an Instrument in Wage Equations: A Comment on Angrist and Krueger's "Does Compulsory School Attendance Affect Schooling and Earnings?"**

**John Bound and David A. Jaeger**

NBER Working Paper No. 5835

November 1996

JEL Nos. J24

Labor Studies

In an important and provocative paper, "Does Compulsory School Attendance Affect Schooling and Earnings?", Angrist and Krueger use quarter of birth as an instrument for educational attainment in wage equations. To support a causal interpretation of their estimates, they argue that compulsory school attendance laws *alone* account for the association between quarter of birth and earnings. In this note we present evidence that the association between quarter of birth and earnings is too strong to be explained fully by compulsory school attendance laws in the samples studied by Angrist and Krueger. Moreover, while the association between quarter of birth and educational attainment was weaker for more recent cohorts, we found no evidence that the strength of the relationship between quarter of birth and earnings also was weaker in those cohorts. In addition, we present evidence that suggests the association between quarter of birth and earnings or other labor market outcomes existed for cohorts that were not bound by compulsory school attendance laws. Our results call into question the validity of any causal inferences based on Angrist and Krueger's estimates regarding the effect of education on earnings.

**Computers and Productivity in France: Some Evidence**

**Nathalie Greenan and Jacques Mairesse**

NBER Working Paper No. 5836

November 1996

JEL Nos. C20, C81, D24, L63, O33

Productivity

In this paper, we make a first attempt at exploring the relationship between computer use and productivity in French manufacturing and services industries. We match information on computer utilization in the workplace collected at the employee level in 1987, 1991, and 1993 with firm-level information on productivity, capital intensity, and average wage. Based on the responses of very few interviewed employees (only one for 75 percent of the firms in our sample), our measure of firm computer use is subject to important sampling errors; hence our estimates of computer impacts are affected strongly by the downward biases of random errors in variables. Nonetheless, we find coherent and persuasive evidence that the computer impacts on productivity are indeed positive, and that the returns to the firm should be at least in the same range as the returns to the other types of capital. We also show that the sampling errors in measurement biases can be assessed. We make the general point that econometric studies of the firm can be enriched effectively and substantially by using information collected from workers, even if very few of them are surveyed per firm.

**You Can't Take It with You? Immigrant Assimilation and the Portability of Human Capital**

**Rachel M. Friedberg**

NBER Working Paper No. 5837

November 1996

JEL Nos. J61, J24

Labor Studies

The national origin of an individual's human capital is a crucial determinant of its value. Education acquired abroad is valued significantly less than education obtained domestically. This difference can explain fully the earnings disadvantage of immigrants relative to comparable natives in Israel. Variation in the return to foreign schooling across origin countries may reflect differences in its quality and in compatibility with the host labor market. Three factors — language proficiency, domestic labor market experience, and further education following immigration — appear to raise the return to education acquired abroad, suggesting a compound benefit of policies encouraging immigrants to obtain language and other training.

**Do Balanced Budget Rules Work? U.S. Experience and Possible Lessons for the EMU**

**Robert P. Inman**

NBER Working Paper No. 5838

November 1996

JEL Nos. D78, H61, H62, K23

Public Economics

The "Excessive Deficit Procedure" of the Maastricht Treaty on Economic and Monetary Union (EMU) proposes two fiscal convergence conditions for entry and continued membership: 1) a country's overall budget deficit for each fiscal year must be equal to or below 3 percent of GDP, and 2) a country's stock of gross public debt must be equal to or less than 60 percent of GDP. Will the current EMU Excessive Deficit Procedure work as an effective constraint on countries' deficit behaviors? When understood within the context of a political economy model of deficit behavior, recent U.S. evidence on balanced budget rules strongly suggests that effective deficit constraints: must use *ex post* deficit accounting; must be constitutionally grounded; must be enforced by an open and politically indepen-

dent review panel or court, with significant sanctions for violations; and must be costly to amend. While ex post, constitutionally grounded, and difficult to amend, current EMU rules are not presently enforced by an open and politically independent review panel using significant penalties. The ability of the EMU's deficit procedure to constrain "excessive" country borrowing is therefore in doubt. I discuss institutional reforms that will strengthen the EMU's balanced budget procedures.

## **International Implications of German Unification**

**Hans-Werner Sinn**

NBER Working Paper No. 5839

November 1996

JEL Nos. F01

International Finance and  
Macroeconomics

This paper advances the hypothesis that the EUS crisis was caused by German unification. The unification implied a massive demand for resources which parallels the U.S. resource demand following Reagan's tax reforms in the 1980s. The resource demand revised German interest rates relative to the rest of the world, bringing about devaluations of other European currencies. This paper identifies those European currencies which currently are undervalued.

## **The Adoption of Workers' Compensation in the United States, 1900–1930**

**Price V. Fishback and  
Shawn E. Kantor**

NBER Working Paper No. 5840

November 1996

JEL Nos. J38, K31, N41, N42

Development of the American Economy

The adoption of workers' compensation in the 1910s was, from a variety of perspectives, a significant

event in the economic, legal, and political history of the United States. The legislation represented the first instance of a widespread social insurance program in the United States, setting the stage for the later adoption of federal government programs for unemployment insurance, old-age pensions, and health insurance. In this paper, we show that the adoption of workers' compensation was not the result of employers' or workers' "capturing" the legislation to secure benefits at the expense of the other group. Nor was the success of compensation legislation simply the outcome of Progressive Era social reformers' demands for protective legislation. Workers' compensation was enacted rapidly across the United States in the 1910s because the key economic interest groups with a stake in the legislation — employers, workers, and insurance companies — anticipated benefits from resolving an apparent "crisis" in the negligence liability system. During the first decade of the twentieth century, workplace accident risk rose, state legislatures adopted a series of employers' liability laws, and court decisions limited employers' defenses in liability suits, all of which combined to substantially increase the uncertainty of the negligence liability system.

## **Volatility and the Investment Response**

**Joshua Aizenman and  
Nancy P. Marion**

NBER Working Paper No. 5841

November 1996

JEL Nos. F21, E2, O1

International Trade and Investment

We use the World Bank decomposition of aggregate investment shares into their private and public components to test for the correlation between volatility and investment in a set of developing countries. We

uncover a statistically significant negative correlation between various volatility measures and private investment, even after adding the standard control variables. No such correlation is uncovered when the investment measure is the sum of private and public investment spending. Indeed, public investment spending is correlated positively with some measures of volatility.

We also use the new World Bank data to redo the Ramey and Ramey (1995) test for a correlation between investment and the standard deviation of innovations to a forecasting equation for growth. While Ramey and Ramey found no significant correlation using aggregate investment data, we find a negative and highly significant relationship between innovation volatility and private investment in developing countries. These findings suggest that the detrimental impact of volatility on investment may be difficult to detect using aggregate data.

## **When Are Fixed Exchange Rates Really Fixed?**

**Andrés Velasco**

NBER Working Paper No. 5842

November 1996

JEL Nos. E52, F31, O23

International Finance and  
Macroeconomics

This paper analyzes the sustainability of fixed exchange rates by extending the Barro-Gordon framework to a fully dynamic context in which the level of a state variable (in this case, debt) determines the payoffs available to the government at each point in time. The model yields the following results: If debt is sufficiently low, there is an equilibrium in which the government does not devalue. For an intermediate range of debt levels, the government devalues in response to an attack but not otherwise, so self-fulfilling attacks can

occur. Finally, for yet another debt range, there can be sunspot equilibriums in which an attack (and the corresponding devaluation) is likely to occur.

### **The Effects of Short-Term Variation in Abortion Funding on Pregnancy Outcomes**

**Philip J. Cook, Allan M. Parnell, Michael J. Moore, and Deanna Pagnini**

NBER Working Paper No. 5843

November 1996

JEL Nos. I18

Economics of Health Care

In 1978 North Carolina created a special fund to pay for abortions for indigent women. The appropriations for that fund have proven inadequate during five of the years in which it has been in operation, with the result in each case being that no state funding was available for several months. This on-again, off-again funding pattern provides a natural experiment for estimating the short-run effect of changes in the cost of abortions on the number of abortions (and births) to indigent women. We use a unique dataset obtained from the state which includes individual records for all pregnancies terminated since 1978. For various demographic groups, we estimate the effects of the termination of funding on the abortion rate per month, the birth rate per month (adjusted to take account of variations in gestation periods), and the probability that a pregnancy will end in abortion. The results suggest that the decisions of poor black women aged 18–29 are particularly sensitive to the availability of abortion funding. Overall, approximately three in every ten pregnancies that would have resulted in an abortion if state funds had been available instead are carried to term.

### **Neoclassical Versus Endogenous Growth Analysis: An Overview**

**Bennett T. McCallum**

NBER Working Paper No. 5844

November 1996

JEL Nos. O40, O30

Economic Fluctuations and Growth

This paper begins with an exposition of neoclassical growth theory, including several analytical results, such as the distinction between golden-rule and optimal steady states. Next it emphasizes that the neoclassical approach fails to provide any explanation of steady-state growth in per-capita values of output and consumption, and cannot plausibly explain actual growth differences by reference to transitional episodes. I present and discuss three types of endogenous growth models, all of which attempt to provide explanations of ongoing per-capita growth. The likelihood of strictly justifying steady-state growth with these models is very small, since it would require highly special parameter values, but the models' predictions may be reasonably accurate nevertheless.

### **Is There a Role for Monetary Aggregates in the Conduct of Monetary Policy?**

**Arturo Estrella and Frederic S. Mishkin**

NBER Working Paper No. 5845

November 1996

JEL Nos. E52

Economic Fluctuations and Growth and Monetary Economics

We examine the potential policy role of monetary aggregates by attempting to use them as effectively as possible in the analysis of empirical relationships. We consider three possible roles: information variables; indicators of policy actions; and instruments in a policy rule. These require successively stronger and

more stable relationships between the aggregates and the final policy targets. Our results show that in the United States since 1979, the monetary aggregates fall considerably short of those requirements; results with German M3 are hardly more favorable. We also investigate whether empirical relationships reflect causal relationships because of the use of these monetary aggregates in countercyclical policy. The results are reasonably consistent with that notion in the case of interest rates, but not in the case of the aggregates.

### **Manufactured Inequality**

**Sherwin Rosen**

NBER Working Paper No. 5846

December 1996

Labor Studies

Many discrete life choices — including where to live, what kind of job to hold, and consumption lifestyle — are stratified by income. Stratification and sorting often manifest state-dependent preferences in which the marginal utility of income (or consumption) depends on the outcome of earlier choices. For example, one can choose to live a quiet life in the country, where money buys few things, or can choose a more active and exciting lifestyle in a large city, where money has greater value because of all the goods that are available. The natural market equilibrium stratification is for rich people to live in the city, where their money has more value, and for poor people to live in the country, where money is less productive. But before location is chosen, the a priori von Neuman-Morgenstern utility function over both choices can take the Friedman-Savage form, providing pareto efficient social demands for *inequality*. If there is not enough initial inequality to produce the socially optimal stratification, then inequality is manufactured socially. People voluntarily participate in gambles and

lotteries in which the winners are rich and live in exciting places and the losers are poor and choose the quiet life. There is a "natural rate of inequality."

### **Infrastructure Capital and Economic Growth: How Well You Use It May Be More Important Than How Much You Have**

**Charles R. Hulten**

NBER Working Paper No. 5847

December 1996

Productivity

This paper shows that low and middle income countries that use infrastructure inefficiently pay a growth penalty in the form of a much smaller benefit from their investments in infrastructure. The magnitude of this penalty is apparent when the growth experience of Africa is compared to that of East Asia: over one quarter of the differential growth rate between these two regions can be attributed to the difference in their use of infrastructure resources. At the same time, the difference attributable to new public capital formation is negligible. Comparing high and low growth rate economies conveys an even stronger impression: more than 40 percent of the growth differential is attributable to the efficiency effect, making it the single most important explanation of differential growth performance.

### **The Demise of Double Liability as an Optimal Contract for Large-Bank Stockholders**

**Berry K. Wilson and Edward J. Kane**

NBER Working Paper No. 5848

December 1996

JEL Nos. G2, N2

Corporate Finance

This paper tests the optimal-contracting hypothesis, drawing upon

data from a natural experiment that ended during the Great Depression. The subjects of our experiment are bank stockholders. The experimental manipulation concerns the imposition of state or federal restrictions on the contracts they write with bank creditors. We contrast stockholders that were subject to the now-conventional privilege of limited liability with stockholders that faced an additional liability in liquidation tied to the par value of the bank's capital. Our tests show that optimal contracting theory can explain both the long survival of extended-liability rules in banking and why they were abandoned in the 1930s.

### **Bank Consolidation: A Central Banker's Perspective**

**Frederic S. Mishkin**

NBER Working Paper No. 5849

December 1996

JEL No. G21

Economic Fluctuations and Growth and Monetary Economics

This paper looks at why bank consolidation has been taking place in the United States and what the structure of the banking industry might look like in the future. It then discusses the implications for the economy of bank consolidation and the challenge it poses for central bankers.

### **Tax Burden and Migration: A Political Economy Perspective**

**Assaf Razin and Efraim Sadka**

NBER Working Paper No. 5850

December 1996

JEL Nos. F22, H2, J1

International Finance and

Macroeconomics and Public Economics

The extent of taxation and redistribution policy is determined generally at a political-economy equilibrium by a balance between those who gain

and those who lose from a more extensive tax-transfer policy. In a stylized model of migration and human capital formation, we find — somewhat against conventional wisdom — that low-skill migration may lead to a lower tax burden and less redistribution than no migration, even though the migrants (naturally) join the pro-tax cum-transfer coalition.

### **Optimal Government Spending and Taxation in Endogenous Growth Models**

**Giancarlo Corsetti and Nouriel Roubini**

NBER Working Paper No. 5851

December 1996

JEL Nos. E62, O41

Public Economics

This paper analyzes optimal spending, tax, and financial policies using models of endogenous growth in which public spending is productive. We extend previous work in four directions: First, we analyze optimal policies when the government is allowed to borrow and lend, rather than being restricted to running a balanced budget in every period. Second, we develop a model with a separate sector for human capital accumulation. Therefore, the properties of optimal policies depend on whether government spending affects the productivity of the final goods sector or of the human capital accumulation sector. Third, we consider the policy implications of alternative assumptions about which factor of production benefits from the external effects of productive public goods. Fourth, we study the implications of restrictions on the menu of tax instruments available to the policy-maker. We contrast optimal tax rates on human and physical capital under different assumptions about technology and distribution. We analyze the welfare properties of public debt and assets.



## **Are Some Mutual Fund Managers Better Than Others? Cross-Sectional Patterns in Behavior and Performance**

**Judith Chevalier and Glenn Ellison**

NBER Working Paper No. 5852

December 1996

JEL Nos. G23, G14, J41

Asset Pricing, Corporate Finance and Industrial Organization

In this paper we explore cross-sectional differences in the behavior and performance of mutual fund managers. In our simplest regression of a fund's excess market return on characteristics of its manager, we find that younger managers earn much higher returns than older managers, and that managers who attended colleges with higher average SAT scores earn much higher returns than managers from less selective institutions do. These differences appear to derive both from systematic differences in expense ratios and risk-taking behavior, and from additional systematic differences in performance: managers from higher-SAT schools have higher risk-adjusted excess returns. Managers with the "best" characteristics may beat the market on average. We also present a preliminary look at the labor market for mutual fund managers. Our data suggest that managerial turnover is more sensitive to performance for younger managers.

## **Product Standards Coalitions in a Market Without Borders**

**Alessandra Casella**

NBER Working Paper No. 5853

December 1996

JEL Nos. F15, L16, R59

International Finance and Macroeconomics and International Trade and Investment

Traditional analyses in international trade identify standards as government regulations and investigate their potential for distortion of trade flows. In reality, however, private industry groups exercise critical influence on the determination of technical standards. The composition of these groups is affected by technology and market conditions, and in an integrated market the alliances of private firms are likely to cross national boundaries, generating harmonization "from the bottom." If standards are public goods whose ideal value differs across economic activities and countries, then economic integration should bring increased harmonization across countries and finer differentiation across products. Empirical evidence from the United States and the European Union, although mostly anecdotal, supports this prediction.

## **Effective Protection Redux**

**James E. Anderson**

NBER Working Paper No. 5854

December 1996

JEL Nos. F13, D72

International Trade and Investment

This paper rehabilitates the concept of "effective rate of protection" (ERP) for use in political economy. I redefine the ERP for a sector here as the uniform tariff that is equivalent to the actual differentiated tariff structure in its effect on rents to residual claimants in the sector. The new ERP permits a political economic ranking of "how much protection is given" across sectors, since higher uniform tariff equivalents imply higher losses of welfare sacrificed to interest groups. The new ERP converges to the old ERP under a very special set of assumptions, and elsewhere generalizes the ERP concept to any economic structure in which residual claims are defined. I present numerical results for the new ERP for the U.S. economy in 1982, using the USDA/ERS computable general equi-

librium model. The calculated old and new ERPs are not correlated significantly.

## **The Timing of Work Time Over Time**

**Daniel S. Hamermesh**

NBER Working Paper No. 5855

December 1996

JEL No. J20

Labor Studies

The incidence of evening and night work declined sharply in the United States between the early 1970s and the early 1990s, while the fraction of work performed at the fringes of the traditional regular working day grew. The secular decline in evening and night work did not result from industrial shifts or demographic changes. It was greatest at the upper end of the wage distribution, slowest among workers in the lowest quartile of wages. The observed changes in timing are consistent with and magnify the increase in wage inequality in the United States that occurred during this period. They are explained easily by a model that views evening/night work as a disamenity, with rising real incomes causing workers to shift away from such work in the presence of only neutral technical change in the profitability of work at different times of day.

## **The Invisible Hand and the Grabbing Hand**

**Timothy Frye and**

**Andrei Shleifer**

NBER Working Paper No. 5856

December 1996

JEL No. 123

Economic Fluctuations and Growth and Public Economics

Evidence from a survey of 105 shopowners in Moscow and Warsaw shows that the reliance on private protection, as well as the burden of regulation and corruption, are much

greater in Moscow. The evidence suggests that the "invisible hand" model of government better fits the Warsaw local government, and the "grabbing hand" model is more appropriate for Moscow. The evidence implies that the singular focus on the speed of economic reforms in attempting to understand the success of transition is misplaced, and that the quality of government may be as essential.

### **Consumption and Portfolio Decisions When Expected Returns are Time Varying**

**John Y. Campbell and Luis M. Viceira**

NBER Working Paper No. 5857

December 1996

JEL No. G12

Asset Pricing, Economic Fluctuations and Growth, and Monetary Economics

This paper proposes and implements a new approach to a classic unsolved problem in financial economics: the optimal choice of consumption and portfolio on the part of a long-lived investor facing time-varying investment opportunities. We approximate the choice problem by log-linearizing the budget constraint and Euler equations, and then derive an analytical solution to the approximate problem. When our model is calibrated to U.S. stock market data, it implies that intertemporal hedging motives greatly increase, and may even double, the average demand for stocks by investors whose risk-aversion coefficients exceed one.

### **Accounting for Outward Direct Investment from Hong Kong and Singapore: Who Controls What?**

**Linda Low, Eric D. Ramstetter, and Henry Wai-Chung Yeung**

NBER Working Paper No. 5858

December 1996

After briefly introducing and examining the economic rationale for accounting for foreign direct investment (FDI), we survey information about outward investors from Hong Kong and Singapore. We aim to illuminate the implications of accounting for such FDI by geographical source or by country of ultimate beneficial owner. By any measure, it is clear that a very large portion of the FDI from these economies comes from foreign-controlled firms; hence ownership-based estimates of FDI from these two economies would be much smaller than the standard, geography-based estimates. However, because outward investment by foreign firms in Hong Kong and Singapore often involves substantial contributions from local staff and partners, we attempt to examine the extent of control over investment decisions exercised by these local staff and partners. Case studies from Hong Kong indicate a tendency for local control over investment decisions to be relatively strong in four types of foreign-controlled Hong Kong firms: recently acquired firms; firms with strong local entrepreneurial involvement; customer-oriented firms; and relocated holding companies. On the other hand, evidence from a sample of Thai affiliates of foreign-controlled Hong Kong or Singapore investors suggests that many of the investors were acting as part of an integrated network of foreign investors. Thus, although it is clear that local staff and partners have a large influence over the investment decisions of foreign-controlled outward investors in Hong Kong and Singapore, it does not appear that such firms are a majority among foreign-controlled investors in these economies.

### **The Characteristics of Multi-Unit Ownership in Franchising: Evidence from Fast-Food Restaurants in Texas**

**Arturs Kalnins and Francine Lafontaine**

NBER Working Paper No. 5859

December 1996

JEL Nos. L2, L8, D4, D8

Industrial Organization

One empirical phenomenon that has received little attention in the franchising literature is the tendency for individual franchisees to own several units of a given franchised chain. Most current theories of franchising — based on incentives, information asymmetries, and strategic arguments — have little capacity to explain this phenomenon. In fact, several of them imply that all units should be independently-owned and operated. However, given the existence of multi-unit owners, most of the theories have implications for the extent to which units owned by a single owner should be: 1) geographically near each other; 2) located in areas where populations display similar demographic characteristics; and 3) contiguous to each other, that is, should share a market boundary.

We provide empirical evidence that restaurants of individual owners in the six largest fast-food chains in Texas are geographically close to each other, that they are located in areas with similar demographic characteristics, and that they are contiguous. This suggests, among other things, that franchising is not a strategic delegation device, and that the location of units is not determined by the franchisee's desire to diversify away risk. Instead, the minimization of monitoring or free-riding costs, and the franchisor's reliance on the franchisee's local market expertise, appear to be central concerns in the allocation of units across franchisees.

## **Fundamental Determinants of National Equity Market Returns: A Perspective on Conditional Asset Pricing**

**Wayne E. Ferson and Campbell R. Harvey**

NBER Working Paper No. 5860

December 1996

JEL Nos. F3, G0, G1

Asset Pricing

This paper provides a global-asset-pricing perspective on the debate over the relationship of predetermined attributes of common stocks — such as ratios of price-to-book-value, cash-flow, earnings, and other variables — to the future returns. Some argue that such variables may be used to find securities that are undervalued systematically by the market, while others argue that the measures are proxies for exposure to underlying economic risk factors. It is not possible to distinguish between these views without explicitly modeling the relationship between such attributes and risk factors. We present an empirical framework for attacking the problem at a global level, assuming integrated markets. Our perspective pulls together the traditional academic and practitioner viewpoints on lagged attributes. We present new evidence on the relative importance of risk and mispricing effects, using monthly data for 21 national equity markets. We find that the cross-sectional explanatory power of the lagged attributes is related to both risk and mispricing in the two-factor model, but that the risk effects explain more of the variance than mispricing.

## **An International Comparison of Employment Adjustment to Exchange Rate Fluctuations**

**Simon Burgess and Michael M. Knetter**

NBER Working Paper No. 5861

December 1996

JEL Nos. E24, F14, J21

International Finance and Macroeconomics and International Trade and Investment

This paper evaluates the response of employment to exchange rate shocks at the industry level for the G-7 countries. Using a simple empirical framework that places little *a priori* structure on the pattern of response to shocks, we find that the data are consistent with the view that employment in European industries, at least in France and Germany, is much less influenced by exchange rate shocks and much slower to adjust to long-run steady states. The United States, Japan, Canada, the United Kingdom, and Italy all appear to adjust more quickly. German and Japanese employment are quite insensitive to exchange rate fluctuations; this is consistent with previous research on output and markup responses to exchange rates.

## **Goods Prices and Exchange Rates: What Have We Learned?**

**Pinelopi K. Goldberg and Michael M. Knetter**

NBER Working Paper No. 5862

December 1996

JEL Nos. F1, F3, L1

International Finance and Macroeconomics and International Trade and Investment

Import prices typically change by a smaller proportion than the exchange rate between the exporting and importing country. Recent research indicates that common-

currency relative prices for similar goods exported to different markets are highly correlated with exchange rates between those markets. This evidence suggests that incomplete pass-through is a consequence of third-degree price discrimination. While distance matters for market segmentation, borders have independent effects. The source of the border effect has not been identified clearly. Furthermore, there is little evidence yet suggesting that substantial market power is implied by the observed price discrimination.

## **Do Borders Matter for Social Capital? Economic Growth and Civic Culture in U.S. States and Canadian Provinces**

**John F. Helliwell**

NBER Working Paper No. 5863

December 1996

JEL Nos. F15, O15, P52

This paper first assesses differences among regional and ethnic groups in social trust and memberships, both in Canada and the United States. The ethnic categories that people choose to describe themselves are as important as regional differences, but much less important than education, in explaining differences in trust. Respondents who qualify their nationality by any of seven adjectives (black, white, Hispanic, and Asian in the United States; French, English, and Ethnic in Canada), a feature more prevalent in the United States than in Canada, have lower levels of trust than those who consider themselves Canadians or Americans either first or only.

The dispersion of incomes across states or provinces has been dropping in both countries, but faster in Canada than in the United States. The 1980s increase in regional income disparity in the United States has no parallel in Canada. In neither country

is there evidence that per capita economic growth is faster in regions marked by high levels of trust. However, U.S. migrants tend to move to states with higher perceived levels of trust, thus contributing to higher total growth in those states. The economic responsiveness of migration appears to be even stronger in Canada than in the United States, despite the much more extensive systems of fiscal equalization and social safety nets in Canada.

### **Trust in Large Organizations**

**Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny**

NBER Working Paper No. 5864

December 1996

JEL No. I23

Corporate Finance

Several authors suggest that trust is an important determinant of cooperation among strangers in a society, and therefore of the performance of social institutions. We argue that trust should be particularly important for the performance of large organizations. In a cross-section of countries, evidence on government performance, participation in civic and professional societies, importance of large firms, and the performance of social institutions supports this hypothesis more generally. Moreover, trust is lower in countries with dominant hierarchical religions, which may have deterred "horizontal networks of cooperation" among people. In sum, theories of trust hold up remarkably well on a cross-section of countries.

### **Appropriate Technology and Growth**

**Susanto Basu and David N. Weil**

NBER Working Paper No. 5865

December 1996

JEL Nos. O30, O40

Economic Fluctuations and Growth

We present a model of growth and technology transfer based on the idea that technologies are specific to particular combinations of inputs. We argue that this model is more realistic than the usual specification, in which an improvement in any technique for producing a given good improves all other techniques for producing that good. Our model implies that technology improvements will diffuse only slowly, even if there are no barriers to the flow of knowledge and no adoption costs. On the other hand, although our basic production technology is of the "Ak" variety, technology diffusion implies that countries with identical policies and different initial incomes eventually do converge to the same level of per-capita income. We argue that a model with appropriate technology and technology diffusion is more appealing, and has more realistic predictions for long-run convergence and growth, than either the standard neoclassical model or simple endogenous-growth models.

### **Disability Insurance Benefits and Labor Supply**

**Jonathan Gruber**

NBER Working Paper No. 5866

December 1996

JEL No. J26

Health Care, Labor Studies, and Public Economics

Disability Insurance (DI) is a public program that provides income support to persons unable to continue work because of disability. The difficulty of defining disability, however, has raised the possibility that this program may subsidize the early retirement of workers who are not truly disabled. A critical input for assessing the optimal size of the DI program therefore is the elasticity of labor force participation with respect to the generosity of benefits. Unfortunately, this parameter has been difficult to estimate in the context of the

U.S. DI program, since all workers face an identical benefits schedule. I surmount this problem by studying the experience of Canada, which operates two distinct DI programs, for Quebec and the rest of Canada. The latter program raised its benefits by 36 percent in January 1987, while benefits were constant in Quebec, providing exogenous variation in the generosity of benefits across similar workers. I study this increase in relative benefits using both simple "difference-in-difference" estimators and more parameterized estimators that exploit the differential impact of this policy change across workers. I find that there was a sizeable labor supply response to the policy change; my central estimates imply an elasticity of labor force non-participation with respect to DI benefits of 0.25 to 0.32. Despite this large labor supply response, simulations suggest that there were welfare gains from this policy change under plausible assumptions about preference parameters.

### **Racism, Xenophobia or Markets? The Political Economy of Immigration Policy Prior to the Thirties**

**Ashley S. Timmer and Jeffrey G. Williamson**

NBER Working Paper No. 5867

December 1996

JEL Nos. F22, F13, N3, P16

Labor Studies and Development of the American Economy

Contrary to conventional wisdom, the doors did not suddenly slam shut on American immigrants when Congress passed the Emergency Quota Act of May 1921. Rather, the United States had started imposing restrictions a half century earlier. Argentina, Australia, Brazil, and Canada enacted similar measures, although the anti-immigration policy drift often took the form of an enormous drop in (or even the disappearance of) large immigrant subsidies.

Also contrary to conventional wisdom, there wasn't simply one big regime switch around World War I. What then explains immigration policy between 1860 and 1930? We identify the fundamentals that underlay the formation of immigration policy, distinguishing between the impact of these long-run fundamentals and short-run timing, and clarifying the difference between market and non-market forces. The key bottom line is this: over the long haul, immigrant countries tried to maintain the *relative* economic position of unskilled labor, compared with skilled labor, landowners, and industrialists.

### **How Big Should Government Be?**

**Martin Feldstein**

NBER Working Paper No. 5868

December 1996

JEL No. H2

Public Economics

The appropriate size and role of government depends on the deadweight burden caused by incremental transfers of funds from the private sector. The magnitude of that burden depends on the increases in tax rates required to raise incremental revenue and on the deadweight loss that results from higher tax rates. Both components depend on the full range of behavioral responses of taxpayers to increases in tax rates. The first part of this paper explains why the official method of revenue estimation used by the Treasury and the Congress underestimates the tax rate increases required to raise additional revenue. This is closely related to the on-going debate about the use of "dynamic" revenue estimation. The second part of the paper emphasizes that the deadweight burden caused by a tax rate increase depends not just on the response of labor force participation and average working

hours but also on other dimensions of labor supply, on the forms in which compensation is paid, on the individuals' spending on tax favored (deductible or excludable) forms of consumption, and on the intertemporal allocation of consumption. Recent econometric work implies that the deadweight burden caused by incremental taxation (the marginal excess burden) may exceed one dollar per dollar of revenue raised, making the cost of incremental government spending more than two dollars for each dollar of government spending.

### **Does Regulation Improve Outputs and Increase Prices?: The Case of Dentistry**

**Morris M. Kleiner and Robert T. Kudrle**

NBER Working Paper No. 5869

January 1997

JEL No. J51

Labor Studies

We examine the role of occupational licensing policies and practices in improving the services provided to consumers. We also consider the effect of restrictive regulations on the prices of certain services. The theory suggests that more restrictive licensing may raise prices, but also that it may raise demand by reducing uncertainty about the quality of the services. This paper uses unique data on the dental health of incoming Air Force personnel to empirically analyze the effects of variations in licensing stringency among the states. We find that tougher licensing does not lead to improved outputs (in this case, dental health), but does raise prices. Our results cast doubt on the main public interest argument in favor of the more strenuous licensing practices that exist in the more restrictive states.

### **Learning, Complementarities, and Asynchronous Use of Technology**

**Boyan Jovanovic and Dmitriy Stolyarov**

NBER Working Paper No. 5870

January 1997

JEL No. L23

Productivity

This paper deals with processes that require several complementary inputs, all of which may be subject to improvements in quality. If, after a quality upgrade, one of these inputs requires a period of learning before it can be used effectively, then in general it will pay to purchase the inputs at different dates: that is, the purchases will be asynchronous. That is because it is wasteful to tie up funds in the other inputs which will be underutilized until the learning is completed.

We show that technology has been used asynchronously in the automobile and television broadcasting industries, in the supply of electricity, and in railways. We argue that our model helps to explain this evidence.

### **Solow vs. Solow: Machine Prices and Development**

**Boyan Jovanovic and Rafael Rob**

NBER Working Paper No. 5871

January 1997

JEL No. O31

Productivity

Machines are more expensive in poor countries; this relationship is pronounced. It is hard for a 1956 Solow-type of model to explain the relationship between machine prices and GDP, given that in most countries investment in equipment is less than 10 percent of GDP. A stronger relationship emerges in a 1959 Solow-type of vintage model, in which technology is embodied in machines.

## **The Generalized War of Attrition**

**Jeremy Bulow and Paul Klemperer**

NBER Working Paper No. 5872

January 1997

JEL Nos. D43, D44, L13, O30

Public Economics

We generalize the "War of Attrition model" to allow for  $(N + K)$  firms competing for  $N$  prizes. There are two particularly interesting special cases. First, if firms continue to pay their full costs after dropping out (as in a standard-setting context), each firm's exit time is independent of both  $K$  and the actions of other players. Second, in the limiting case in which firms pay no costs after dropping out (as in a natural-oligopoly problem), the field is reduced immediately to  $(N + 1)$  firms. Furthermore, there is perfect sorting, so it is always the  $(K - 1)$  lowest-value players who drop out in "zero time," even though each player's value is private information to the player. We apply our model to politics, explaining the length of time that it takes to collect a winning coalition to pass a bill.

## **Auction Theory: A Summary with Applications to Treasury Markets**

**Sanjiv Ranjan Das and Rangarajan K. Sundaram**

NBER Working Paper No. 5873

January 1997

JEL Nos. C72, G14

Asset Pricing

This review paper describes basic auction concepts and provides a summary of the theory in this area, particularly as it relates to Treasury auctions.

## **Does the Nominal Exchange Rate Regime Matter?**

**Atish R. Ghosh, Anne-Marie Gulde, Jonathan D. Ostry, and Holger C. Wolf**

NBER Working Paper No. 5874

January 1997

JEL Nos. F33, F41, F43

International Finance and Macroeconomics

The relevance of the exchange rate regime for macroeconomic performance remains a key question in international macroeconomics. We use a comprehensive dataset covering nine types of regime for 140 countries over 30 years to study the link between the regime, inflation, and growth. Two stylized facts emerge: First, inflation is both lower and more stable under pegged regimes, reflecting slower growth in the money supply and faster growth in money demand. Second, real volatility is higher under pegged regimes. In contrast, growth varies only slightly across regimes, although investment is somewhat higher and trade growth somewhat lower under pegged regimes. Thus pegged regimes are characterized by lower inflation but more pronounced output volatility.

## **An Optimizing IS-LM Specification for Monetary Policy and Business Cycle Analysis**

**Bennett T. McCallum and Edward Nelson**

NBER Working Paper No. 5875

January 1997

JEL Nos. E10, E30, E40

Economic Fluctuations and Growth and Monetary Economics

This paper asks whether IS-LM type relationships can be used for the aggregate demand portion of a dynamic optimizing general equilibrium model intended for analyzing

issues of monetary policy and cyclical fluctuations. We conclude that only one change — the addition of a term regarding expected future income — is needed to make the IS function match a fully optimizing model; no changes are needed for the LM function. This single modification imparts a dynamic, forward-looking aspect to saving behavior and leads to a model of aggregate demand that is both tractable and usable with a wide variety of specifications for aggregate supply.

## **Monetary Shocks and Real Exchange Rates in Sticky Price Models of International Business Cycles**

**V. V. Chari, Patrick J. Kehoe, and Ellen R. McGrattan**

NBER Working Paper No. 5876

January 1997

JEL Nos. F41, F31, F32

Economic Fluctuations and Growth and International Finance and Macroeconomics

The data show large and persistent deviations of real exchange rates from purchasing power parity. Recent work has shown that these movements are driven to a large extent by deviations from the law of one price for traded goods. In the data, real and nominal exchange rates are about six times as volatile as relative price levels; both are highly persistent, with serial correlations of 0.85 and 0.83, respectively. This paper develops a sticky price model with price discriminating monopolists, which produces deviations from the law of one price for traded goods. Our benchmark model, which has prices set for one quarter at a time and a unit consumption elasticity of money demand, does not come close to reproducing these observations. A model which has producers setting prices for six quarters at a time and a consumption elasticity of money

demand of 0.27 does much better. In it, real and nominal exchange rates are about three times as volatile as relative price levels. Exchange rates are persistent, with serial correlations of 0.65 and 0.66, respectively.

### **New Techniques to Extract Market Expectations from Financial Instruments**

**Paul Söderlind and Lars E. O. Svensson**

NBER Working Paper No. 5877

January 1997

JEL Nos. E43, E52, G13

Asset Pricing and International Finance and Macroeconomics

This paper is a selective survey of new or recent methods for extracting information about market expectations from asset prices for the purposes of monetary policy. Traditionally, interest rates and forward exchange rates have been used to extract expected means of future interest rates, exchange rates, and inflation. More recently, these methods have been refined to rely on implied forward interest rates, so as to extract expected future time-paths. Very recently, methods have been designed to extract not only the means but also the entire (risk neutral) probability distribution from a set of option prices.

### **The Segmentation of International Markets: Evidence from *The Economist***

**Michael M. Knetter**

NBER Working Paper No. 5878

January 1997

JEL Nos. F1, F3, L1

International Trade and Investment

I study the behavior of newsstand prices for *The Economist* magazine in eight markets. Substantial variations in markups across markets are related to exchange rate fluctuations. Some of this variation can be traced

to menu costs. However, much of the variation appears to result from intentional price discrimination across three regions: the United States, the United Kingdom, and Continental Europe and Scandinavia. Differences in demand elasticities plausibly can be attributed to differences in preferences and the set of competing products across markets. Segmentation of the markets is facilitated by the time-sensitive nature of the product which makes arbitrage very costly.

### **Legal Determinants of External Finance**

**Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny**

NBER Working Paper No. 5879

January 1997

Corporate Finance

Using a sample of 49 countries, we show that countries with poorer investor protections, measured by both the character of legal rules and the quality of law enforcement, have smaller and narrower capital markets. These findings apply to both equity and debt markets. In particular, French civil law countries have both the weakest investor protections and the least developed capital markets, especially as compared to common law countries.

### **Manufacturing Plant Location: Does State Pollution Regulation Matter?**

**Wayne B. Gray**

NBER Working Paper No. 5880

January 1997

JEL Nos. H73, Q28

Productivity, Public Economics

This paper tests whether differences across states in pollution regulation affect the location of manufacturing activity in the United States. I use plant-level data from

the Census Bureau's Longitudinal Research Database to identify births of new plants in each state from 1963–87. This data is combined with several measures of state regulatory intensity, including business spending on pollution abatement, regulatory enforcement activity, congressional pro-environment voting, and an index of state environmental laws. I find a significant connection: states with more stringent environmental regulation have fewer new manufacturing plants. These results persist across a variety of specifications, and the strongest regulatory coefficients are similar in magnitude to those on other factors expected to influence location, such as rates of unionization. However, a subsample of high-pollution industries, which might have been expected to show much larger impacts, gets similar coefficients. This raises the possibility that differences among states other than in environmental regulation might be influencing the results.

### **The Rise and Decline of the American Ghetto**

**David M. Cutler, Edward L. Glaeser, and Jacob L. Vigdor**

NBER Working Paper No. 5881

January 1997

Labor Studies, Public Economics

This paper examines segregation in U.S. cities from 1890 to 1990. We divide the century into three time periods. From 1890 to 1940, ghettos sprung up as blacks migrated to urban areas and cities developed vast expanses filled with housing that was nearly exclusively black. From 1940 to 1970, black migration continued and the ghettos expanded. Since 1970, there has been a decline in segregation, as blacks have moved to suburban areas and central cities have become less segregated. Across all of these time periods, there is a strong positive relation between urban population or density and seg-

regation. We go on to examine why segregation has varied so much over time. We find that the mechanism sustaining segregation has changed. In the mid-20th century, segregation was a product of collective actions taken by whites to exclude blacks from their neighborhoods. By 1990, these legal barriers enforcing segregation had been replaced by decentralized racism, by which whites pay more than blacks in order to live in predominantly white areas.

### **A Portfolio Approach to a Cross-Sectoral and Cross-National Investment Strategy in Transition Economies**

**Willem H. Buiter, Ricardo Lago, and Hélène Rey**

NBER Working Paper No. 5882

January 1997

JEL Nos. P27, G11, G24, G32, F41, F21, E44, D20

International Finance and Macroeconomics and Monetary Economics

This paper takes a systematic look at the portfolio choice problem faced by investment banks or funds investing in transition economies. We relate the performance of projects in the transition economies to the broader macroeconomic and international environment, which affects the project through its input-output structure and its financial balance sheet. Among the macroeconomic determinants of enterprise behavior we consider are: productivity growth; real wage growth; movements in the international terms of trade; shocks to the relative price of traded and nontraded goods; domestic and foreign interest rates; currency depreciation; and the rate of inflation. We evaluate the attractiveness of alternative investment strategies and provisioning rules from the perspective of portfolio theory.

### **Implications of the Great Depression for the Development of the International Monetary System**

**Michael D. Bordo and Barry Eichengreen**

NBER Working Paper No. 5883

January 1997

JEL Nos. F02, F33, E42, N10

Development of the American Economy, International Finance and Macroeconomics, and Monetary Economics

In this paper we speculate about the evolution of the international monetary system in the last two-thirds of the twentieth century absent the Great Depression but with the major post-Depression political and economic upheavals: World War II and the Cold War. We argue that without the Depression the gold-exchange standard of the 1920s would have persisted until the outbreak of World War II. It would have been suspended during the war and for a period of postwar reconstruction before being restored in the first half of the 1950s. The Bretton Woods Conference would not have taken place, nor would a Bretton Woods System of pegged-but-adjustable exchange rates and restrictions on capital-account convertibility have been established. Instead, an unreformed gold-exchange standard of pegged exchange rates and unlimited international capital mobility would have been restored after World War II. But this gold-exchange standard would have collapsed even earlier than was actually the case with Bretton Woods. The move toward floating exchange rates that followed would have taken place well before 1971 in our counterfactual.

We 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.

We then 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 our model simulations and the capital controls regression, we contemplate the implications for institution building and international cooperation of the "no Great Depression" scenario.

### **Cost of Capital for the United States, Japan, and Canada: An Attempt at Measurement Based on Individual Company Records and Aggregate National Accounts Data**

**Albert Ando, John Hancock, and Gary Sawchuk**

NBER Working Paper No. 5884

January 1997

Corporate Finance and Economic Fluctuations and Growth

We lay out a conceptual basis for measuring the cost of capital for corporations from data typically available in such countries as the United States, Canada, and Japan. We attempt to carry out the measurement based both on the accounting records of individual companies and on the aggregate National Accounts data, supplemented by market information on the price of equity shares. We find a consistent pattern for the United States from both sets of data; the real cost of capital after depreciation and before taxes fluctuates around 10 to 11 percent without a persistent trend. For Canada, the individual company data cover too few companies for too short a period to produce reliable estimates. The aggregate National Accounts data for Canada supplemented by some unpublished data supplied by Statistics Canada suggest that the cost of capital in Canada is equal to or somewhat lower than that in the United States.



For Japan, the individual company accounts and National Accounts data yield apparently inconsistent results. We attempt to identify the sources of the inconsistency, although the full clarification of this problem must await the publication by the Economic Planning Agency of a detailed and full explanation of the derivation of its national accounts estimates. Finally, we suggest that the extraordinarily high prices of land and the persistent real capital gains that companies enjoyed on their land until 1990 were an important cause leading to an underestimation of the cost of capital when the standard procedure is applied to Japanese data, and these effects appear to persist.

### **Distributional Effects of Adopting a National Retail Sales Tax**

**Daniel R. Feenberg, Andrew W. Mitrusi, and James M. Poterba**

NBER Working Paper No. 5885

January 1997

JEL Nos. H22, H23, H24

Public Economics

This paper describes a new household-level data file based on merged information from the IRS Individual Tax File, the Current Population Survey, the National Medical Expenditure Survey, and the Consumer Expenditure Survey. This new file includes descriptive data on household income and consumption. The data file can be linked to the NBER TAXSIM program and used to evaluate the distributional effects of changing the federal income tax code, as well as the distributional effects of replacing the individual income tax with a consumption tax. We use this data file to analyze the long-run distributional effects of adopting a national retail sales tax that raises enough revenue to replace the current federal individual and corporation income taxes, as well as federal

estate and gift taxes. Our results highlight the sensitivity of the change in distributional burdens to provisions such as lump sum transfers, sometimes called "demogrants," in the retail sales tax plan, and to the choice between income and consumption as a basis for categorizing households in distribution tables.

### **Business Groups and Trade in East Asia: Part 1, Networked Equilibria**

**Robert C. Feenstra, Deng-Shing Huang, and Gary G. Hamilton**

NBER Working Paper No. 5886

January 1997

JEL Nos. F14, D23

International Trade and Investment

We propose an economic model of business groups that allows for the cooperative behavior of groups of firms, and the number and size of each group to be determined endogenously. In this framework, more than one configuration of groups can arise in equilibrium: several different types of business groups can occur, each of which is consistent with profit maximization and is stable. This means that the economic logic does not fully determine the industrial structure, leaving room for political and sociological factors to have a lasting influence. In a companion paper, we argue that the differing structures of business groups found in South Korea, Taiwan, and Japan fit the stylized results from the model. We contrast the impact of these groups on the product variety of their exports to the United States.

### **Business Groups and Trade in East Asia: Part 2, Product Variety**

**Robert C. Feenstra, Maria Yang, and Gary G. Hamilton**

NBER Working Paper No. 5887

January 1997

JEL Nos. F14, D23

International Trade and Investment

We analyze the impact of market structure on the trade performance of South Korea, Taiwan, and Japan. Korea has many large, vertically-integrated business groups, known as *chaebol*, whereas business groups in Taiwan are smaller and more specialized in the production of intermediate inputs. We test the hypothesis that the greater vertical integration in Korea results in less product variety than for Taiwan by constructing indexes of product variety and "product mix" in exports to the United States. We find that Taiwan tends to export a greater variety of products to the United States than Korea does, and this holds across all industries. In addition, Taiwan exports relatively more high-priced intermediate inputs, whereas Korea exports relatively more high-priced final goods. We also present a comparison with Japan and find that Japan has greater product variety in its sales to the United States than either Taiwan or Korea.

### **Using Maimonides's Rule to Estimate the Effect of Class Size on Scholastic Achievement**

**Joshua D. Angrist and Victor Lavy**

NBER Working Paper No. 5888

January 1997

JEL Nos. I21, J24

Labor Studies

The effect of class size on student achievement has long been of concern to educators, parents, and scholars. In Israeli public schools today,

class size is determined partly using a rule proposed by Maimonides in the 12th century. This rule induces a non-linear and nonmonotonic relationship between enrollment size and class size. We use this relationship to construct estimates of the effect of class size on the test scores of Israeli fourth and fifth graders in 1991 and third graders in 1992. Because the up-and-down pattern in class size induced by Maimonides's rule matches a similar pattern in test scores, the rule provides a credible source of exogenous variation for investigation of the causal effect of class size on student achievement.

Our use of Maimonides's rule can be viewed as an application to the class size question of Campbell's (1969) regression-discontinuity design. Our results show that reductions in class size induce a significant and substantial increase in reading and math scores for fifth graders and a smaller increase in reading scores for fourth graders. In contrast, there is little evidence of any association between class size and the test scores of third graders, although this finding may result from problems with the 1992 wave of the testing program. Our estimates also suggest that the gains from small classes are largest for students from disadvantaged backgrounds. Besides being of methodological interest and providing new evidence on the class size question, these findings are of immediate policy interest in Israel where legislation to reduce the maximum class size is pending.

### **A Distinctive System: Origins and Impact of U.S. Unemployment Compensation**

**Katherine Baicker, Claudia  
Goldin, and Lawrence F. Katz**

NBER Working Paper No. 5889

January 1997

JEL Nos. J0, N0, H7

Development of the American Economy  
and Labor Studies

Unemployment compensation in the United States was signed into law in August 1935 as part of the omnibus Social Security Act. Drafted in a period of uncertainty and economic distress, the portions that dealt with unemployment insurance (UI) were crafted to achieve a multiplicity of goals, among them passage of the Act and a guarantee of its constitutionality. The U.S. unemployment compensation system is distinctive among countries by virtue of its federal-state structure, experience-rating, and limitation on benefits. We contend that these features were products of the times, reflecting expediency more than efficiency, and thus that UI would have been different had it been passed in another decade. But how different is the UI system in the United States because of these features, and how have they affected the U.S. labor market? We show that more seasonality in manufacturing employment in 1909–29 is related to higher UI benefits from 1947 to 1969, if a state's share of manufacturing employment is below the national mean. Lobbying activities of seasonal industries appear important in the evolution of the parameters. We also present suggestive evidence on the relationship between declining seasonality and experience-rating.

### **Towards a Political- Economic Theory of Domestic Debt**

**Allan Drazen**

NBER Working Paper No. 5890

January 1997

JEL Nos. F34, H63

International Finance and  
Macroeconomics

I present a political-economic model of the *composition* of government debt; that is, whether it is issued to domestic or foreign holders. One key determinant will be the political constraints on repudiation of foreign and domestic debt, which will determine the nature of the domestic political equilibrium. Economic and political factors determine the effective cost of borrowing at home or abroad, and with the ability to segment markets, the government acts like a discriminating monopsonist in placing its debt. A country that expects to face a low effective foreign interest rate, reflecting the expectation that it won't be forced to repay its foreign debts in full, will be characterized by high government spending, a high government budget deficit, low domestic saving, and a high trade balance deficit, so that the domestic economy will look mismanaged in terms of a number of macroeconomic indicators. Very lenient foreign assistance programs would have the same effect.

### **Accounting for the Slowdown in Employer Health Care Costs**

**Alan B. Krueger and Helen Levy**

NBER Working Paper No. 5891

January 1997

JEL Nos. J32, I10

Health Care and Labor Studies

The most widely used measure of employer health care costs, the health insurance component of the Employment Cost Index, indicates

that cost growth has decelerated since 1989. In recent years, employer expenditures per hour worked even have declined in nominal dollars. This paper analyzes the components of changes in employers' health care costs over 1992-4 and 1987-93. We find that employer costs have decreased primarily as a result of a steady decrease in the fraction of workers with coverage and a large decrease in the rate of growth of insurance premiums. We conclude that the shift to managed care is not directly responsible for significant cost savings, because managed care premiums are almost as high on average as premiums for fee-for-service plans. Finally, we note that there is a significant need for improved data collection in this area.

**Policy Signaling in  
the Open Economy:  
A Re-examination**  
**Allan Drazen**

NBER Working Paper No. 5892  
January 1997  
JEL Nos. F41, E60  
Economic Fluctuations and Growth  
and International Finance and  
Macroeconomics

The standard model of signaling used in open economy macroeconomics concentrates on building a reputation when a policymaker's "type" is unknown. Observing tough policy leads market participants to raise the probability that a policymaker is tough, and therefore to expect tough policy in the future. This approach does not explain a number of commonly observed occurrences; for example, toughness in defending an exchange rate, leading to increased speculation against the currency. To explain many phenomena, this paper argues, more sophisticated signaling models are needed, models which include signaling of resources rather than preferences, policy affecting the

environment in which signals are sent, and exogenous changes in the environment affecting the informativeness of signals. I explore these models and show that they can explain a number of phenomena that the standard reputational model cannot.

**Inflation Targeting:  
A New Framework for  
Monetary Policy?**

**Ben S. Bernanke and  
Frederic S. Mishkin**  
NBER Working Paper No. 5893  
January 1997  
JEL No. E5  
Economic Fluctuations and Growth  
and Monetary Economics

In recent years a number of industrialized countries have adopted a strategy for monetary policy known as "inflation targeting." We describe how this approach has been implemented in practice and argue that it is best understood as a broad framework for policy, which allows the central bank "constrained discretion," rather than as an ironclad policy rule in the Friedman sense. We discuss the potential of the inflation-targeting approach for making monetary policy more coherent and transparent, and for increasing monetary policy discipline. Our final section addresses some additional practical issues raised by this approach.

**Post-'87 Crash Fears in  
S&P 500 Futures Options**  
**David S. Bates**

NBER Working Paper No. 5894  
January 1997  
Asset Pricing

This paper shows that post-crash implicit distributions have been strongly negatively skewed. I examine two competing explanations: stochastic volatility models with negative correlations between market levels and volatilities; and negative-

mean jump models with time-varying jump frequencies. The two models are nested using a Fourier inversion European option pricing methodology, and fitted to S&P 500 futures options data over 1988-93 using a nonlinear generalized least squares/Kalman filtration methodology. While volatility and level shocks are substantially negatively correlated, the stochastic volatility model can explain the implicit negative skewness only under extreme parameters (for example, high volatility of volatility) that are implausible given the time series properties of option prices. By contrast, the stochastic volatility/jump-diffusion model generates substantially more plausible parameter estimates. I also present evidence against the hypothesis that volatility follows a diffusion.

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

NBER Working Paper No. 5895  
January 1997  
JEL Nos. F13, N72  
Development of the American Economy  
and International Trade and Investment

Four years after passing the infamous Smoot-Hawley tariff in 1930, Congress enacted the Reciprocal Trade Agreements Act (RTAA), which gave the President the authority to undertake tariff-reduction agreements (without Congressional approval) with foreign countries. The resulting trade agreements reduced U.S. tariffs and culminated in the General Agreement on Tariffs and Trade in 1947. Was the Great Depression responsible for bringing about this fundamental shift in U.S. trade policy? This paper analyzes the changes in U.S. trade policy during this period and argues that: (1) the Depression as an *international* phenomenon

motivated the unprecedented Congressional delegation of tariff-making powers; and (2) economic changes that were more the result of World War II than the Depression blunted Republican opposition to the RTAA and ensured its post-war survival.

### **Trade Policy and Economic Development: How We Learn**

**Anne O. Krueger**

NBER Working Paper No. 5896

January 1997

International Finance and Macroeconomics and International Trade and Investment

Ideas about trade policy and economic development have changed radically since the 1950s. Then and now, it was recognized that trade policy was central to the overall design of policies for economic development. But in the early days, there was a broad consensus that trade policy for development should be based on "import substitution." This meant that domestic production of import-competing goods should be undertaken, and increased to satisfy the domestic market, with the necessary incentives provided through the level of protection against imports, or even their prohibition. It was thought that import substitution in manufactures would be synonymous with industrialization, which in turn was seen as the key to development.

The contrast with views today is striking. It is now widely accepted that growth prospects for developing countries are enhanced greatly through an outer-oriented trade regime and fairly uniform incentives (primarily through the exchange rate) for production across exporting and import competing goods.

This paper addresses the changes in thought and policy. How could it happen that a profession, with the principle of comparative advantage

as one of its key tenets, embraced such protectionist policies? What was the contribution of economic research to the sea change in thinking, policy prescriptions, and politicians' acceptance of the need for policy reform? What sorts of economic research best informed the policy process? In a nutshell, how did we learn?

I first sketch the initial approach to trade policy in early research and thought on development. Then I consider the evolution of thought, research, and experience with respect to trade and development over the next several decades, up to the "conventional wisdom" of the 1990s. Finally, I examine the role of research and the type of research that proved most fruitful in guiding policy and changing the consensus.

### **Per Capita Income Convergence and the Role of International Trade**

**Matthew J. Slaughter**

NBER Working Paper No. 5897

January 1997

JEL Nos. F1, O4

International Trade and Investment

The recent literature on cross-country convergence of per capita income largely has ignored international trade. The reason might be perspective. Most papers about convergence frame the analysis in a "Solow world" in which countries exist independent of one another. But most international trade economists have a very different perspective of a world in which countries exchange goods, factors, and ideas. This paper sketches out some basic relationships between the convergence of per capita income and international trade. First, I briefly summarize a few interesting recent papers that have linked income convergence to trade. Their common inference is that for countries that are somehow linked by trade *and* con-

verging, trade helps to cause the convergence. Second, I critique these papers in light of some simple accounting and trade theory. The key point here is that the fact of countries trading is not sufficient proof that trade helps to cause per capita income convergence. Finally, I give two examples that apply some of these ideas to real-world data. The basic point of this paper is that more work is needed to document carefully both the exact mechanisms by which trade helps convergence and the relative contribution of trade and non-trade factors.

### **A Simple Model of Trade, Capital Mobility, and the Environment**

**Brian R. Copeland and M. Scott Taylor**

NBER Working Paper No. 5898

January 1997

International Trade and Investment

This paper examines the interaction between relative factor abundance and income-induced policy differences in determining the pattern of trade and the effect of trade liberalization on pollution. If a rich and capital abundant North trades with a poor and labor abundant South, then free trade lowers world pollution. Trade shifts the production of pollution-intensive industries to the capital abundant North despite its stricter pollution regulations. Pollution levels rise in the North and fall in the South. These results can be reversed, however, if the North-South income gap is "too large"; in that case, the pattern of trade is driven by income-induced pollution policy differences across countries. Capital mobility may raise or lower world pollution depending on the pattern of trade.

## **Order from Chaos? The Effects of Early Labor Market Experiences on Adult Labor Market Outcomes**

**Rosella Gardecki and David Neumark**

NBER Working Paper No. 5899

January 1997

JEL Nos. J24, J31, J6

Labor Studies

This paper examines the consequences of initial periods of “churning,” “floundering about,” or “mobility” in the labor market to help assess whether faster transitions to stable employment relationships — such as those envisioned by advocates of school-to-work programs — would be likely to lead to better adult outcomes in the labor market. Our interpretation of the results is that there is at best modest evidence linking early job market stability to better outcomes in the labor market. We find that for both men and women, adult labor market outcomes (that is, what happens to workers in their late-20s or early-to-mid-30s) for the most part are unrelated to early labor market experiences. This does not provide a compelling case for efforts to explicitly target the school-to-work transition, in that it would mean changing the structure of youth labor markets so that workers become more firmly attached to employers, industries, or occupations at younger ages.

## **Financial Factors and Investment in Belgium, France, Germany, and the UK: A Comparison Using Company Panel Data**

**Stephen Bond, Julie Elston, Jacques Mairesse, and Benoît Mulkey**

NBER Working Paper No. 5900

January 1997

JEL Nos. C23, D21, E22, G31

Productivity

We construct company panel datasets for manufacturing firms in Belgium, France, Germany, and the United Kingdom, covering 1978–89. We use these datasets to estimate a range of investment equations, and to investigate the role played by financial factors in each country. We find that cash flow or profits appear to be both statistically and quantitatively more significant in the United Kingdom than in the three continental European countries. This is consistent with the suggestion that financial constraints on investment may be relatively severe in the more market-oriented U.K. financial system.

## **A Century of Global Stock Markets**

**William N. Goetzmann and Philippe Jorion**

NBER Working Paper No. 5901

January 1997

JEL Nos. F30, G11

Asset Pricing

The expected return on equity capital may be the most important driving factor in asset allocation decisions. Yet, the long-term estimates we typically use are derived only from U.S. data. There are reasons to suspect, however, that these estimates of return on capital are subject to survivorship, since the United States is arguably the most successful capitalist system in the world; most other countries have been plagued by political upheaval, war, and financial crises.

This paper provides estimates of return on capital from long-term histories for world equity markets. By putting together a variety of sources, we collected a database of capital appreciation indexes for 39 markets with histories going as far back as the 1920s.

Our results are striking. We find that the United States has by far the highest uninterrupted real rate of appreciation of all countries, at about

5 percent annually. For other countries, the median real appreciation rate is about 1.5 percent. The high return premium obtained for U.S. equities therefore appears to be the exception rather than the rule.

Our global database also allows us to reconstruct monthly real and dollar-valued capital appreciation indexes for global markets, providing further evidence of the benefits of international diversification.

## **The Influence of Income Tax Rules on Insurance Reserves**

**David F. Bradford and Kyle D. Logue**

NBER Working Paper No. 5902

January 1997

JEL Nos. G22, G38, H25

Public Economics

Federal income tax rules, and especially changes in those rules, combine with circumstances in the financial market (for example, interest rates) to create incentives that affect property-casualty insurers' decisions about the level of loss reserves to report. These incentives have varied substantially since 1980. In particular, the transition effects of the Tax Reform Act of 1986 created unusually large incentives to overstate reserves in reporting years 1985–7. Because they are in a sense forecasts of quite variable quantities, reserves are inevitably subject to correction over time, which makes drawing inferences from the time-series evidence difficult. Furthermore, taxes are not the only sources of biasing incentives that may vary from time to time. Still, the picture in aggregate industry data presented in this paper is broadly consistent with the tax-motivated reserving hypothesis.

## **Orchestrating Impartiality: The Impact of "Blind" Auditions on Female Musicians**

**Claudia Goldin and Cecilia Rouse**

NBER Working Paper No. 5903

January 1997

JEL Nos. J7, J2, J4

Labor Studies

Discrimination against women has been alleged in hiring practices for many occupations, but it is extremely difficult to demonstrate sex-biased hiring. A change in the way symphony orchestras recruit musicians provides an unusual way to test for sex-biased hiring. To overcome possible biases in hiring, most orchestras revised their audition policies in the 1970s and 1980s. A major change involved the use of "blind" auditions with a "screen" to conceal the identity of the candidate from the jury. Female musicians in the top five symphony orchestras in the United States were less than 5 percent of all players in 1970 but are 25 percent today. We ask whether women were more likely to be advanced and/or hired with the use of "blind" auditions. Using data from actual auditions, we find that the screen increases — by 50 percent — the probability that a woman will be advanced out of certain preliminary rounds. The screen also greatly enhances the likelihood that a female contestant will be the winner in the final round. Using data on orchestra personnel, we find that the switch to "blind" auditions can explain between 30 percent and 55 percent of the increase in the proportion that is female among new hires, and between 25 percent and 46 percent of the increase in the percentage that is female in the orchestras since 1970.

## **The Valuation of the Foreign Income of U.S. Multinational Firms: A Growth-Opportunities Perspective**

**Gordon M. Bodnar and  
Joseph Weintrop**

NBER Working Paper No. 5904

January 1997

JEL Nos. F3, M4

International Finance and

Macroeconomics

This paper demonstrates the "value-relevance" of foreign earnings for U.S. multinational firms. We examine the association between annual abnormal stock performance and changes in firms' domestic and foreign incomes as disclosed through SEC Regulation §210.4-08(h). For 2,570 firm-year observations between 1985 and 1993, changes in both foreign and domestic earnings are significantly positively associated with measures of annual excess returns; however, the coefficient for association on foreign income is significantly larger than the coefficient on domestic income. This indicates that disclosures of foreign earnings are value-relevant, and suggests that firm value is more sensitive to foreign earnings than to domestic earnings. We demonstrate that this larger foreign association coefficient is consistent with differences in growth opportunities between domestic and foreign operations. To further support the growth-opportunity interpretation of the results, we demonstrate that larger coefficients on foreign association are not caused by exchange rate changes or by methodological problems, such as differences in the timing of foreign versus domestic earnings recognition, or misspecification in the earnings expectation process.

## **Trade, Social Insurance, and the Limits to Globalization**

**Dani Rodrik**

NBER Working Paper No. 5905

January 1997

JEL Nos. F10, F13

International Finance and

Macroeconomics and International

Trade and Investment

International economic integration increases exposure to external risk and intensifies domestic demands for social insurance through government programs. But international economic integration also reduces the ability of governments to respond to such pressure by rendering the tax base "footloose." With globalization proceeding apace, the social consensus required to maintain domestic markets open to trade may erode to the point where a return to protection becomes a serious possibility.

## **Re-emerging Markets William N. Goetzmann and Philippe Jorion**

NBER Working Paper No. 5906

January 1997

JEL Nos. F30, G11

Asset Pricing

Recent research shows that emerging markets are distinguished by high returns and low covariances with global market factors. These are striking results because of their immediate implications for the international investor. One key issue is whether these results may be attributed to recent emergence.

Most of today's emerging markets are actually *re-emerging markets*, that is, markets that attracted international attention earlier in the century, and for various political, economic, and institutional reasons experienced discontinuities in data sources.

To analyze the effects of conditioning on recent emergence, we simulate a simple, general model of global markets in which markets are priced according to their exposure to a world factor; returns are observed only if the price level exceeds a threshold at the end of the observation period. The simulations reveal a number of new effects. In particular, we find that the brevity of a market history is related to the bias in annual returns as well as to the world beta. These patterns are confirmed by long-term histories of global capital markets and by recent empirical evidence on emerging and submerged markets. Even though these results also can be explained by alternative theories, the common message is that basing investment decisions on the past performance of emerging markets is likely to lead to disappointing results.

**Default and Renegotiation:  
A Dynamic Model of Debt**  
**Oliver Hart and John Moore**

NBER Working Paper No. 5907  
January 1997  
JEL Nos. D21, G32, G33  
Corporate Finance

We analyze the role of debt in persuading an entrepreneur to pay out cash flows, rather than to divert them. In the first part of the paper, we study the optimal debt contract — specifically, the trade-off between the size of the loan and the repayment — under the assumption that some debt contract is optimal. In the second part, we consider a more general class of (non-debt) contracts, and derive sufficient conditions for debt to be optimal among them.

**NBER Historical Papers**

**Immigrants and Natives:  
Comparative Economic  
Performance in the U.S.,  
1850–60 and 1965–80**

**Joseph P. Ferrie**

NBER Historical Paper 93  
September 1996  
JEL Nos. J61, N30, F22  
Development of the American Economy

Immigrants who arrived in the United States before the Civil War, unlike recent immigrants, were less likely to live in areas with high immigrant concentrations as their stay in the United States went on. The reduced isolation of these antebellum immigrants was not attributable to their own movement to places with fewer immigrants, but rather to the movement of the native-born into places (particularly cities) with large concentrations of immigrants. The isolation of contemporary immigrants even after several years in the United States thus results more from the reluctance of the native-born to relocate to places with many immigrants than from their own reluctance to move to places with fewer immigrants. Contemporary immigrants did have more success than antebellum immigrants in avoiding unskilled jobs as they entered the U.S. job market, although they moved out of unskilled jobs less often than the antebellum immigrants, according to comparisons of occupations at two points in time after arrival in the United States. Improvements in occupational mobility between antebellum and recent immigrants were most apparent among those not in unskilled jobs. This suggests the need to reevaluate some of the premises upon which concerns about the economic performance of recent immigrants are based.

**The Efficiency  
Consequences of  
Institutional Change:  
Financial Market  
Regulation and Industrial  
Productivity Growth in  
Brazil, 1866–1934**

**Stephen Haber**

NBER Historical Paper 94  
November 1996  
Development of the American Economy

This paper examines one of the central hypotheses of the New Institutional Economics: that the reform of institutions — in this case, the rules and regulations enforced by the State that both permit and bound the operation of markets — is crucial for the process of economic growth. I examine this hypothesis by estimating the productivity gain afforded to Brazilian textile firms by the reform of the regulations governing Brazil's securities markets in 1890. This analysis is based on panel data regressions on 18 firm-level censuses covering 1866–1934; this allows me to decompose total factor productivity growth. These censuses cover both limited liability joint stock corporations and privately owned firms. I also analyze corporate financial statements and stock market data for publicly held firms covering the period 1895–1940. I argue that the reform of the regulations pertaining to limited liability and mandatory disclosure permitted the widespread use of Brazil's debt and equity markets to mobilize capital for industry. This meant that the capital constraints faced by firms prior to the 1890s were relaxed. The result was an increased rate of investment, a decline in industrial concentration, and accelerated rates of growth of productivity.

**The Political Economy of  
Workers' Compensation  
Benefit Levels, 1910–1930**  
Price V. Fishback and  
Shawn E. Kantor

NBER Historical Paper 95  
November 1996  
JEL Nos. J38, K31, N41, N42  
Development of the American Economy

Although by 1910 workers, employers, and insurance companies all supported the adoption of workers' compensation, they fiercely debated the specific features of the legislation. We examine how levels of workers' compensation benefits were determined in the political process of forging compromises across interest groups, and even within individual groups. A quantitative analysis of the benefit levels in each state between the time of adoption and 1930 shows several important trends: Employers in dangerous industries effectively imposed limits on accident benefits, while organized labor and the commissions that administered the laws were instrumental in achieving higher expected levels of benefits. Political reformers who gained control of state legislatures in the early twentieth century aided organized labor in achieving its goal of improving workers' compensation accident benefits. We also present case studies of the political struggle over benefits that occurred in three states: Ohio, Minnesota, and Missouri. These qualitative descriptions of the fight over benefit levels provide a more detailed picture of the political process through which workers' compensation was created, because the cross-state quantitative study largely overlooks the political nuances that shaped workers' compensation legislation.

**NBER Technical Papers**

**Hierarchical Bayes Models  
with Many Instrumental  
Variables**

Gary Chamberlain and  
Guido W. Imbens

NBER Technical Working Paper 204  
September 1996  
Labor Studies

In this paper, we explore Bayesian inference in models with many instrumental variables that potentially are correlated only weakly with the endogenous regressor. The prior distribution has a hierarchical (nested) structure. We apply the methods to the Angrist-Krueger 1991 analysis of returns to schooling, using instrumental variables formed by interacting quarter of birth with state/year dummy variables. Bound, Jaeger, and Baker (1995) show that randomly generated instrumental variables, designed to match the AK dataset, yield two-stage least squares results similar to the results based on the actual instrumental variables. Using a hierarchical model with the AK data, we find a posterior distribution for the parameter of interest that is tight and plausible. Using data with randomly generated instruments, the posterior distribution is diffuse. Most of the information in the AK data in fact can be extracted with quarter of birth as the single instrumental variable. Using artificial data patterned on the AK data, we find that if all the information had been in the interactions between quarter of birth and state/year dummies, then the hierarchical model still would have led to precise inferences, whereas the single instrument model would have suggested that there was no information in the data. We conclude that hierarchical modeling is a conceptually straightforward way of efficiently combining many weak instrumental variables.

**The NBER Manufacturing  
Productivity Database**

Eric J. Bartelsman and  
Wayne Gray

NBER Technical Working Paper 205  
October 1996  
JEL No. D24  
Productivity

This paper provides technical documentation to accompany the NBER manufacturing productivity (MP) database. The database contains information on 450 four-digit manufacturing industries for 1958 through 1991. The data are compiled from various official sources, most notably the Annual Survey of Manufactures and the Census of Manufactures. We also provide estimates of total factor productivity (TFP) growth for each industry. The paper further discusses alternate methods of deflation and aggregation and their impact on TFP calculations.

**Further Investigation of the  
Uncertain Unit Root in GNP**  
Yin-Wong Cheung and  
Menzie D. Chinn

NBER Technical Working Paper No. 206  
November 1996  
JEL Nos. C15, C22  
International Finance and  
Macroeconomics

We apply a more powerful version of the ADF test and a test that has trend stationarity as the null to U.S. GNP. We use simulated critical values generated from plausible trend and difference stationary models in order to minimize possible finite sample biases. We evaluate the discriminatory power of the two tests using alternative-specific rejection frequencies. For post-War quarterly data, these two tests do not provide a definite conclusion. However, when we analyze annual data over the period 1869–1986, the unit root null is rejected, while the trend stationary null is not.



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