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# NBER Reporter

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## Program Report

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## International Finance and Macroeconomics (IFM)

Jeffrey A. Frankel\*

In 2003, the Program in International Finance and Macroeconomics celebrated its tenth anniversary as a separate program of the NBER. Research on emerging market countries represents a rapidly growing share of the agenda of the NBER's IFM Program. While members of the Program continue to work on many other topics as well, this article focused on the last four years will concentrate on the emerging markets theme. This research includes a major project, directed by Martin Feldstein and me, on “Financial Crises in Emerging Markets.” This project in turn included eight meetings on crises in specific countries — the Mexican crisis of 1994, the East Asian crises during 1997-8, through Argentina's crash in 2001 — along with many other conferences.<sup>1</sup> It produced eight NBER books.<sup>2</sup>

### Institutions

Economists' interest in those countries that have become integrated into world financial markets over the last few decades can be seen as part of a larger increase in attention paid to developing countries in general. The field of development economics has recently been granted more of the priority and prestige that it deserves. Why some poor countries have been able to join the ranks of the rich and others have stayed behind is one of the most important questions of our time. Research on the deepest determinants of growth now emphasizes three strong influences: openness to trade; tropical geography; and, especially, the quality of a country's institutions, such as protection of property rights, efficacy of the legal system, and absence of corruption.<sup>3</sup> Financial market institutions, such as those charged with protection of shareholder rights, receive particular emphasis.<sup>4</sup> Shang-Jin Wei and his co-authors document that corruption in a country makes foreign investors skittish.<sup>5</sup>

Research by members of the IFM Program tends most often to deal specifically with macroeconomic questions, such as the choice of

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monetary and exchange rate policy, or a country's decision whether to open its financial markets to international capital flows. But Daron Acemoglu, Simon Johnson, James Robinson, and Yunyong Thaicharoen argue that macroeconomic policies in developing countries are often the manifestation of deeper institutions and interest groups.<sup>6</sup> For example, an IMF requirement that a country devalue in order to raise the domestic price of export commodities may be offset simply by some other policy to restore the preceding political equilibrium. Some of the more interesting findings discussed in this article concern the *interaction* of countries' institutions with these macroeconomic decisions.

## Exchange Rate Regimes

One major question addressed by IFM members is a country's choice of currency regime: a fixed exchange rate, a floating exchange rate, or a regime with an intermediate degree of flexibility (such as a target zone). The debate is an old one, but it acquired some new features in the late 1990s. One new development was the decision of some countries to abandon their independent currency for a device to fix its value firmly, such as a currency board or official dollarization. Sebastian Edwards and Igal Magendzo find that dollarization and currency unions have delivered lower inflation, as promised, but with higher income volatility.<sup>7</sup>

One of the arguments for a firm fix was that it would force domestic institutions to evolve in a favorable way, and would help prevent the chronic monetization of fiscal deficits that had undone so many previous attempts at macroeconomic stabilization.<sup>8</sup> Argentina's currency board, for example, appeared to work very well during most of the decade. It was believed that this "convertibility plan" had encouraged reforms that by the late 1990s had turned Argentina's banking system into one of the best among all emerging markets.<sup>9</sup> But when Argentina's crisis crested in 2001, neither the supposedly deep pockets of foreign parents that had been allowed local bank subsidiaries<sup>10</sup>, nor any of the country's other innovative reforms, were able to protect its banking system. This outcome can only have had a dampening effect on the earlier enthusiasm for currency boards.<sup>11</sup>

Another new argument for monetary union has been the influential empirical findings of Andrew K. Rose and his co-authors that the boost to bilateral trade has been significant, and larger (as large as a threefold

increase) than had been assumed previously.<sup>12</sup> Many others have advanced critiques of the Rose research, but the basic finding has withstood perturbations and replications remarkably well, even though the estimated magnitudes are sometimes smaller.<sup>13</sup> Some developing countries seeking enhanced regional integration may now try to follow Europe's lead.<sup>14</sup>

There are plenty of arguments in favor of floating currencies as well, and most of the victims of the last eight years of crises in emerging markets have responded by increasing exchange rate flexibility. One advantage that is beginning to receive renewed emphasis is that floaters are partially insulated against fluctuations in the world market for their exports.<sup>15</sup>

A relatively new realization is that attempts to categorize countries' choice of regime (into fixed, floating, and intermediate) in practice differ from the official categorization.<sup>16</sup> Countries that say they are floating, for example, in reality often are not.<sup>17</sup> Indeed, neat categorization may not be possible at all. That Argentina was in the end forced to abandon its currency board, in 2001, also dramatizes the lesson that the choice of exchange rate regime is not as permanent or deep as had previously been thought.<sup>18</sup> The choice of exchange rate regime is more likely endogenous with respect to institutions, rather than the other way around.<sup>19</sup> The "corners hypothesis" — that countries are, or should be, moving away from the intermediate regimes, in favor of either the hard peg corner or the floating corner — became fashionable in the late 1990s; but it is now another possible casualty of the realization that no regime choice is in reality permanent, and that investors know that.<sup>20</sup>

If a country decides against setting a target for the exchange rate, that still leaves the question of what alternative target or targets will guide monetary policy instead, as Lars E. O. Svensson has emphasized. Setting a target for the money supply is no longer in fashion, for good reason.<sup>21</sup> One popular alternative is inflation targeting.<sup>22</sup> Another is the Taylor rule.<sup>23</sup> An open area for research is whether and how such rules can be adapted for the

special circumstances facing emerging market countries, such as lower credibility of their monetary institutions.<sup>24</sup>

## Opening up Financial Markets

Another major question that a country must decide is whether to liberalize financially, and in particular how much to remove controls on international capital movements. This is part of the larger debate over globalization. Do the advantages of open financial markets outweigh the disadvantages?<sup>25</sup> There are many potential gains from international trade in financial assets, analogous to the gains from international trade in goods. Peter B. Henry and Anusha Chari, for example, have shown that when countries open their stock markets, the cost of capital facing domestic firms falls (stock prices rise), with a positive effect on their investment and on economic growth.<sup>26</sup> Controls designed to moderate capital inflows thus may raise the cost of capital and slow growth. They may have a particular impact on small firms.<sup>27</sup>

Nevertheless, financial liberalization has often been implicated in the crises experienced by emerging markets over the last ten years. Certainly a country that does not borrow from abroad in the first place cannot have an international debt crisis. Perhaps, then, there is a role for capital controls. Dani Rodrik finds that Malaysia's decision to impose controls on outflows in 1998 helped it weather the Asia crisis.<sup>28</sup> But Johnson and Todd Mitton find that Malaysian capital controls mainly worked to provide a screen behind which politically favored firms could be supported.<sup>29</sup> Research more often has been sympathetic to a specific kind of capital control — Chile-style penalties on short-term capital *inflows* — under the theory that they tilt the composition in favor of more stable long-term inflows.<sup>30</sup>

A blanket indictment (or vindication) of international capital flows would be too simplistic. Some of the most interesting research examines the circumstances under which financial liberalization is more likely to be good (or bad) for economic performance.

One claim is that financial opening lowers volatility<sup>31</sup> and raises growth<sup>32</sup> only for rich countries, and is more likely to lead to market crashes in lower-income countries.<sup>33</sup> A second claim is that capital account liberalization raises growth only in the absence of macroeconomic imbalances, such as overly expansionary monetary and fiscal policy.<sup>34</sup> A third important finding is that institutions, such as shareholder protection and accounting standards, determine whether liberalization leads to development of the financial sector,<sup>35</sup> and in turn to long-run growth.<sup>36</sup> A related finding is that corruption tilts the composition of capital inflows toward the form of banking flows (and away from foreign direct investment), and toward dollar denomination (versus denomination in domestic currency), both of which have been associated with crises.<sup>37</sup> The implication is that financial liberalization can help if institutions are strong and other fundamentals are favorable, but can hurt if they are not.

All of these findings are consistent with the conventional lesson about the sequencing of reforms: that countries will do better in the development process if they postpone opening the capital account until after other institutional reforms.<sup>38</sup> Of course, the observable positive correlation between the opening of capital markets and growth could be attributable to reverse causation — that rich countries liberalize as a result of having developed, not because of it — but Hali Edison and his co-authors conclude from their own tests that this is not the case.<sup>39</sup>

## Origins of Currency Crises

What are the sources of crises in emerging markets, and why have they so often led to sharp recessions? Levels of debt that would not necessarily seem high by the standards of rich countries get some "debt-intolerant" developing countries into repeated trouble.<sup>40</sup> When a poor country runs into difficulty, the international financial community demands that it cut its deficits, while everyone accepts that rich countries will run larger deficits when in recession. What explains the key difference between

global investors' treatment of developing versus developed countries.<sup>41</sup> The traditional explanation is macroeconomic fundamentals.<sup>42</sup> But this does not seem to fit for some of the recent crises, inspiring models with multiple equilibriums (a country may get shifted to a crisis equilibrium even if its leaders do not initiate unsound economic policies).<sup>43</sup> There are also models that feature herding<sup>44</sup>, bubbles<sup>45</sup>, and a particular role for mutual funds<sup>46</sup> and other large investors in speculative attacks.<sup>47</sup>

One prime culprit is the inability of developing countries to borrow internationally in terms of their own currency, termed by Barry Eichengreen and Ricardo Hausmann the problem of "original sin."<sup>48</sup> Firms or banks that incur liabilities in dollars or other foreign currencies while their revenues are primarily in domestic currency face the problem of currency mismatch; this in turn can lead to insolvency and contraction when the domestic currency devalues sharply.<sup>49</sup> These balance sheet effects are at the center of many analyses.<sup>50</sup>

Banks, in particular, have been implicated in most crises, usually because of the acute problem of moral hazard created by the prospect of government bailouts.<sup>51</sup> Foreign direct investment is a less risky source of capital inflow than loans;<sup>52</sup> the same is true of equity flows.<sup>53</sup>

IFM researchers have devoted a lot of attention to the observed correlation of financial volatility across emerging markets. Part of the correlation can be explained by common external shocks, such as variation in U.S. interest rates.<sup>54</sup> But some of the correlation is what is often called contagion of crises.<sup>55</sup> Jessica Tjornhom Donohue and Kenneth A. Froot note the high persistence of portfolio flows of institutional investors across emerging markets and individual investment funds, and decompose the source of this persistence into a cross-country, cross-fund component, which might arise from contagion, versus other components.<sup>56</sup> Graciela Kaminsky and Carmen M. Reinhart find that when contagion spreads across continents, it passes through major financial centers along the way.<sup>57</sup> Kristin Forbes finds

that contagion also spreads along the lines of trade linkages.<sup>58</sup>

## Response to Crises

Once a country is hit by an abrupt cut-off in foreign willingness to lend — a "sudden stop"<sup>59</sup> — it hardly matters what the cause was. The urgent question becomes: what is the appropriate policy response? Often the loss in foreign financing must be taken as given. Thus there must be a reduction of the same magnitude in the previous trade deficit. How can the adjustment be accomplished? Is a sharp increase in interest rates preferable to a sharp devaluation?<sup>60</sup> Many victims of crises in the late 1990s had to experience both. Regardless of what mix of policies has been chosen, recessions have been severe.<sup>61</sup> Further questions of interest include: Is the output loss smaller if the country goes to the International Monetary Fund?<sup>62</sup> What are the impacts of IMF and World Bank programs on income distribution?<sup>63</sup> What are "best practices" for domestic financial restructuring?<sup>64</sup>

Even though many currency crises over the last ten years have led to larger than expected output losses, one encouraging pattern has been that inflation usually has responded to devaluations much less than expected.<sup>65</sup> The traditional view had been that countries, especially small countries, experience rapid pass-through of exchange rate changes into import prices, and then to the general price level.<sup>66</sup> But this assumption appears to have become less valid. Ariel Burstein, Martin S. Eichenbaum, and Sergio Rebelo find that the price indexes are kept down by substitution away from imports toward cheaper local substitutes.<sup>67</sup> The pass-through debate recently has focused on a comparison of the alternatives of producers pricing in their own currency versus local currency, in the context of the new open economy macroeconomic models, where all decisions are based on optimizing behavior.<sup>68</sup> Charles Engel has questioned the validity of the assumption of producer-currency pricing, and in turn questioned the validity of the role of the exchange rate as an effective mechanism of trade balance adjust-

ment.<sup>69</sup> But Maurice Obstfeld argues that even if consumers face prices that are unchanged in local currency, devaluations spur adjustment through other channels, such as firms' decisions to switch their source of imported inputs.<sup>70</sup>

The question of whether to adjust to a current account deficit by devaluing or by other means takes the necessity of adjustment as given, a consequence of the sudden stop in foreign financing. But what if the magnitude of the loss in foreign financing is not a given? Alternatives include default, debt-reduction, forgiveness, rescue packages by the IMF, and arm-twisting of private investors to continue their exposure (called Private Sector Involvement). In this case, policy decisions made by the U.S. government<sup>71</sup> and other members of the G-7<sup>72</sup> are central. On the one hand, the IMF moderates the severity of crises by acting as a kind of international lender of last resort, even though its resources are proportionately far smaller than the traditional domestic lender of last resort.<sup>73</sup> On the other hand, IMF bailouts often are criticized for making the problems worse in the long run, because of moral hazard.<sup>74</sup> IMF plans to institute a Sovereign Debt Restructuring Mechanism — a sort of international bankruptcy court — recently have succumbed to strong resistance.<sup>75</sup> Instead, some prominent emerging market countries have added "Collective Action Clauses" to their bond contracts, inspired in part by Eichengreen's arguments that this is a realistic way to accomplish private sector involvement without the worst of the moral hazard problems of IMF bailouts.<sup>76</sup>

Debt-reduction<sup>77</sup> seemed to help many developing countries put the 1980s debt crisis behind them (the Brady Plan of 1989). Can it do the same today?<sup>78</sup> A recurrent puzzle is why more countries don't default on their debts.<sup>79</sup> Rose finds that bilateral debt reschedulings lead to losses of trade along corresponding bilateral lines estimated at 8 percent a year for 15 years, from which he infers that lost trade is the motivation debtors have to avoid such defaults.<sup>80</sup> Michael Dooley has suggested provocatively that deep recessions, which most observers con-

sider an undesirable effect of crises, exist for a reason: they are the system's way of assuring investors that debtors have an incentive to avoid default.<sup>81</sup> Despite the usual view that the global system has a long-run interest in punishing defaults, recent developments in Iraq have led Michael Kremer to propose an exception: if it can be impartially ascertained what ruler (like Saddam Hussein) constitutes an oppressive tyrant, then the international community could encourage successor regimes to default on the debt that their countries inherit; such a system would work to reduce the credit access of future tyrants.<sup>82</sup>

<sup>1</sup> For reports on these meetings and the rest of the project, go to <http://www.nber.org/crisis/>.

<sup>2</sup> See <http://www.nber.org/crisis/#books>.

<sup>3</sup> Important examples include D. Acemoglu, S. Johnson, and J. Robinson, "The Colonial Origins of Comparative Development: An Empirical Investigation" NBER Working Paper No. 7771, June 2000; D. Rodrik, A. Subramanian, and F. Trebbi, "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development" NBER Working Paper No. 9305, November 2002; and J. D. Sachs, "Institutions Don't Rule: Direct Effects of Geography on Per Capita Income," NBER Working Paper No. 9490, February 2003.

<sup>4</sup> S. Johnson, J. McMillan, and C. Woodruff, "Property Rights and Finance," NBER Working Paper No. 8852, March 2002. Examples for equity markets include R. La Porta, F. Lopez-de-Silanes, and A. Shleifer, "What Works in Securities Markets?" NBER Working Paper No. 9882, August 2003; A. Shleifer and D. Wolfenson, "Investor Protection and Equity Markets," NBER Working Paper No. 7974, October 2000; and R. La Porta, F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny, "Investor Protection: Origins, Consequences, and Reform," NBER Working Paper No. 7428, December 1999.

<sup>5</sup> R. G. Gelos and S. Wei, in "Transparency and International Investor Behavior," NBER Working Paper No. 9260, October 2002, find that investors respond negatively to corruption. J. Du and S. Wei, in "Does Insider Trading Raise Market Volatility?" NBER Working Paper No. 9541, March 2003, find that countries with more insider trading have more variable stock markets.

<sup>6</sup> D. Acemoglu, S. Johnson, J. Robinson, and

Y. Thaicharoen, "Institutional Causes, Macroeconomic Symptoms: Volatility, Crises and Growth," NBER Working Paper No. 9124, August 2002; published in *Journal of Monetary Economics*, (2002).

<sup>7</sup> S. Edwards and I. I. Magendzo, "Strict Dollarization and Economic Performance: An Empirical Investigation," NBER Working Paper No. 9820, July 2003; and "A Currency of One's Own? An Empirical Investigation of Dollarization and Independent Currency Unions," NBER Working Paper No. 9514, February 2003.

<sup>8</sup> E. G. Mendoza, "Why Should Emerging Economies Give up National Currencies: A Case for Institutions Substitution," NBER Working Paper No. 8950, May 2002.

<sup>9</sup> L. J. Alston and A. Gallo, "Evolution and Revolution in the Argentine Banking System under Convertibility: The Roles of Crises and Path Dependence," NBER Working Paper No. 8008, November 2000; and C. W. Calomiris and A. Powell, "Can Emerging Market Bank Regulators Establish Credible Discipline? The Case of Argentina, 1992-1999," NBER Working Paper No. 7715, May 2000.

<sup>10</sup> L. Goldberg, B. G. Dages, and D. Kinney, "Foreign and Domestic Bank Participation in Emerging Markets: Lessons from Mexico and Argentina," NBER Working Paper No. 7714, May 2000.

<sup>11</sup> S. Edwards, "The Great Exchange Rate Debate After Argentina," NBER Working Paper No. 9257, October 2002.

<sup>12</sup> The already-classic paper is A. K. Rose, "One Money, One Market: Estimating the Effects of Common Currency on Trade," NBER Working Paper No. 7432, December 1999, published in *Economic Policy*, (2000). Follow-ups include R. Glick and A. K. Rose, "Does a Currency Union Affect Trade?: The Time-Series Evidence," NBER Working Paper No. 8396, July 2001; and J. A. Frankel and A. K. Rose "Estimating the Effects of Currency Unions on Trade and Output," NBER Working Paper No. 7857, August 2000, published in *Quarterly Journal of Economics*, (2002).

<sup>13</sup> For example, S. Tenreiro and R. J. Barro, "Economic Effects of Currency Unions," NBER Working Paper No. 9435, January 2003.

<sup>14</sup> Barry Eichengreen and Alan M. Taylor argue that the true lesson of EMU is that monetary unions are adopted for political reasons, not economic. See "The Monetary Consequences of a Free Trade Area of the

Americas," NBER Working Paper No. 9666, May 2003.

<sup>15</sup> Among peggers, terms-of-trade shocks are amplified and long-run growth is reduced, as compared to flexible-rate countries, according to S. Edwards and E. L. Yeyati, "Flexible Exchange Rates as Shock Absorbers," NBER Working Paper No. 9867, July 2003.

<sup>16</sup> For example, C. M. Reinhart and K. S. Rogoff, "The Modern History of Exchange Rate Arrangements: A Reinterpretation," NBER Working Paper No. 8963, May 2002.

<sup>17</sup> G. A. Calvo and C.M. Reinhart, "Fear of Floating," NBER Working Paper No. 7993, November 2000; published in *Quarterly Journal of Economics*, (2002).

<sup>18</sup> I review all of these issues in "Experience of and Lessons from Exchange Rate Regimes in Emerging Economies," NBER Working Paper No. 10032, October 2003.

<sup>19</sup> A. Alesina and A. Wagner, "Choosing (and Reneging on) Exchange Rate Regimes," NBER Working Paper No. 9809, June 2003; and G. A. Calvo and F. S. Mishkin, "The Mirage of Exchange Rate Regimes for Emerging Market Countries," NBER Working Paper No. 9808, June 2003.

<sup>20</sup> For example, C. M. Reinhart and V. R. Reinhart, "Twin Fallacies about Exchange Rate Policy in Emerging Markets," NBER Working Paper No. 9670, May 2003.

<sup>21</sup> Andrew Atkeson and Patrick J. Kehoe argue that money targeting does not allow the public to monitor central bank behavior as well as exchange rate targeting does. See "The Advantage of Transparent Instruments of Monetary Policy," NBER Working Paper No. 8681, December 2001.

<sup>22</sup> For example, L. E. O. Svensson, "Monetary Policy and Real Stabilization," NBER Working Paper No. 9486, February 2003, and "Inflation Targeting: Should it be Modeled as an Instrument Rule or as a Target Rule?" NBER Working Paper No. 8925, May 2002.

<sup>23</sup> For example, R. Clarida, J. Gali, and M. Gertler, "Optimal Monetary Policy in Closed vs. Open Economies: An Integrated Approach," NBER Working Paper No. 8604, November 2001; and "The Empirics of Monetary Policy Rules in Open Economies," NBER Working Paper No. 8603, November 2001.

<sup>24</sup> David Laxton and Paolo Pesenti answer that central banks in emerging market countries (such as Czechoslovakia) need to move the interest rate more strongly in response to

movements in forecasted inflation than a rich country would. See "Monetary Rules for Small, Open, Emerging Economies," NBER Working Paper No. 9568, March 2003. In A. Fraga, I. Goldfajn, and A. Minella, "Inflation Targeting in Emerging Market Economies," NBER Working Paper No. 10019, October 2003, the authors consider what emerging market central banks can do in light of lower credibility and larger external shocks than are faced by their counterparts in rich countries.

<sup>25</sup> B. Eichengreen and D. Leblang, "Capital Account Liberalization and Growth: Was Mr. Mahatir Right?" NBER Working Paper No. 9427, January 2003.

<sup>26</sup> A. Chari and P. B. Henry, "Capital Account Liberalization: Allocative Efficiency or Animal Spirits," NBER Working Paper No. 8908, April 2002; "Risk Sharing and Asset Prices: Evidence from a Natural Experiment," NBER Working Paper No. 8988, June 2002; and "Capital Account Liberalization, the Cost of Capital, and Economic Growth," NBER Working Paper No. 9488, February 2003. In P. Gourinchas and O. Jeanne, "The Elusive Gains from International Financial Integration," NBER Working Paper No. 9684, May 2003, the authors estimate the gains from financial integration at about 1 percent, which they consider small.

<sup>27</sup> Kristin Forbes finds that Chile's famous controls on capital inflows raised the cost of capital for small firms in particular. See "One Cost of the Chilean Capital Controls: Increased Financial Constraints for Smaller Firms," NBER Working Paper No. 9777, June 2003. For Carmen Reinhart and Todd Smith, the main problem is being able to remove the controls at the right time. See "Temporary Controls on Capital Inflows," NBER Working Paper No. 8422, August 2001. On the other hand, Ross Levine and Sergio L. Schmukler, looking at 55 countries, find that when some firms are able to raise equity capital abroad, the remaining firms lose liquidity. See "Migration, Spillovers and Diversion: Impact of Internationalization on Stock Market Liquidity," NBER Working Paper No. 9614, April 2003.

<sup>28</sup> D. Rodrik and E. Kaplan, "Did the Malaysian Capital Controls Work?" NBER Working Paper No. 8142, February 2001.

<sup>29</sup> S. Johnson and T. Mitton, "Cronyism and Capital Controls: Evidence from Malaysia," NBER Working Paper No. 8521, October 2001.

<sup>30</sup> J. De Gregorio, S. Edwards, and R. G. Valdes, "Controls on Capital Inflows: Do They Work?" NBER Working Paper No. 7645, April 2000.

<sup>31</sup> J. G. Biscarri, S. Edwards, and F. Perez de Gracia, "Stock Market Cycles, Liberalization, and Volatility," NBER Working Paper No. 9817, July 2003.

<sup>32</sup> M. Klein and G. Olivei, "Capital Account Liberalization, Financial Development, and Economic Growth," NBER Working Paper No. 7384, October 1999; and S. Edwards, "Capital Mobility and Economic Performance: Are Emerging Economies Different?" NBER Working Paper No. 8076, January 2001.

<sup>33</sup> P. Martin and H. Rey, "Financial Globalization and Emerging Markets: With or Without Crash?" NBER Working Paper No. 9288, October 2002.

<sup>34</sup> C. Arteta, B. Eichengreen, and C. Wyplosz, "When Does Capital Account Liberalization Help More than It Hurts?" NBER Working Paper No. 8414, August 2001. They reject the claim that it is the level of development that matters.

<sup>35</sup> M. D. Chinn and H. Ito, "Capital Account Liberalization, Institutions, and Financial Development: Cross-Country Evidence," NBER Working Paper No. 8967, May 2002.

<sup>36</sup> M. Klein, "Capital Account Openness and the Variety of Growth Experience," NBER Working Paper No. 9500, February 2003.

<sup>37</sup> S. Wei and Y. Wu, "Negative Alchemy: Corruption, Composition of Capital Flows, and Currency Crises," NBER Working Paper No. 8187, March 2001, published in *Managing Currency Crises in Emerging Markets*, S. Edwards and J. Frankel, eds., Chicago: University of Chicago Press, 2002.

<sup>38</sup> G. Kaminsky and S. L. Schmukler, "Short-run Pain, Long-run Gain: The Effects of Financial Liberalization," NBER Working Paper No. 9787, June 2003. Capital controls become harder to enforce if the trade account has already been liberalized. See J. Aizenman, "On the Hidden Links Between Financial and Trade Openness," NBER Working Paper No. 9906, August 2003.

<sup>39</sup> H. Edison, M. Klein, L. Ricci, and T. Sloek, "Capital Account Liberalization and Economic Performance: Survey and Synthesis," NBER Working Paper No. 9100, August 2002.

<sup>40</sup> The phrase is from Carmen Reinhart, Kenneth Rogoff, and Miguel Savastano, in

"Debt Intolerance," NBER Working Paper No. 9908, August 2003; they attribute the problem to a country's history of default and inflation.

<sup>41</sup> For example, Roberto Rigobon finds that Mexico's susceptibility to international contagion diminished sharply, after it was upgraded by Moody's in 2000. See "The Curse of Non-Investment Grade Countries," NBER Working Paper No. 8636, December 2001.

<sup>42</sup> For example, research shows that fiscal policy continues to be pro-cyclical in Latin America. See E. Talvi and C. Vegh, "Tax Base Variability and Pro-cyclical Fiscal Policy," NBER Working Paper No. 7499, January 2000.

<sup>43</sup> A. Razin and E. Sadka, "A Brazilian-Type Debt Crisis: Simple Analytics," NBER Working Paper No. 9606, April 2003.

<sup>44</sup> V.V. Chari and P. J. Kehoe, "Financial Crises as Herds: Overturning the Critiques," NBER Working Paper No. 9658, April 2003.

<sup>45</sup> J. Ventura, "Bubbles and Capital Flows," NBER Working Paper No. 9304, November 2002.

<sup>46</sup> G. Kaminsky, R. K. Lyons, and S. L. Schmukler, "Managers, Investors, and Crises: Mutual Fund Strategies in Emerging Markets," NBER Working Paper No. 7855, August 2000.

<sup>47</sup> G. Corsetti, P. Pesenti, and N. Roubini, "The Role of Large Players in Currency Crises," NBER Working Paper No. 8303, May 2001; published in Edwards and Frankel, *op.cit.*

<sup>48</sup> B. Eichengreen and R. Hausmann, "Exchange Rates and Financial Fragility," NBER Working Paper No. 7418, November 1999; and B. Eichengreen, R. Hausmann, and U. Panizza, "Currency Mismatches, Debt Intolerance, and Original Sin: Why They Are Not the Same and Why it Matters," NBER Working Paper No. 10036, October 2003.

<sup>49</sup> M. Schneider and A. Tornell, "Balance Sheet Effects, Bailout Guarantees, and Financial Crises," NBER Working Paper No. 8060, December 2000; and L. F. Céspedes, R. Chang, and A. Velasco, "Balance Sheets and Exchange Rate Policy," NBER Working Paper No. 7840, August 2000.

<sup>50</sup> The IFM program, and the entire economics profession, suffered the tremendous loss of Rudiger Dornbusch in 2002. He had given us, among much else, such concise contributions to international finance as the phrases "overshooting," "news," and "sudden stops."

Rudi continued his characteristic hectic pace up until the end. One of his last articles summed up his wisdom on the balance sheet issues: "A Primer on Emerging Market Crises," NBER Working Paper No. 8326, June 2001, published in Edwards and Frankel, *op.cit.*

<sup>51</sup> M. Draghi, F. Gianazzi, and R. C. Merton, "Transparency, Risk Management, and International Financial Fragility," NBER Working Paper No. 9806, June 2003; R. Dekle and K. M. Kletzer, "Domestic Bank Regulation and Financial Crises: Theory and Empirical Evidence from East Asia," NBER Working Paper No. 8322, June 2001; M. D. Chinn and K. M. Kletzer "International Capital Inflows, Domestic Financial Intermediation, and Financial Crises under Imperfect Information," NBER Working Paper No. 7902, September 2000; D. Diamond and R. Rajan "Banks, Short-Term Debt, and Financial Crises: Theory, Policy Implications, and Applications," NBER Working Paper No. 7764, June 2000; C. Burnside, M. Eichenbaum, and S. Rebelo, "On the Fundamentals of Self-Fulfilling Speculative Attacks," NBER Working Paper No. 7554, February 2000; and J. Habm and F. S. Mishkin, "Causes of the Korean Financial Crisis: Lessons for Policy," NBER Working Paper No. 7483, January 2000.

<sup>52</sup> R. E. Lipsey, "Foreign Direct Investors in Three Financial Crises," NBER Working Paper No. 8084, January 2001.

<sup>53</sup> A. Razin, E. Sadka, and C. Yuen, "Why International Equity Flows to Emerging Markets are Inefficient and Small Relative to International Debt Flows," NBER Working Paper No. 8659, December 2001.

<sup>54</sup> M. Uribe and V. Yue, "Country Spreads and Emerging Countries: Who Drives Whom?" NBER Working Paper No. 10018, October 2003.

<sup>55</sup> R. Rigobon, "Identification through Heteroskedasticity: Measuring Contagion between Argentinean and Mexican Sovereign Bonds," NBER Working Paper No. 7493, January 2000; G. L. Kaminsky and C. M. Reinhart, "Financial Markets in Times of Stress," NBER Working Paper No. 8569, October 2001; K. Bae, G. A. Karolyi, and R. M. Stulz, "A New Approach to Measuring Financial Contagion" NBER Working Paper No. 7913, September 2000; K. J. Forbes and R. Rigobon, "Contagion in Latin America: Definitions, Measurement, and Policy Implications," NBER Working Paper No. 7885, September 2000.

<sup>56</sup> J. T. Donohue and K. A. Froot, "The Persistence of Emerging Market Equity Flows," NBER Working Paper No. 9241, September 2002.

<sup>57</sup> G. L. Kaminsky and C. M. Reinhart, "The Center and the Periphery: The Globalization of Financial Turmoil," NBER Working Paper No. 9479, February 2003.

<sup>58</sup> K. J. Forbes, "Are Trade Linkages Important Determinants of Country Vulnerability to Crises?" NBER Working Paper No. 8194, March 2001; K. J. Forbes and M. D. Chinn, "A Decomposition of Global Linkages in Financial Markets over Time," NBER Working Paper No. 9555, March 2003.

<sup>59</sup> For example, G. Calvo, "Explaining Sudden Stops, Growth Collapse, and BoP Crises: The Case of Distortionary Output Taxes," NBER Working Paper No. 9864, July 2003; C. Arellano and E. M. Mendoza, "Credit Frictions and 'Sudden Stops' in Small Open Economies: An Equilibrium Business Cycle Framework for Emerging Markets Crises," NBER Working Paper No. 8880, April 2002; and E. M. Mendoza, "Credit, Prices, and Crashes: Business Cycles with a Sudden Stop," NBER Working Paper No. 8338, June 2001.

<sup>60</sup> A. Labiri and C. Végh, "Delaying the Inevitable: Optimal Interest Rate Policy and Balance of Payments Crises," NBER Working Paper No. 7734, June 2000; L. J. Christiano, C. Gust, and J. Roldos, "Monetary Policy in a Financial Crisis," NBER Working Paper No. 9005, June 2002; R. A. Caballero and A. Krishnamurthy, "A 'Vertical' Analysis of Crises and Intervention: Fear of Floating and Ex Ante Problems," NBER Working Paper No. 8428, August 2001; A. Drazen, "Interest Rate Defense Against Speculative Attack as a Signal: A Primer," and B. Eichengreen and A. K. Rose, "Does it Pay to Defend against a Speculative Attack?" both published in *Managing Currency Crises in Emerging Markets*, J. Frankel and M. Dooley, eds., Chicago: University of Chicago Press, 2003.

<sup>61</sup> R. J. Barro, "Economic Growth in East Asia Before and After the Financial Crisis," NBER Working Paper No. 8330, June 2001. He estimates that the combined currency and banking crises in East Asia in 1997-8 reduced economic growth in the affected countries over a five-year period by 3 percent per year, compared to 2 percent per year

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<sup>62</sup> M. Hutchison, "A Cure Worse Than the Disease? Currency Crises and the Output Costs of IMF-Supported Stabilization Programs," NBER Working Paper No. 8305, May 2001; published in Dooley and Frankel, *op.cit.*

<sup>63</sup> J. Friedman and J. Levinsohn, "The Distributional Impacts of Indonesia's Financial Crisis on Household Welfare: A 'Rapid Response' Methodology," NBER Working Paper No. 8564, October 2001; and W. Easterly, "IMF and World Bank Structural Adjustment Programs and Poverty." Both papers were published in Dooley and Frankel, *op.cit.*

<sup>64</sup> S. Claessens, D. Klingebiel, and L. Laeven, "Financial Restructuring in Banking and Corporate Sector Crises: What Policies to Pursue?" NBER Working Paper No. 8386, July 2001; and B. M. Friedman, "Debt Restructuring," NBER Working Paper No. 7722, May 2000.

<sup>65</sup> C. Burnside, M. Eichenbaum, and S. Rebelo, "Government Finance in the Wake of a Currency Crisis," NBER Working Paper No. 9786, June 2003.

<sup>66</sup> High pass-through especially characterizes developing countries that are (unofficially) dollarized in the sense that a high percentage of assets and liabilities are denominated in dollars. See C. M. Reinhart, K. S. Rogoff, and M. A. Savastano, "Addicted to Dollars," NBER Working Paper No. 10015, October 2003.

<sup>67</sup> A. Burstein, M. Eichenbaum, and S. Rebelo, "Why Are Rates of Inflation So Low after Large Devaluations?" NBER Working Paper No. 8748, January 2002.

<sup>68</sup> P. Bacchetta and E. van Wincoop, "A Theory of the Currency Denomination of International Trade," NBER Working Paper No. 9039, July 2002.

<sup>69</sup> C. Engel, "Expenditure Switching and Exchange Rate Policy," NBER Working Paper No. 9016, June 2002, and in "The Responsiveness of Consumer Prices to Exchange Rates and Implications for Exchange Rate Policy: A Survey of a Few Recent New Open Economy Models," NBER Working Paper No. 8725, January 2002. See also M. Devereux, C. Engel, and P. E. Storgaard, "Endogenous Exchange Rate Passthrough when Nominal Prices Are Set in Advance," NBER Working Paper No. 9543, March 2003.

<sup>70</sup> M. Obstfeld, "Exchange Rates and Adjustment," NBER Working Paper No. 9118, August 2002.



<sup>71</sup> J. B. DeLong and B. Eichengreen, "Between Meltdown and Moral Hazard: The International Monetary and Financial Policies of the Clinton Administration," NBER Working Paper No. 8443, August 2001, published in J. Frankel and P. Orszag, eds., *American Economic Policy in the 1990s*, Cambridge, MA: MIT Press, 2002.

<sup>72</sup> J. A. Frankel and N. Roubini, "The Role of Industrial Country Policies in Emerging Market Crises," NBER Working Paper No. 8634, December 2001, published in *Economic and Financial Crises in Emerging Market Economies*, M. Feldstein, ed., Chicago: University of Chicago Press, 2003.

<sup>73</sup> A. O. Krueger, "IMF Stabilization Programs," and M. Goldstein, "IMF Structural Adjustment Programs;" both published in Feldstein, *op.cit.*

<sup>74</sup> M. Dooley and S. Verma, "Rescue Packages and Output Losses Following Crises," NBER Working Paper No. 8315, June 2001, published in Dooley and Frankel, *op.cit.*; and M. D. Bordo and A. J. Schwartz, "Measuring Real Economic Effects of Bailouts: Historical Perspectives on How Countries in Financial Distress Have

Fared With and Without Bailouts," NBER Working Paper No. 7701, May 2000.

<sup>75</sup> A. Shleifer, "Will the Sovereign Debt Market Survive?" NBER Working Paper No. 9493, February 2003.

<sup>76</sup> The prediction of Barry Eichengreen and Ashoka Mody, that the adoption of CACs would not discourage investors in the case of more creditworthy issuers looks good, so far. See "Would Collective Action Clauses Raise Borrowing Costs?" NBER Working Paper No. 7458, January 2000. Also B. Eichengreen and C. Ruehl, "The Bail-In Problem: Systematic Goals, Ad Hoc Means," NBER Working Paper No. 7653, April 2000.

<sup>77</sup> P. Agenor and J. Aizenman, "Financial Sector Inefficiencies and Coordination Failures: Implications for Crisis Management," NBER Working Paper No. 7446, December 1999.

<sup>78</sup> P. B. Henry and S. Arslanalp, in "Debt Relief: What Do the Markets Think?" NBER Working Paper No. 9369, December 2002, conclude there is no evidence that debt forgiveness for highly indebted poor countries will work today as under the Brady Plan. See also S. Edwards, "Debt Relief and Fiscal Sustainability," NBER Working

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<sup>79</sup> Whether deliberately or unavoidably — see A. Neut and A. Velasco, "Tough Policies, Incredible Policies?" NBER Working Paper No. 9932, August 2003.

<sup>80</sup> A. K. Rose, "One Reason Countries Pay Their Debts: Renegotiation and International Trade," NBER Working Paper No. 8853, March 2002. See also, A. K. Rose and M. Spiegel, "A Gravity Model of Sovereign Lending: Trade, Default, and Credit," NBER Working Paper No. 9285, October 2002. Perhaps this is why countries with low trade/GDP ratios like Argentina tend to get into trouble with their creditors more often than open countries. See G. Calvo, A. Izquierdo, and E. Talvi, "Sudden Stops, The Real Exchange Rate, and Fiscal Sustainability: Argentina's Lessons," NBER Working Paper No. 9828, July 2003.

<sup>81</sup> M. P. Dooley, "Can Output Losses Following International Financial Crises be Avoided?" NBER Working Paper No. 7531, February 2000.

<sup>82</sup> M. Kremer and S. Jayachandran, "Odious Debt," NBER Working Paper No. 8953, May 2002.

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# Taxpayer Behavior and Government Policy

Alan J. Auerbach\*

Taxpayers respond to government policies. These responses, in turn, can inform government policy design. The increasing fluidity of capital markets calls new attention to the impact and formulation of capital income taxation, in particular to the possible economic benefits of fundamental income tax reforms that would reduce the burdens and distortions imposed on capital income. Much of my recent research has focused on the interrelated topics of measuring agents' responses to capital income taxation, evaluating alternative tax systems, and considering how governments can and do respond to taxpayer behavior.

## Households, Firms and Capital Income Taxes

Capital gains taxes are often cited in relation to potentially large taxpayer responses. Because capital gains taxes are normally due only upon the voluntary sale of assets and can be avoided entirely when appreciated assets are held until a taxpayer's death, there is scope for considerable tax planning, including general avoidance of capital gains taxes and the timing of realized gains to coincide with temporary dips in tax rates. Indeed, the billions of dollars of capital gains realized annually present something of a puzzle, in light of theories suggesting that optimizing taxpayers should be able to avoid realizing net gains and take advantage of their ability to use a limited annual

amount of capital losses to shelter other taxable income.

In a joint paper with Leonard E. Burman and Jonathan M. Siegel<sup>1</sup>, I considered the capital gains realization behavior of taxpayers over the ten-year period 1985-94, focusing on the extent to which individuals engaged in tax avoidance techniques, notably the realization of capital losses to shield realized capital gains and other income. Our investigation was facilitated by the richness of our data set, which was highly stratified by income and provided information on all capital asset transactions. The results indicated that only about one-tenth of taxpayers exhibited net capital losses in a typical year, a finding consistent with an earlier one by James M. Poterba.<sup>2</sup> We also found, however, that the likelihood of having net capital losses in a given year, and the likelihood of *persistence* in this state from one year to the next, were both strongly related to wealth and to a constructed measure of taxpayer "sophistication," defined by evidence that the taxpayer engaged in short sales or traded in derivatives at least once during the sample period. These findings are consistent with tax avoidance activity being costly and more accessible to those with greater wealth and information.

If investors differ in their access to avoidance technology, then we would also expect them to differ in their responses to changes in tax rates. Using the same data set, Siegel and I estimated models of capital gains realization behavior, distinguishing responses to permanent and transitory tax rates changes.<sup>3</sup> Our basic results were consistent with those in earlier studies<sup>4</sup>, estimating substantially larger behavioral elasticities to transitory changes than to permanent ones. But

we also found strong differences from these basic results when looking exclusively at the taxpayers that our earlier paper had found to be more likely to engage in tax avoidance activity — the rich and "sophisticated." For these two groups, responses to permanent tax rates changes were even smaller, and responses to transitory tax rate fluctuations even larger — findings consistent with this group using timing as yet another tax avoidance mechanism and, as a result, facing a lower overall burden of taxation and hence being less sensitive to permanent tax rates changes.

Just as challenging to understand as the determinants of capital gains realization and avoidance behavior is the impact of dividend taxation on corporate financial and investment decisions. Through the years, the payment of dividends in the face of a sizable tax penalty has generated considerable theorizing, with implications regarding the extent to which dividend taxes distort behavior rather than simply being capitalized into the values of corporate shares. One important prediction of the "new view" that emphasizes capitalization is that firms rely heavily on retained earnings as the marginal source of equity finance.<sup>5</sup> Testing this theory directly using a panel of U.S. nonfinancial corporations, Kevin A. Hassett and I<sup>6</sup> found significant heterogeneity, with two distinctly different types of firms likely to rely much more heavily than others on retained earnings. Firms in one group have relatively weak capital market access and so must rely on internal funds, while a second group of much larger firms have stronger access to capital markets but appear to rely more heavily on fluctuations in borrowing to complement the use of internal funds. By

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implication, dividend taxes are likely to have a much weaker impact on marginal investment decisions by these two groups of firms than is implied by theories that ignore the use of retained earnings as a marginal source of funds. This is because reductions in dividend taxes also raise the cost of retaining earnings for these firms.

## Tax System Design

For many years, economists have discussed and debated the potential benefits of a shift from income taxation to consumption taxation. While much of the discussion has related to the effects on capital accumulation (see the discussion below), another possible benefit of consumption taxation lies in its obviating the need to measure capital income. This attribute has assumed greater prominence as financial innovation has given us tax instruments that make it ever harder to identify not only the magnitude of capital income, but also when it occurs, where it is earned, and to whom it should be attributed. But, drawing on our own earlier related papers on capital gains taxation<sup>7</sup>, David F. Bradford and I<sup>8</sup> showed that the key element of consumption taxation that effectuates this simple treatment of capital income is the taxation of cash flows, not the elimination of a tax burden on capital income. By relying on cash-flow taxation, we showed, it is possible to implement a tax that imposes the same burden on capital income as a traditional income tax without the need to *measure* capital income. That is, leaving aside the question of whether it would wish to do so, the government can impose a capital income tax without measuring capital income.

Another consequence of financial innovation has been the growth of the financial services sector, prompting one to consider the appropriate treatment of financial services under a consumption tax, notably the value added tax (VAT). Some approaches exempt financial activities entirely, while others would apply special rules to financial companies. Yet, in considering the basic principles underlying consumption taxation, Roger H. Gordon and I found that these principles gen-

erally imply that financial services should be subject to the same rules under the VAT as other activities.<sup>9</sup>

## Estimating the Impact of Tax Reform

Realistic evaluation of a shift to consumption taxation requires one to consider how broad the new tax base will be, how progressive the tax system will be, and what type of transition relief will be provided to those adversely affected by the reform. Using an intertemporal overlapping-generations general equilibrium model with twelve lifetime income classes in each age cohort, David Altig, Laurence J. Kotlikoff, Kent A. Smetters, Jan Walliser, and I estimated the transition and long-run gains in welfare and output from a variety of tax reforms, starting from the current income tax.<sup>10</sup> We found that significant increases in output could accompany the shift to a consumption tax, but that most of the gains would be forgone if the new tax system maintained the original degree of progressivity and provided full transition relief to holders of existing assets.

Dynamic general equilibrium models are also useful for analyzing the effects of less sweeping changes in tax policy. Recently, I considered the impact of the 2001 reduction in U.S. federal income taxes put forward by President Bush, the Economic Growth and Tax Relief Reconciliation Act.<sup>11</sup> The task of determining the legislation's economic impact was complicated by several factors. First, the legislation included a variety of "phase-in" provisions that caused incentives to vary over time. Second, the tax cut was scheduled to "sunset" after ten years, but taxpayers might reasonably have discounted the likelihood that the sunset would occur. Finally, the tax cut was substantial, leaving taxpayers to infer what further fiscal actions would occur to compensate for the reduction in revenues. My results suggested that the Bush tax cut should have increased labor supply, output, and saving in the short run. These effects would likely be reversed in the long run, though, because of accumulating deficits. But the magnitudes of both short-run and long-run responses depend on unob-

served taxpayer expectations about government policy responses, such as how long the tax cut will last and the extent to which the larger deficits will lead to higher taxes or lower government spending. In other recent work, I have estimated these responses<sup>12</sup>, finding that legislated changes in both revenues and spending react significantly to near-term estimates of the federal budget surplus, with these relationships present in both Democratic and Republican administrations over the past two decades.

An interesting by-product of this general equilibrium analysis of the 2001 Bush tax cut is that it provides a measure of the tax cut's "dynamic scoring"—the estimated feedback effects of taxpayer behavior on revenue. By comparing the revenue losses generated by the model with those that would occur without any behavioral response, one can estimate how much of the static revenue loss would be recouped by expanded economic activity.<sup>13</sup> The simulations suggest that dynamic scoring has a sizable impact on estimated short-run revenue losses, even though the tax cut's impact on output and national saving is still negative in the long run. As with the macroeconomic effects of the policy, estimates of dynamic revenue responses depend on assumptions about future government policy reactions highlighting one of the challenges to the further implementation of dynamic scoring.

<sup>1</sup> A. J. Auerbach, L. E. Burman, and J. M. Siegel, "Capital Gains Taxation and Tax Avoidance: New Evidence from Panel Data," NBER Working Paper No. 6399, February 1998, and in *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*, J. B. Slemrod, ed., Cambridge, MA: Harvard University Press, 2000.

<sup>2</sup> J. M. Poterba, "How Burdensome are Capital Gains Taxes?" *Journal of Public Economics*, 33 (July 1987) pp.157-72.

<sup>3</sup> A. J. Auerbach and J. M. Siegel, "Capital-Gains Realizations of the Rich and Sophisticated," NBER Working Paper No. 7532, February 2000, and in *American Economic Review*, 90 (May 2000), pp. 276-82.

<sup>4</sup> See L. E. Burman and W. C. Randolph, "Measuring Permanent Responses to

*Capital-Gains Tax Changes in Panel Data,* American Economic Review, 84 (September 1994), pp. 794-809.

<sup>5</sup> A. J. Auerbach, "Taxation and Corporate Financial Policy," NBER Working Paper No. 8203, April 2001, and in Handbook of Public Economics, 3, A. J. Auerbach and M. Feldstein, eds., Amsterdam: Elsevier/North-Holland, 2003.

<sup>6</sup> A. J. Auerbach and K. A. Hassett, "On the Marginal Source of Investment Funds," NBER Working Paper No. 7821, August 2000, and in Journal of Public Economics, 87 (January 2003), pp. 205-32.

<sup>7</sup> A. J. Auerbach, "Retrospective Capital Gains Taxation," NBER Working Paper No. 2792, December 1988, and in American Economic Review, 81 (March 1991), pp. 167-78; D. F. Bradford, "Fixing Capital Gains: Symmetry, Consistency and Correctness in the Taxation

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<sup>8</sup> A. J. Auerbach and D. F. Bradford, "Generalized Cash-Flow Taxation," NBER Working Paper No. 8122, February 2001; forthcoming in the Journal of Public Economics.

<sup>9</sup> A. J. Auerbach and R. H. Gordon, "Taxation and Financial Services under a VAT," American Economic Review, 92 (May 2002), pp. 411-16.

<sup>10</sup> D. Altig, Alan J. Auerbach, L. J. Kotlikoff, K. A. Smetters, and J. Walliser, "Simulating U.S. Tax Reform," NBER Working Paper No. 6248, October 1997, and in American Economic Review, 91 (June 2001), pp. 574-95.

<sup>11</sup> A. J. Auerbach, "The Bush Tax Cut and National Saving," NBER Working Paper

No. 9012, June 2002, and in the National Tax Journal, 55 (September 2002), pp. 387-407.

<sup>12</sup> A. J. Auerbach, "Is There a Role for Discretionary Fiscal Policy?" NBER Working Paper No. 9306, November 2002, and in Rethinking Stabilization Policy: Proceedings of a Symposium Sponsored by the Federal Reserve Bank of Kansas City, Federal Reserve Bank of Kansas City, Kansas City, MO, 2003; A. J. Auerbach, "Fiscal Policy, Past and Present," NBER Working Paper No. 10023, October 2003, and in Brookings Papers on Economic Activity, 1 (2003), pp. 75-138.

<sup>13</sup> See A. J. Auerbach, "Dynamic Revenue Estimation," Journal of Economic Perspectives, 10 (Winter 1996), pp. 141-57.

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# Welfare Reform, Health Insurance, and Health

Robert Kaestner\*

In 1996, Congress passed and the President signed the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), or what has become known as welfare reform. To many, welfare reform has been an unqualified success; welfare rolls decreased markedly and single mothers began working in unprecedented numbers.<sup>1</sup> Moreover, poverty rates among single mothers have decreased sharply.<sup>2</sup> Welfare reform may have had some unintended consequences, though, particularly the loss of health insurance. However, contrary to some earlier studies, my research finds that welfare reform was responsible for only a small increase, less than 4 percent, in the proportion of less-educated, unmarried mothers and their children without health insurance. And, consistent with these small effects on insurance, I find that changes in the welfare caseload attributable to welfare reform were associated with few adverse health effects among less-educated, unmarried mothers. Indeed, changes in the welfare caseload were associated with some significant improvements in healthy lifestyles among this group. Decreases in the welfare caseload between January 1996 and June 2000 were associated with a 30 percent decrease in the probability of binge drinking in the past month, and a 27 percent increase in the probability of engaging in regular and sustained physical activity.

The potential loss of health insurance was an important concern of Congress during the debate leading to

passage of PRWORA. In fact, PRWORA contains provisions “assuring Medicaid coverage for low-income families,” which provides — among other things — transitional Medicaid benefits for those who leave welfare. If welfare reform led to loss of health insurance coverage, as has been claimed, it might have adversely affected the health of persons in these families. Furthermore, welfare reform could have affected women’s health in ways other than through changes in insurance coverage. Between 1994 and 2000, approximately one-fifth of all low-educated, single mothers made the transition from welfare-to-work. The switch from subsidized household work to paid employment could affect financial resources, time constraints, and the amount and kind of physical activity, all of which may affect women’s health and health behaviors. On the other hand, employment may result in improved feelings of self worth, increased earnings, and greater access to quality health care through employer-sponsored insurance, and these changes may improve women’s health.

Surprisingly, there has been relatively little study of the effect of welfare reform on health insurance coverage and health, even though health is an essential component of wellbeing and arguably is as important as material wellbeing, which has been a widely studied outcome of welfare reform. Here I report on some recent research related to these issues.

## Welfare Reform and Health Insurance

It is widely believed that an unintended consequence of welfare reform was the loss of health insurance coverage among low-income families. This belief is based on several pieces of information: studies of welfare “leavers” find that a substantial proportion of former

welfare recipients are uninsured in the year after leaving welfare;<sup>3</sup> studies of the effect of welfare reform on Medicaid enrollment find a significant decline in Medicaid enrollment among low-income women and children after the implementation of welfare reform;<sup>4</sup> and there is evidence that administrative hurdles limit enrollment in Medicaid for low-income families not receiving public assistance.<sup>5</sup>

However, none of this evidence is definitive. Consider the “leaver” studies, for example. These studies cannot differentiate between women and children who left public assistance because of welfare reform, and those who left voluntarily — that is, those who would have left public assistance even in the absence of reform. The evidence suggests that between one-tenth and one-third of the decline in welfare caseloads is a result of welfare reform.<sup>6</sup> Thus, only a portion of the families in “leaver” studies can provide information about the effect of welfare reform on health insurance status. Since the motivation for leaving welfare differs between the two groups — one was induced to leave by legislation and the other left voluntarily — the consequences of leaving also may be very different. In addition, leaver studies fail to consider the experiences of those who were diverted from welfare because of changes in policy.

To investigate the effect of welfare reform on health insurance coverage, Neeraj Kaushal and I examine the relationship between changes in the welfare caseload and state and federal welfare policy, and changes in health insurance coverage of single mothers and their children.<sup>7</sup> Estimates from our analysis suggest that the 42 percent decrease in the caseload between 1996 and 1999 was associated with the following changes in the insurance status of low-educated single mothers: a decrease in Medicaid participation of between 7

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and 9 percent; an increase in employer-sponsored insurance coverage of 6 percent; and an increase in the proportion uninsured of between 2 and 9 percent. For children of these mothers, the decline in the welfare caseload between 1996 and 1999 was associated with: a decrease in Medicaid participation of between 3 and 5 percent; an increase in private insurance coverage of between zero and 9 percent; and an increase in the proportion uninsured of between 6 and 11 percent.

We also estimate the effect of changes in the caseload attributable to state and federal welfare reform policy on the health insurance status of low-income families. These estimates suggest, albeit with some qualification, that decreases in the caseload caused by government policy had less adverse effects on health insurance coverage than did decreases in the caseload caused by other factors. So at most, welfare reform was responsible for a 3 to 4 percent increase in the proportion of low-income women and children without health insurance.

What are the implications of these findings? Mostly, the smaller adverse consequences that we find weaken the argument that safeguards in PRWORA to protect health insurance coverage of former welfare recipients were insufficient. Similarly, the results of this study weaken the arguments that cite the loss of health insurance as a consequence of welfare reform, justifying further expansion of Medicaid and the State Children's Health Insurance Program (SCHIP) to adults. The smaller effects that we find suggest that many women who were deterred from entering or who left welfare remained insured, particularly those induced to leave welfare because of government policies, either by using their transitional Medicaid benefits, or by obtaining employer-sponsored insurance.

Kaushal and I also study the effect of welfare reform on the health insurance coverage of low-income immigrant families.<sup>8</sup> The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) changed legal immigrants' access to public health insurance in two ways: directly, by denying Medicaid benefits to immi-

grants who arrived in the United States after August 1996; and indirectly, by denying or limiting immigrant participation in Temporary Aid to Needy Families (TANF), which is an important entry point into Medicaid.

For this group of low-income families, federal welfare reform is associated with an increase of between 17 and 27 percent in the proportion of low-educated, foreign-born single women who are uninsured. The larger effect of PRWORA on immigrants than natives is consistent with the "chilling" hypothesis: this suggests that the controversy surrounding the law had as much impact as the law itself, because for a majority of immigrant women, the immigrant provisions of PRWORA were not binding — they had arrived before 1996. Therefore, these women faced the same policy changes as U.S.-born women did. The study also suggests that, although policies under PRWORA were more restrictive towards new immigrants, the health insurance coverage of new immigrants relative to immigrants who arrived earlier was not differentially affected by PRWORA. This is also consistent with the "chilling" hypothesis. Finally, our analysis shows that among the post-1996 immigrants, the insurance coverage of single women living in states that provide both TANF and Medicaid benefits seems to have been as adversely affected as the insurance coverage of women living in states that provide for neither or just one of the programs. This is the most direct evidence that supports the "chilling" hypothesis.

Our analysis of immigrant children suggests that PRWORA adversely affected their health insurance coverage. We find that welfare reform is associated with a 150 percent increase in the proportion uninsured among this group. PRWORA also adversely affected the health insurance coverage of U.S.-born children living with foreign-born mothers. In contrast, welfare reform had no statistically significant effect on the health insurance of the children of U.S.-born single mothers. Again, this is an indication that PRWORA may have engendered fear among immigrants and dampened their enrollment in safety net pro-

grams, because PRWORA did not differentiate between U.S.-born children of foreign-born parents and U.S.-born children of U.S.-born parents.

## Welfare Reform and Health

I have studied the effect of welfare reform on health in two recent papers. Won Chan Lee and I examine the relationship between changes in the welfare caseload and welfare policy, and changes in prenatal care use and birth weight.<sup>9</sup> Our hypothesis is straightforward: welfare reform may have resulted in a loss of health insurance among pregnant women that could adversely affect their access to, and use of, prenatal care services, which in turn may have adversely affected infant health, as measured by birth weight. Our findings indicate that welfare reform had relatively small effects on the prenatal care use and infant health of less-educated, unmarried women. Among unmarried mothers with less than 12 years of education, the decrease in the welfare caseload during the late 1990s was associated with a 2 percent decrease in first trimester care; a 10 percent increase in last trimester care; a 1 percent decrease in the number of prenatal care visits; and virtually no change in birth weight. These estimates of the effect of the welfare caseload represent upper bound estimates of the effect of welfare reform since welfare reform was responsible for only part of the decrease in the caseload. Among unmarried women with 12 years of education, estimates indicate similarly small effects. In this case, there is little evidence that welfare reform affected prenatal care and the decrease in the caseload was associated with a 1 percent decrease in birth weight and a 6 percent increase in low birth weight. These relatively small effects are consistent with the findings from my other work that welfare reform did not significantly affect the number of low-educated, unmarried mothers without health insurance.

Elizabeth Tarlov and I study the effect of welfare reform on health behaviors and health.<sup>10</sup> We identify three pathways, which we refer to as employment stress, organizational stress, and financial stress, by which

changes in the welfare caseload and welfare reform may affect the health and health behaviors of low-educated, single mothers. In sum, not being on welfare entails significant changes in women's daily activities, working conditions, responsibilities, and financial circumstances, and these changes may affect their health and health behaviors. The results of our study reveal that changes in the caseload had little effect on self-reported measures of physical and mental health, but were significantly associated with two health behaviors: binge drinking and regular exercise. Decreases in the welfare caseload between January 1996 and June 2000 were associated with a 27 percent decrease in the probability of binge drinking in the past month among low-educated single mothers. Moreover, estimates suggest that the association between changes in the welfare caseload and binge drinking did not differ by the underlying cause of the caseload change. Changes attributable to policy had similar effects as changes attributable to other factors, such as the economy. Changes in the welfare caseload also were significantly associated with the probability of engaging in regular and sustained physical activ-

ity; decreases in the caseload were associated with a 27 percent increase in regular and sustained physical activity. In this case, there was some evidence that changes in the caseload attributable to policy had larger effects than changes in the caseload attributable to other reasons.

Overall, our results suggest that the recent declines in the caseload have led to healthier lifestyles among less-educated, single mothers. Decreases in the caseload are associated with less binge drinking and more exercise. Notably, the improvements in lifestyle associated with the decrease in the welfare caseload were not caused by higher employment. This suggests that women who left welfare experienced lifestyle improvements for reasons other than employment.

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<sup>2</sup> <http://www.census.gov/hhes/poverty/hst-pov/hstpov4.html>

<sup>3</sup> J. Guyer, *Health Care After Welfare: An Update of the Findings from State-Level Leaver Studies*, *Washington, DC:*

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<sup>4</sup> K. Kronebusch, "Medicaid for Children: Federal Mandates, Welfare Reform, and Policy Backsliding," *Health Affairs*, 20 (2001) pp. 97-111.

<sup>5</sup> M. Ellwood, "The Medicaid Eligibility Maze: Coverage Expands but Enrollment Problems Persist," in *Assessing the New Federalism*, *Occasional Paper No. 30*, (Washington, DC: *Urban Institute*, 1999).

<sup>6</sup> R. Blank, "Evaluating Welfare Reform in the United States," *Journal of Economic Literature*, 40 (4) (2002) pp. 1-43.

<sup>7</sup> R. Kaestner and N. Kaushal, "The Effect of Welfare Reform on Health Insurance Coverage of Low-income Women and Children," *forthcoming in Journal of Health Economics*, 2004.

<sup>8</sup> N. Kaushal and R. Kaestner, "Welfare Reform and Health Insurance of Immigrants," *unpublished manuscript*, *University of Illinois at Chicago*, 2003.

<sup>9</sup> R. Kaestner and W. Lee, "The Effect of Welfare Reform on Prenatal Care and Birth Weight," *NBER Working Paper 9769*, June 2003.

<sup>10</sup> R. Kaestner and E. Tarlov, "Changes in the Welfare Caseload and the Health of Low-educated Mothers," *NBER Working Paper No. 10034*, October 2003.

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# The Economics of Education

Steven D. Levitt\*

In recent years, I have written a number of papers related to the economics of education. This research agenda has three distinct strands. One set of papers analyzes the impact of school choice on student outcomes. A second line of research investigates teacher and administrator cheating on standardized tests, and explores how such behavior responds to the introduction of high-stakes testing. Third, I have examined Black-White test score differentials and the role that the educational system may play in contributing to those differences. I discuss these three sets of papers in turn.

## The Impact of Public School Choice on Student Outcomes

In recent years, school choice has become an increasingly prominent feature of primary and secondary school education. With the passage of new federal legislation (No Child Left Behind), there is little doubt that the trend will continue. School choice comes in a variety of flavors. Vouchers and charter schools are two types of school choice which have received a great deal of both academic and media attention. A third type of school choice, open enrollment, is actually far more prevalent than either vouchers or charter schools. Under open enrollment, students within a public school district are able to attend schools other than their neighborhood school, including specially designated magnet schools. As of 1996, open enrollment was available in more than

one in every seven school districts nationally, and in more than a third of large districts. Moreover, No Child Left Behind mandates that students in underperforming schools be provided the option to attend other schools in the district.

Along with co-authors Julie B. Cullen and Brian Jacob, I have written two papers that analyze the impact of open enrollment policies on student outcomes in the Chicago Public Schools (ChiPS). ChiPS represents an excellent laboratory for studying the impact of open enrollment. Chicago has been among the most aggressive cities in implementing this form of school choice, with more than half of the students in the system presently opting out of their neighborhood schools. Thus it may provide a window into what the future holds for other districts that are moving in the same direction. The Chicago data are also exceptionally rich, including not only detailed administrative records on attainment and test scores, but also attitudinal surveys administered periodically to students.

The first of these papers<sup>1</sup> starts with the observation that students who opt out of their local school to take advantage of open enrollment are 7.6 percentage points more likely to graduate from high school than peers who are observationally equivalent in eighth grade — off of a baseline graduation rate of 50 percent. This increment to graduation is the same order of magnitude as the gap between students at Catholic and non-Catholic schools in previous studies.

There are several competing explanations for why students who opt out of their assigned school outperform those who stay behind. Higher graduation rates among those who opt out may be the result of these students attending better schools or finding a school that better matches their prefer-

ences. In either of these cases, the increased graduation rates represent the true benefits of open enrollment. There are, however, scenarios in which the students who take advantage of school choice outperform students who do not, but the differences in outcomes do not actually reflect real benefits of open enrollment. Higher graduation rates among those who opt out may be spurious if those who opt out are better on unobserved dimensions (for example, student motivation, parental involvement). In other words, the students who opt out may have systematically done better than other students, even if they had not left their assigned schools. Also, it is possible that the graduation gap is attributable not to the students who opt out doing *better*, but rather to the students who remain behind doing *worse*, since they have less able and motivated peers.

Our results suggest that, with the exception of career academies (that is, vocational schools that focus on practical skills), the benefits of school choice to students who opt out are illusory. There are three primary pieces of evidence supporting this claim. First, in a survey administered in eighth grade that asks students a wide range of questions about their expectations for the future, past educational record, and parental involvement, the responses are strongly correlated with both the likelihood of graduation and with the decision to opt out. This suggests that students who opt out would be expected to do better, even if they had to remain in their local school. The second piece of evidence is that students who live in areas with many nearby schools on average should derive the greatest benefit from the availability of school choice, because distance to nearby schools is a strong predictor of the likelihood that a student will opt out of the assigned school. Empirically, we find that easy access to a career acad-

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my is associated with substantial increases in graduation likelihood, but the same is not true for other types of schools, including high-achieving schools. Finally, when we compare student outcomes *within* a given school (in most schools in ChiPS some students are assigned and some opt in), we find that those opting in do the same as those assigned at career academies, but do much better at other schools. Since all students at a school experience similar peers and teacher quality, the fact that those opting in far outperform those assigned to the school reinforces the idea that those who opt in are systematically better than observationally similar students who make other schooling choices and would outperform them regardless, except at career academies.

Our second paper on this topic<sup>2</sup> exploits the fact that school choice causes desirable schools in ChiPS to be oversubscribed, and many of these schools use randomized lotteries to determine which students gain admission. We analyze data from 194 separate lotteries held to gain access to high school. One drawback of the data is that we only observe student outcomes if they enroll in ChiPS. To the extent that there is selective attrition, the inferences drawn from a simple comparison of outcomes of lottery winners and losers will be misleading. Relative to past studies (for example, the Milwaukee voucher experiment), however, attrition rates are low, with over 90 percent of the students remaining in ChiPS.

Empirically, we find that those students who win the lotteries attend what appear to be substantially better high schools — for example, schools with higher achievement levels and graduation rates and lower levels of poverty. Nonetheless, consistent with our first paper discussed earlier, we find little evidence that attending these sought-after programs provides any benefit on a wide variety of traditional achievement measures, including standardized test scores, attendance rates, course-taking patterns, credit accumulation, or grades. We do, however, find evidence that attendance at such schools may improve non-traditional outcome measures, such as self-report-

ed enjoyment of school, availability of computers, expectations for college attendance, and arrest rates. This suggests that schools may be influencing children in a variety of ways not generally captured by test scores. To the extent that these non-traditional measures help to predict life outcomes such as college attendance, labor market attachment, wages, and criminal involvement, an exclusive focus on test scores will be misleading.

An important caveat to interpreting the results of both of these papers is that we are only able to evaluate how access to a particular school affects educational outcomes for a student, holding constant the existence of a school choice program. We cannot estimate the overall impact of introducing a system of school choice, which might induce changes in residential location choice or in overall school quality due to increased competition.

## Teacher Cheating

High-stakes testing, like school choice, has become an increasingly prominent feature of the educational landscape. Every state in the country, except Iowa, currently administers state-wide assessment tests to students in elementary and secondary school. Federal legislation requires states to test students annually in third through eighth grade and to judge the performance of schools based on student achievement scores.

The debate over high-stakes testing traditionally has pitted proponents arguing that such tests increase incentives for learning and hold schools accountable for their students' performance against opponents who argue that the emphasis on testing will lead teachers to substitute away from teaching other skills or topics not directly tested on the exam. Along with Brian Jacob, I have written two papers that explore a very different concern regarding high-stakes testing — cheating on the part of teachers and administrators. As incentives for high test scores increase, unscrupulous teachers may be more likely to engage in a range of illicit activities, such as changing student responses on answer sheets, or filling in the blanks when a

student fails to complete a section. Our work in this area represents the first systematic attempt to identify empirically the overall prevalence of teacher cheating and to analyze the factors that predict cheating.

To address these questions, we once again turn to data from the Chicago Public Schools, for which we have the question-by-question answers given by every student in grades 3-7 taking the Iowa Test of Basic Skills (ITBS) over an eight year period. In the first paper,<sup>3</sup> we develop and test an algorithm for detecting cheating. Our approach uses two types of cheating indicators: unexpected test score fluctuations and unusual patterns of answers for students within a classroom. Teacher cheating increases the likelihood that students in a classroom will experience large, unexpected increases in test scores one year, followed by very small test score gains (or even declines) the following year. Teacher cheating, especially if done in an unsophisticated manner, is also likely to leave tell-tale signs in the form of blocks of identical answers, unusual patterns of correlations across student answers within the classroom, or unusual response patterns within a student's exam (for example, a student who answers a number of very difficult questions correctly while missing many simple questions).

Empirically, we find evidence of cheating in approximately 4 to 5 percent of the classes in our sample. For two reasons, this estimate is likely to be a lower bound on the true incidence of cheating. First, we focus only on the most egregious type of cheating, where teachers systematically alter student test forms. There are other more subtle ways in which teachers can cheat, such as providing extra time to students, that our algorithm is unlikely to detect. Second, even when test forms are altered, our approach is only partially successful in detecting illicit behavior. We then demonstrate that the prevalence of cheating responds to relatively minor changes in teacher incentives. The importance of standardized tests in the ChiPS increased substantially with a change in leadership in 1996. Schools that scored low on reading tests were placed on proba-

tion and faced the threat of reconstitution. Following the introduction of this policy, the prevalence of cheating rose sharply in classrooms with large numbers of low-achieving students. In contrast, schools with average or higher-achieving students, which were at low risk for probation, showed no increase in cheating.

Our second paper on this topic<sup>4</sup> reports on the results of an unusual policy implementation of our cheating detection tools. We were invited by ChiPS to design and implement auditing and retesting procedures implementing our methods. Using that cheating detection algorithm, we selected roughly 120 classrooms to be retested on the Spring 2002 ITBS. The classrooms retested include not only cases suspected of cheating, but also classrooms that had achieved large gains but were not suspected of cheating, as well as a randomly selected control group. As a consequence, the implementation also allowed a prospective test of the validity of the tools we developed in our first paper on the subject.

The results of the retesting provided strong support for the effectiveness of the cheating detection algorithm. Classrooms suspected of cheating experienced large declines in test scores (on average about one grade equivalent, although in some cases the fall in mean classroom test scores was over three grade equivalents) when retested under controlled conditions. In contrast, classrooms not suspected of cheating a priori maintained virtually all of their gains on the retest. As a consequence of these audits and subsequent investigations, disciplinary action was brought against a substantial number of teachers, test administrators, and principals.

## Black-White Test Score Gaps Early in Life and the Contribution of Schools

The Black-White test score gap is a robust empirical regularity. A simple comparison of mean test scores typically finds Black students scoring roughly one standard deviation below

White students on standardized tests. Even after controlling for a wide range of covariates including family structure, socioeconomic status, measures of school quality, and neighborhood characteristics, a substantial racial gap in test scores persists.

In a paper joint with Roland Fryer,<sup>5</sup> I revisit this topic with a newly collected data set, the Early Childhood Longitudinal Study Kindergarten Cohort (ECLS-K). The survey covers a sample of more than 20,000 children entering kindergarten in the fall of 1998. The original sample of students has subsequently been re-interviewed in the spring of kindergarten and first grade.

The results we obtain using these new data are informative and in some cases quite surprising. As in previous datasets, we observe substantial racial differences in test scores in the raw data: Black kindergartners score on average .64 standard deviations worse than Whites. In stark contrast to earlier studies (including those looking at kindergartners), however, after controlling for a small number of other observable characteristics (children's age, child's birth weight, a socio-economic status measure, WIC participation, mother's age at first birth, and number of children's books in the home), we essentially eliminate the Black-White test score gap in math and reading for students entering kindergarten. While there are numerous possible explanations for why our results differ so sharply from earlier research, we conclude that real gains by recent cohorts of Blacks are likely to be an important part of the explanation.

Despite the fact that we see no difference in initial test scores for observationally equivalent Black and White children when they enter kindergarten, their paths diverge once they are in school. Between the beginning of kindergarten and the end of first grade, Black students lose .20 standard deviations (approximately .10 standard deviation each year) relative to White students with similar characteristics. The leading explanation for the worse trajectory of Black students in our sample is that they attend lower quality schools. When we compare the change

in test scores over time for Blacks and Whites attending the same school, Black students lose only a third as much ground as they do relative to Whites in the overall sample. This result suggests that differences in quality across schools attended by Whites and Blacks is likely to be an important part of the story. Interestingly, along "traditional" dimensions of school quality (class size, teacher education, computer-to-student ratio, and so on), Blacks and Whites attend schools that are similar. On a wide range of "non-standard" school inputs (for example, gang problems in school, percent of students on free lunch, amount of loitering in front of school by non-students, amount of litter around the school, whether or not students need hall passes, and PTA funding), Blacks do appear to be attending much worse schools. Other explanations for the divergence in Black-White test scores, such as a greater "summer setback" for Blacks when school is not in session, or discrimination by teachers against Blacks, find no support in our data.

<sup>1</sup> J. B. Cullen, B. Jacob, and S. D. Levitt, "The Impact of School Choice on Student Outcomes: An Analysis of the Chicago Public Schools," NBER Working Paper No. 7888, September 2000, forthcoming in *Journal of Public Economics*.

<sup>2</sup> J. B. Cullen, B. Jacob, and S. D. Levitt, "The Effect of School Choice on Student Outcomes: Evidence from Randomized Lotteries," forthcoming as an NBER Working Paper.

<sup>3</sup> B. Jacob and S. D. Levitt, "Rotten Apples: An Investigation of the Prevalence and Predictors of Teacher Cheating," NBER Working Paper No. 9413, January 2003, and *Quarterly Journal of Economics*, 117 (August 2003), pp. 843-77.

<sup>4</sup> B. Jacob and S. D. Levitt, "Catching Cheating Teachers: The Results of an Unusual Experiment in Implementing Theory," NBER Working Paper No. 9414, January 2003, and *Brookings-Wharton Papers on Urban Affairs*, 2003.

<sup>5</sup> R. Fryer and S. D. Levitt, "Understanding the Black-White Test Score Gap in the First Two Years of School," NBER Working Paper No. 8975, June 2002, forthcoming in *Review of Economics and Statistics*.

# The Effect of Advertising on Tobacco and Alcohol Consumption

Henry Saffer\*

Researchers study the effects of tobacco and alcohol advertising because the consumption of these substances is known to have potentially adverse health consequences. Tobacco use results in illness in proportion to its consumption, with about one-third of tobacco consumers dying as a result of these illnesses. Alcohol is different in that about nine out of 10 adults use alcohol in limited amounts with no adverse outcomes. The other one in ten abuses alcohol, which results in a range of negative health and social outcomes including an estimated 100,000 premature deaths per year.

There have been a number of empirical studies on the effects of tobacco and alcohol advertising. The bulk of these studies indicate that advertising does not increase tobacco and alcohol consumption. However, many public health advocacy organizations do not accept these results. An examination of the methods and data commonly used in empirical studies provides an explanation for these divergent opinions. The key to understanding the empirical problems lies in the advertising response function and the type of data used to measure advertising.

The advertising response function explains the relationship between consumption and advertising. A brand-level advertising response function shows that the consumption of a specific brand increases at a decreasing rate as advertising of that brand increases. That is, the response function illustrates a diminishing marginal product of advertising.<sup>1</sup> Ultimately,

consumption is completely unresponsive to additional advertising. The assumptions of the brand-level advertising response function also can be applied to industry-level advertising. The industry level includes all brands and products produced in an industry; for example, the industry level for alcohol would include all brands and variations of beer, wine, and spirits. The industry-level advertising response function is assumed to be subject to diminishing marginal product, as in the case of the brand-level function. The industry-level response function is different from the brand-level response function, though, in that advertising-induced sales must come at the expense of sales of products from other industries. Increases in consumption come from new consumers, often youths, or from increases by existing consumers.

The industry-level response function can be defined by measuring advertising with a time-series of national data. This function also can be defined by measuring advertising with cross-sectional data from local markets. The industry-level advertising response functions provide two simple predictions: first, if advertising is measured at a high enough level, there will be little or no consumption response; second, the greater the variance in the advertising data, the greater the probability of measuring the effect of advertising in the upward sloping section of the response function.

Most prior studies of tobacco and alcohol advertising use annual or quarterly national aggregate advertising expenditures as the measure of advertising, probably because this type of data was, at one time, the least expensive available. These time-series studies generally find that advertising has no effect. The oligopolistic nature of the tobacco and alcohol industries results in competition for market share

with advertising (and other marketing) rather than with price. Indeed, price competition may set off a price war in which all firms will lose revenue. Alternatively, the “share of voice” — that is, the percent of industry-level advertising undertaken by one firm — is directly proportional to the share of market. The advertising-to-sales ratios for tobacco and alcohol companies are about 6 to 9 percent while the average American firm has an advertising-to-sales ratio closer to 3 percent. Aggregate national advertising may well be in the range of near-zero marginal product. The advertising response function predicts that studies using national aggregate data are not likely to find much effect of advertising, and the empirical work supports this prediction.

Local advertising, known as spot advertising, is a function of local cost conditions, demographics, regulations, and other local factors. As a result, local advertising varies more than aggregate national advertising. Studies using cross-sectional measures of advertising generally find that it has positive effects; this is consistent with measurement in the upward sloping portion of the response function. A few prior studies used cross-sectional advertising data measured at the individual or local level. These studies generally found that advertising had positive effects. One possible explanation for the results from the time-series studies is that the national-level data, being more aggregated, has less variance and thus leads to insignificant effects.

The one other common type of research on advertising is the study of advertising bans. The effect of a ban on the use of one or more media is substitution into the remaining non-banned media and into other marketing techniques. This does not necessarily reduce advertising expenditures. Bans can, however, lower the average prod-

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uct of a given advertising budget. Advertising and other marketing expenditures may increase to compensate for the loss of sales attributable to the downward shift of the response function. If the bans are comprehensive enough, they may reduce consumption. The empirical work finds some evidence that bans do reduce consumption.

Counteradvertising, which is designed to reduce consumption, also fits into the framework of a response function. The counteradvertising response function slopes downward and is subject to diminishing marginal product. The levels of counteradvertising that have been undertaken are small in comparison to advertising. Thus it is likely that these expenditures are in the falling portion of the counteradvertising response function. The empirical work finds evidence that counteradvertising does reduce consumption.

To summarize, the response function predicts that using time-series aggregate national advertising data probably will lead to finding little or no effect of advertising. Cross-sectional data measuring local variations in advertising are more likely to fall in the upward sloping portion of the advertising response function, and are more likely to lead to finding a positive effect of advertising. Advertising bans, if comprehensive enough, may lead to finding effects of advertising on consumption too. With these predictions in mind I have completed seven studies which use either cross-sectional advertising data, advertising ban data, or cross-sectional counteradvertising data.

My most recent study, with Dhaval Dave, examines the effect of alcohol advertising on alcohol consumption by adolescents.<sup>2</sup> We use the Monitoring the Future (MTF) the National Longitudinal Survey of Youth 1997 (NLSY97) datasets for the empirical work. These datasets are augmented with alcohol advertising data, originating at the market level, for five media. Use of both the MTF and the NLSY97 datasets improves the empirical analysis because each has unique advantages. The large sample size of the MTF makes it possible to estimate regressions with race and gender-specific subsamples. The panel

nature of the NLSY97 makes it possible to estimate individual fixed-effects models. In addition, similar specifications can be estimated with both datasets. Since the datasets are independent, the basically consistent findings increase the confidence in all the results. These results indicate that blacks consume alcohol less than whites, and this cannot be explained with the included variables as well as it is for whites. A comparison of male and female regressions shows that price and advertising effects are generally larger for females. Models that control for individual heterogeneity result in larger advertising effects, implying that the MTF results may understate the effect of alcohol advertising. The results based on the NLSY97 suggest that a ban on all local alcohol advertising, which is about one third of all advertising, might reduce adolescent monthly drinking from about 25 percent to about 21 percent. For binge drinking, the reduction might be from about 12 percent to about 7 percent.

An earlier cross-sectional paper examined the effect of alcohol advertising on motor vehicle fatalities.<sup>3</sup> The data used were quarterly aggregates for the largest Metropolitan Statistical Areas for four years. The data indicate that the effect of a ban on broadcast alcohol advertising would be a reduction of about 2000 highway fatalities per year. The data also indicate that the elimination of the tax deductibility of alcohol advertising could reduce alcohol advertising by about 15 percent, reduce motor vehicle fatalities by about 1300 deaths per year, and raise about \$300 million a year in new tax revenue.

I also have published two studies on alcohol advertising bans. The first uses a pooled time series from 17 countries for the period 1970 to 1983.<sup>4</sup> The empirical measures of alcohol abuse are alcohol consumption, liver cirrhosis mortality rates, and highway fatality rates. The results show that countries with bans on alcohol advertising generally have lower levels of alcohol abuse. In particular, the results indicate that countries with bans on spirits advertising have about 16 percent lower alcohol consumption than

countries with no bans and that countries with bans on beer and wine advertising as well have about 11 percent lower alcohol consumption than countries with bans on spirits advertising only. A second study of alcohol advertising bans, with Dhaval Dave, followed up on the first by using a simultaneous equations system that treats both alcohol consumption and alcohol advertising bans as endogenous.<sup>5</sup> This study also updated the dataset with data from 20 countries over 26 years. The primary conclusions of this study are that alcohol advertising bans decrease alcohol consumption and that alcohol consumption has a positive effect on the legislation of advertising bans. The results indicate that an increase of one ban could reduce alcohol consumption by 5 to 8 percent. Furthermore, recent exogenous decreases in alcohol consumption will decrease the probability of enactment of new bans and undermine the continuance of existing bans. Canada, Denmark, New Zealand, and Finland recently have rescinded alcohol advertising bans. Alcohol consumption in these countries may increase, or decrease at a slower rate, than would have occurred had advertising bans remained in place.

I have conducted two studies of tobacco advertising bans as well. The first, with Frank Chaloupka, uses data from 22 OECD countries over 20 years.<sup>6</sup> We estimate the models with a full set of country and year fixed effects, along with other time-varying covariates including tobacco price, income, and the unemployment rate. The effects of the ban tend to be smaller in the models that include these additional independent variables. The primary conclusion of this research is that a comprehensive set of tobacco advertising bans can reduce tobacco consumption and that a limited set of advertising bans will have little or no effect. A second study of tobacco advertising bans used data from 102 countries.<sup>7</sup> Since no consistent price or income data are available for all of these countries, the models only use advertising bans, dichotomous country, and dichotomous year indicators as independent variables. Again, the conclusion is that a com-

prehensive set of tobacco advertising bans can reduce tobacco consumption and that a limited set of advertising bans will have little or no effect.

Finally, I am involved currently in a project with Melanie Wakefield, Chaloupka, and others to examine the effect of tobacco counteradvertising on youth smoking. This study uses data from Nielsen Media Research (NMR) on the 75 largest media markets in the United States between 1998 and 2002. These data were merged with the Monitoring the Future data. The results show that among eighth, tenth, and twelfth graders in the 1998-2000 MTF, exposure to tobacco industry-sponsored or pharmaceutical company advertising for cessation aids were either unrelated to, or increased, the probability of smoking. In contrast, higher exposure to advertisements that were part of a state-sponsored tobacco control media campaign

was significantly associated with lower levels of smoking.

In conclusion, the theory of an industry advertising response function is supported by the empirical results from my own prior studies and reconciles the contrary findings from other prior studies based on aggregated time-series data. Taken together, these empirical studies suggest that time-series advertising data for alcohol and tobacco are not appropriate for measuring the effect of advertising. However, further studies using cross-sectional data are also likely to find positive effects of advertising; studies of advertising bans will find effects if they are comprehensive bans; and studies of counteradvertising are likely to find that counteradvertising reduces consumption.

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<sup>1</sup> *At low levels of advertising, increasing marginal product is also possible.*

<sup>2</sup> H. Saffer and D. Dave, "Alcohol Advertising and Alcohol Consumption by Adolescents," NBER Working Paper No. 9676, May 2003.

<sup>3</sup> H. Saffer, "Alcohol Advertising and Motor Vehicle Fatalities," Review of Economics and Statistics, 79 (3) (August 1997).

<sup>4</sup> H. Saffer, "Alcohol Advertising Bans and Alcohol Abuse: An International Perspective," Journal of Health Economics, 10 (1991).

<sup>5</sup> H. Saffer and D. Dave, "Alcohol Consumption and Alcohol Advertising Bans," Applied Economics, 34 (11) (July 2002).

<sup>6</sup> H. Saffer and F. Chaloupka, "The Effect of Tobacco Advertising Bans On Tobacco Consumption," Journal of Health Economics, (19) (2000).

<sup>7</sup> H. Saffer, "The Control of Tobacco Advertising and Promotion" in Tobacco Control Policies in Developing Countries, P. Jha and F. Chaloupka, eds., New York: Oxford University Press, 2000.

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## NBER Profile: *Richard B. Berner*

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Richard B. Berner, a Managing Director and Chief U.S. Economist at Morgan Stanley, represents the National Association for Business Economics (NABE) on the NBER's Board of Directors. He is a Past President and a Fellow of NABE, as well as a winner of their forecasting award.

Berner received his bachelor's degree from Harvard College and his Ph.D. from the University of Pennsylvania. Before joining Morgan Stanley in 1999, he was Executive Vice President and Chief Economist at Mellon Bank, and a member of Mellon's Senior Management Committee. Prior to that, he served as a Principal and Senior Economist for Morgan Stanley, as a Director and Senior Economist for

Salomon Brothers, as Economist for Morgan Guaranty Trust Company, and as Director of the Washington office of Wharton Econometrics. He also served for seven years on the research staff of the Board of Governors of the Federal Reserve System.

Berner is a member of the Economic Advisory Panel of the Federal Reserve Bank of New York and of the Advisory Committee of the Bureau of Economic Analysis. He lives in Rye, New York, with his wife Bonnie. They have two children, Matt and Laura, who are respectively a junior and a freshman at Princeton University. In his free time, he enjoys golf and aspires to a single-digit handicap.

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## NBER Profile: *Jessica P. Einhorn*

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Jessica P. Einhorn, Dean of the Paul H. Nitze School of Advanced International Studies (SAIS) at the Johns Hopkins University, is NBER's newest Director-at-Large. She holds a B.A. from Barnard College, an M.A. in international affairs from SAIS, and a Ph.D. in politics from Princeton University.

Einhorn became Dean of SAIS on June 1, 2002. Before that she spent nearly 20 years at the World Bank, as vice president and treasurer from 1992-6, and as managing director from 1996-8. After she left the World Bank, she was a consultant in the Washington Office of Clark & Weinstock, a firm specializing in strategic communication and public affairs consulting. She has also held positions at the IMF, the U.S. Treasury, the State Department, and the International Development Cooperation Agency of the United States.

Currently, she serves as a trustee for the Rockefeller Brothers Fund and as a director of the Council on Foreign Relations, the Institute for International Economics, and the Center for Global Development. She also is a member of the board of directors of Pitney Bowes Inc., and chair of the global advisory board of J.E. Robert Cos. She is a member of the executive committee of the Trilateral Commission and a former trustee of the German Marshall Fund.

Einhorn lives in Washington, D.C. with her husband, Robert Einhorn, former Assistant Secretary of State for non-proliferation and presently Senior Advisor in the International Security Program at the Center for Strategic and International Studies (CSIS). They enjoy hiking and skiing with their extended family, and often travel together for both work and recreation.



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## NBER Profile: *Robert Kaestner*

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Robert Kaestner, who has been affiliated with the NBER since 1990, is a Research Associate in the NBER's Programs on Health Economics and The Well-being of Children. He is also a professor in the Institute of Government and Public Affairs and the department of economics at the University of Illinois at Chicago (UIC).

Kaestner received his Ph.D. in economics from the City University of New York. Prior to joining the UIC faculty, he was a professor at Baruch College of the City University of

New York. His current research interests include the effect of nurse staffing levels on hospital patient outcomes and the effect of Title IX (Education Amendments of 1972) on women's health.

Kaestner lives in Chicago with his wife, Caren Rawlins, and their baby daughter, Alessandra. He is enjoying being a new father and, when he isn't working or watching the baby, he likes to go to the theater and to play basketball. He misses New York.

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## NBER Profile: *Henry Saffer*

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Henry Saffer is a Research Associate in the NBER's Program on Health Economics and a professor of economics at Kean University (Union, New Jersey). He received his Ph. D. in economics from the City University of New York.

From 1979 to 1985, Saffer was an assistant professor of economics at Rutgers University. He joined Kean University's economics department in 1985 as an associate professor and was promoted to full professor there in 1992. He is also an adjunct professor of economics at the City University of New York's Graduate Center.

Saffer's research, particularly on the relationships between alcohol and tobacco advertising, substance abuse, and traffic fatalities, has been published in a number of professional journals and has been cited widely in the press. He has also served as a consultant to the U.S. Justice Department's Tobacco Litigation Team (2001-3) and the National Institute on Alcohol Abuse and Alcoholism Advisory Council Subcommittee on College Drinking (1999-2000).

Saffer lives in New York City with his two daughters, Beth and Maddy, and enjoys summers at the beach.



## Conferences

### 2003 East Asian Seminar on Economics Focused on International Trade

The NBER's Fourteenth Annual East Asian Seminar on Economics (EASE), sponsored jointly with Hong Kong University of Science and Technology (HKU), Korea Development Institute (KDI), Tokyo Center for Economic Research (TCER), Chung-Hua Institution for Economic Research (CIER), and the Australian Productivity Commission, took place in Taipei, Taiwan on September 5-7. The organizers were NBER Research Associates Takatoshi Ito, of Tokyo University, and Andrew K. Rose, of University of California, Berkeley. The following papers were discussed:

**Kyoji Fukao**, Hitotsubashi University, and **Keiko Ito**, ICSEAD, "Vertical Intra-Industry Trade and the Division of Labor in East Asia" Discussants: Chin Hee Hahn, KDI, and Ho-Mou Wu, National Taiwan University

**Carolyn L. Evans**, Federal Reserve Board, and **James Harrigan**, Federal Reserve Bank of New York, "Tight Clothing: How the MFA Affects Asian Apparel Exports" Discussants: Leonard Cheng, HKU, and Philippa Dee, Australian Productivity Commission

**Mitsuyo Ando** and **Fukunari Kimura**, Keio University, "Unprecedented Formation of International Production/Distribution Networks

in East Asia" Discussants: Hong Hwang, National Taiwan University, and Somkiat Tangkitvanich, Thailand Development Research Institute

**Chin Hee Hahn**, "Exporting and Performance of Plants: Evidence on Korea" Discussants: Kyoji Fukao and James Harrigan

**Shin-Horng Chen** and **Meng-Chun Liu**, CIE, "International R and D Deployment and Developing Countries' Locational Advantage: A Case Study of Taiwan" Discussants: Thomas J. Prusa, NBER and Rutgers University, and Somkiat Tangkitvanich

**Philippa Dee** and **Jyothi Gali**, Australian Productivity Commission, "The Trade and Investment Effects of Preferential Trading Arrangements" Discussants: Bih-Jane Liu, National Taiwan University, and Erlinda Medalla, Philippine Institute for Development Studies

**Kozo Kiyota**, Yokohama National University, and **Shujiro Urata**, Waseda University, "The Impacts of Free Trade Agreements on Foreign Trade in East Asia" Discussants: Dukgeun Ahn, KDI, and Erlinda Medalla

**Deng-Shing Huang**, Academia Sinica, "Trading Blocs in East Asia: Empirical Evidence from Gravity Models" Discussants: Keiko Ito and Andrew Rose

**Leonard K. H. Cheng** and **Zihui Ma**, HKU, "The Effects of Financial Crises on International Trade" Discussants: Chin Hee Hahn and Kozo Kiyota

**Edgar Cudmore** and **John Whalley**, NBER and University of Western Ontario, "Border Delays and Trade Liberalization" (NBER Working Paper No. 9485) Discussants: Francis Lui, HKU, and Chong-Hyun Nam, Korea University

**Tain-Jy Chen** and **Ying-Hua Ku**, CIER, "The Effect of FDI on Domestic Employment" Discussants: Keiko Ito and Francis Lui

**Thomas J. Prusa**, "The Growing Problem of Antidumping Protection and What It Means for the Asia-Pacific Region" Discussants: Takatoshi Ito and Chong-Hyun Nam

**Dukgeun Ahn**, "WTO Dispute Settlements in East Asia" Discussants: Da-Nien Liu, CIER, and John Whalley

Ito and Fukao investigate the deepening international division between labor and factor intensities in Japan, focusing mainly on the manufacturing sector. First they analyze the factor contents of trade; they find that

Japan's factor content of net-exports of capital and non-production labor grew rapidly, while its net-exports of production workers fell by a large amount. Interestingly, the decline in the factor content of net-exports of production

workers was almost entirely caused by Japan's trade with China and Hong Kong. However, most of the macroeconomic change in the capital-labor ratio and the skilled-labor ratio are attributable to a "within-industry"



shift, rather than a “between-industry” shift. The empirical analysis provides only weak evidence that the deepening international division of labor contributes to the change in factor intensities in each industry. These results suggest that specialization in the export of skilled-labor-intensive products may have contributed to the increase in the relative demand for skilled (professional, technical, managerial, and administrative) labor within industry. However, at the same time, these results imply that changes in trade patterns (specialization in capital-intensive production) did not offset the excess supply of capital in Japan. That is, Japan is not specializing adequately in the export of capital-intensive goods, despite the fact that the price of capital is low and capital is abundant.

International trade in apparel and textiles is regulated by a system of bilateral tariffs and quotas known as the Multifiber Arrangement or MFA. Despite a long-standing interest in the effects of the MFA, **Evans** and **Harrigan** are the first researchers to assemble a time series of detailed product-level data from the United States on the quotas and tariffs that comprise the MFA. They analyze how the MFA affects the sources and prices of U.S. apparel imports, with a particular focus on the effects on East Asian exporters during the 1990s. They show that, while a large fraction of U.S. apparel is imported under binding quotas, there are many quotas that remain unfilled. They also show that binding quotas raise import prices substantially, suggesting both quality upgrading and rent capture by exporters. In contrast, tariffs reduce import prices. Finally, the authors argue that the substantial shift of U.S. apparel imports away from Asia in favor of Mexico and the Caribbean during the 1990s is due only partly to discriminatory trade policy: the other reason is an increasing demand for timely delivery that gives a competitive advantage to nearby exporters.

**Ando** and **Kimura** claim that the international production/distribution networks in East Asia are “unique,” at least at this moment in time, in their significance in the regional economy, their geographical extensiveness involving a large number of countries in the

region, and their sophistication of both intra-firm and arm’s-length relationships across different nationalities. The authors begin by reviewing crucial changes in the policy framework in the developing East Asian countries a decade ago, and then sketching the theory behind the mechanics of international production/distribution networks. In the empirical part of the paper, the authors analyze overall trade patterns of the major East Asian countries in order to confirm the importance of international trade to machinery parts and components. Then they examine the micro data on Japanese corporate firms to look closely at the nature of networks through the pattern of FDI. The authors also quantify the magnitude of economic activities of Japanese firms through different channels of transactions, using the firm nationality approach.

Using the annual plant-level panel data on Korean manufacturing during 1990 to 1998, **Hahn** examines the relationship between exporting and various performance measures, including total factor productivity. In particular, he asks whether exporting improves productivity (learning) and whether more productive plants export (self-selection). The evidence supports both self-selection and learning-by-exporting effects, although the latter seems only short-lived. Both effects have a role in explaining positive cross-sectional correlations between exporting and TFP. Similar effects are observed when shipments or employment is considered as the performance measure. These results are broadly in line with previous studies on other countries, but contrast sharply with **Aw, Chung, and Roberts (2000)** who do not find any strong evidence of self-selection or learning in Korea. **Hahn** suggests that the benefits from exporting have been realized not only through resource reallocation channel but also via the TFP channel.

**Liu** and **Chen** examine the R and D internationalization of a newly industrializing country — Taiwan being a prime example — with a special focus on the factors underlying locational advantage for attracting multinationals’ offshore R and D. They begin with an examination of the liter-

ature on R and D internationalization and globalization, emphasizing the significance of “first-tier supplier advantage” in the Taiwanese context. The authors take advantage of an official database to reveal the patterns of foreign corporate R and D in Taiwan and to examine the determinants of foreign affiliates’ R and D intensities at the industrial level. The empirical results show that foreign affiliates in Taiwan with a higher R and D-intensity tend to be more export-oriented, localized in Taiwan in terms of sourcing of materials and capital goods, and to belong to sectors with a larger pool of the R and D labor force.

**Dee** and **Gali** quantify the impact of traditional and “new age” provisions of preferential trading arrangements (PTAs) on merchandise trade and investment. They estimate gravity models of bilateral trade and investment and find that recent and some past PTAs are not as benign as some contemporary empirical assessments have suggested. A careful consideration of the analytical issues — including controlling comprehensively for other observable and unobservable factors, and testing explicitly for whether the trade and investment effects are significantly different after PTA formation than before — accounts for the less favorable findings in this study. It is also possible for PTAs to have adverse effects on investment flows. If investment responds in “beachhead” fashion to the trade provision of PTAs, then the trade carried out from those beachheads could constitute traditional trade diversion. The investment provisions of PTAs also could create investment diversion. However, **Dee** and **Gali** find little evidence of beachhead investment, but rather of net investment creation in response to the “new age,” non-trade provisions of PTAs. Thus, the finding on investment is more positive than for trade, but not without qualifications.

**Urata** and **Kiyota** examine the impact of East Asia Free Trade Area (FTA) on trade patterns in East Asia. They use a multi-sector computable general equilibrium model and a database developed by **Hurtle (1997)** and his colleagues at Purdue University. There are four major findings in this

paper. First, the impacts of FTA on GDP and the welfare of member countries are generally positive. Second, and surprisingly, an East Asia FTA does not seem to affect the patterns of comparative advantage or intra-industry trade very much. Third, one would expect that output would decline for the protected sectors as a result of FTA, but that expectation is not really found. Finally, an East Asia FTA will promote regionalization in East Asia, but it will not necessarily promote regionalization in an Asian Free Trade Area.

**Huang** applies a gravity model in order to find empirical evidence on trading blocs in East Asia for the era following 1980. Special attention is paid to the role of openness on the part of mainland China in shaping East Asia's trade pattern. There is significant evidence of a trading bloc within a Chinese circle, including Taiwan, Hong Kong, and mainland China. Although the trade flows between Taiwan and mainland China were severely suppressed before 1987, the Chinese circle as a whole is highly integrated in terms of trade, indicating the important role that Hong Kong plays as a trading agent in the Chinese circle. The empirical results from after 1990 show that mainland China's openness in trade is empirically supported. On the other hand, East Asia as a whole is fostering a trading bloc, in the empirical sense.

**Ma** and **Cheng** study the effects of financial crises on international trade, both theoretically and empirically. Their major findings are that banking crises had a negative impact on imports but a positive impact on exports in the short term, whereas currency crises decreased both imports and exports in the short term but increased exports in the long term.

Delays at the border for customs clearance are seemingly a central feature of the trade regime in the CIS states. **Cudmore** and **Whalley** argue that, with queuing costs being determined endogenously in such circumstances, tariff liberalization (even in the small economy case) can worsen welfare, since tariff revenues are replaced by resource-using queuing costs. On the other hand, corruption can

improve welfare if queuing costs are replaced by resource-transferring bribes. The authors also show how added distortions between perishable and non-perishable, or between light and heavy, goods also can arise. They show these outcomes using a simple general equilibrium model, and explore the numerical implications using Russian data. The orders of magnitude are both significant and opposite in sign to conventional analyses.

**Chen** and **Ku** study the effects of FDI on domestic employment by examining data on Taiwan's manufacturing industry. Treating domestic versus overseas production as two distinctive outputs from a joint production function, they first estimate the effect of overseas production on the demand for domestic labor. They find that overseas production generally reduces the demand for domestic labor as overseas products substitute for primary inputs in domestic production (substitution effect). But overseas production also allows the investor to expand domestic output through enhanced competitiveness. The expanded domestic output leads to more employment at home (output effect). The net effect of FDI on domestic employment is a combination of substitution and output effects. For Taiwan, the net effect is positive in most cases but it differs across groups. Technical workers tend to benefit most from FDI, followed by managerial workers, and blue-collar workers benefit the least; indeed they may even be adversely affected. This suggests that after FDI, a reconfiguration of the division of labor within a firm tends to shift domestic production toward technology and management-intensive operations.

**Prusa** examines trends in antidumping (AD) use with particular focus on the Asia-Pacific region, the traditional source for much of the rhetoric justifying AD actions. He shows that AD is the world's biggest trade impediment primarily because of its use by countries that previously did not use AD ("new" users). Twenty years ago, the top four users accounted for 98 percent of AD actions; nowadays these traditional AD users account for only about 40 percent of the disputes.

After controlling for size, it becomes apparent that new users are filing at prodigious rates, five, ten, and even twenty times the rate of the traditional users. The proliferation has not affected the propensity for Asia-Pacific countries to be targeted by AD actions. Over the past decade, Asia-Pacific countries are subject to over 40 percent of both new and traditional user AD actions. Interestingly, there are differences in the industry composition of trade complaints between new and traditional users. Traditional and new users both tend to target industries where they are losing comparative advantage. Since this pattern varies across countries, though, AD complaints differ across source countries. In other words, the pattern of AD use says as much about the filing country as it does about the target countries.

East Asian countries have become much more active in using the WTO dispute settlement system to assert their legal rights. The dispute settlement experience for these countries so far has shown a strong tendency of domestic governments to defend the economic interest of major industries. Their primary counterparts for trade disputes are still the major developed countries, including the United States and the European Communities. In some sense Thailand is peculiar in that it brought disproportionately many complaints to the WTO dispute settlement system while it was hardly challenged by other Members. In contrast to the GATT era, Korea has become legally very aggressive under the WTO system. **Ahn** also notes that Japan rarely has been challenged since October 1998. Except for China, most East Asian countries lack the national procedure to link private economic interests to the WTO dispute settlement procedures. The next question for these Members may be how to establish a domestic system to properly represent their private economic interests in a more balanced manner and to make the WTO dispute settlement system a benign instrument for the entire economy, not a captive tool of a particular segment of industries.

## Tax Policy and the Economy

The NBER's Eighteenth Annual Conference on Tax Policy and the Economy, organized by James M. Poterba of NBER and MIT, took place in Washington, DC on November 4. These papers were discussed:

**Susan Dynarski**, NBER and Harvard University, "Tax Policy and Education Policy: Collision or Coordination? A Case Study of the 529 and Coverdell Saving Incentives"

**Mark E. Doms**, Federal Reserve Bank of San Francisco; and **Wendy E. Dunn**, **Stephen D. Oliner**, and **Daniel E. Sichel**, Federal Reserve Board, "How Fast Do Personal Computers Depreciate? Concepts and New Estimates"

**Joseph Gyourko**, University of Pennsylvania, and **Todd Sinai**, NBER and University of Pennsylvania, "The (Un)Changing Geographical Distribution of Housing Tax Benefits: 1980 to 2000"

**Emmanuel Saez**, NBER and University of California, Berkeley, "Reported Incomes and Marginal Tax Rates, 1960-2000: Evidence and Policy Implications"

**Mihir A. Desai**, NBER and Harvard University, and **William M. Gentry**, NBER and Williams College, "The Character and Determinants of Corporate Capital Gains"

Coverdell Educational Savings Accounts and 529 saving plans are marketed as attractive vehicles for college savings. But **Dynarski** finds that college savings plans can actually *harm* some families. The joint treatment of college savings by the income tax code and the financial aid system creates tax rates that exceed 100 percent for those families on the margin of receiving additional financial aid. Since even families with incomes above \$100,000 receive need-based aid, the impact of these very high taxes is quite broad. **Dynarski** finds that an aid-marginal family with funds in a Coverdell is worse off than if it did not save at all. Simulations show that \$1,000 of pre-tax income placed in a Coverdell for a newborn and left to accumulate until college will face income and aid taxes that consume all of the principal, all of the earnings, and an additional several hundred dollars. This perverse outcome is the product of poor coordination between the tax code and the financial aid system.

**Doms**, **Dunn**, **Oliner**, and **Sichel** provide new estimates of depreciation rates for personal computers using an extensive database on used prices. Their results show that used PCs lose roughly half their remaining value, on average, with each additional year of use. The bulk of that decline reflects the downward revaluation of existing PCs, which is driven by the steep ongoing drop in the constant-quality prices of newly-introduced models. In addition, PCs

experience age-related declines in value that stem from the inability of older models to perform the full range of desired tasks and from the decision to retire installed units. The authors estimate that the resulting depreciation proceeds slowly during the early part of the PC's lifetime but then picks up. Their estimate of the depreciation rate averages about 22 percent annually over the first five years of service. However, this figure is sensitive to constant-quality price change. When the authors constrain their estimation to following the NIPA constant-quality price series, the depreciation rate increases to an average pace a bit above 34 percent. Finally, their estimates suggest that the current tax depreciation schedule for PCs is about right in a zero-inflation environment. However, because the tax code is not indexed for inflation, the tax allowances would be too small in present value for inflation rates above the very low level now prevailing.

Using tract-level data from the 1980, 1990, and 2000 censuses, **Sinai** and **Gyourko** estimate how the income tax-related benefits to owner-occupiers are distributed spatially across the United States. Even though the top marginal tax rate has fallen substantially since 1979 and the tax code more generally has become less progressive, the tax subsidy per household or owner was virtually unchanged between 1979 and 1989, and then rose substantially between 1989 and 1999. Geographically, gross program bene-

fits have been and remain very spatially targeted. At the state level, California's owners have received a disproportionate share of the subsidy flows over the past two decades. Their share of the gross benefits nationally has fluctuated from 19 to 22 percent. Depending upon the year, this is 1.8 to 2.3 times the Californians' share of the nation's owners. For the median state, the ratio of its share of tax benefits to its share of owners has declined over time, from 0.83 in 1979 to 0.76 in 1999. The data at the metropolitan area level reveal even more dramatic spatial targeting, and a spatial skewness that is increasing over time. Comparing benefit flows in 1979 in the top 20 areas versus those in the bottom 20 areas, owners in the highest subsidy areas received from 2.7 to 8.0 times the subsidy reaped by owners in the bottom group. By 1999, the analogous calculation finds that owners in the top 20 areas are receiving from 3.4 to 17.1 times more benefits than owners in any of the 20 lowest recipient areas. Despite the increasing skewness, the top subsidy-recipient areas tend to persist over time. In particular, the areas with very high benefit per owner are heavily concentrated in California and the New York City-to-Boston corridor. While taxes are somewhat higher in these places, it is the high and rising house prices that appear most responsible for the large and increasing skewness in the spatial distribution of benefits.

**Saez** uses income tax return data

from 1960 to 2000 to analyze the link between reported incomes and marginal tax rates. Only the top 1 percent incomes show evidence of behavioral responses to taxation. The data display striking heterogeneity in the size of responses to tax changes overtime, with no response either short-term or long-term for the very large Kennedy top rate cuts in the early 1960s, and striking evidence of responses, at least in the short term, to the tax changes since the 1980s. The 1980s' tax cuts generated a surge in business income reported by high-income individual taxpayers because of a shift away from the corporate sector, and the disappearance of business losses for tax avoidance. The Tax Reform Act of 1986 and the recent 1993 tax increase generated large short-term responses of wages and salaries reported by top income earners, most likely attributa-

ble to re-timing in compensation to take advantage of the tax changes. However, it is unlikely that the extraordinary trend upward of the shares of total wages accruing to top-wage income earners, which started in the 1970s and accelerated in the 1980s and especially the late 1990s, can be explained solely by the evolution of marginal tax rates.

**Desai and Gentry** analyze how corporate capital gains taxes affect the capital gains realization decisions of firms. They outline the tax treatment of corporate capital gains, the consequent incentives for firms with gains and losses, and the efficiency consequences of these taxes in the context of other taxes and capital market distortions. Despite receiving limited attention, corporate capital gains realizations have averaged 30 percent of individual capital gains realizations

over the last fifty years and have increased dramatically in importance over the last decade. By 1999, the ratio of net long-term capital gains to income subject to tax was 21 percent and was distributed across a variety of industries. Time-series analysis of aggregate realization behavior demonstrates that corporate capital gains taxes affect realization behavior significantly. Similarly, an analysis of firm-level investment and PPE disposal decisions and gain recognition behavior suggests an important role for these taxes in determining when firms raise money by disposing of assets and realizing gains.

These papers will be published by the MIT Press as *Tax Policy and the Economy, Volume 18*. They are also available at "Books in Progress" on the NBER's website.

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## Developing and Sustaining Financial Markets, 1820-2000

The most recent NBER/Universities Research Conference took place in Cambridge on December 5 and 6. Organizers Lance E. Davis, NBER and California Institute of Technology; Larry D. Neal, NBER and University of Illinois; and Eugene N. White, NBER and Rutgers University, put together this program on the history of financial markets:

**Robert E. Wright**, New York University, “Early U.S. Financial Development in Comparative Perspective: New Data, Old Comparisons”

**Daniel Waldenström**, University of California, Los Angeles, “Understanding the Emergence of Stock Exchanges: The Case of Pre-WWI Stockholm”  
Discussant: Randal Michie, University of Durham, England

**William L. Silber**, New York University, “What Happened to

Liquidity When World War I Shut the NYSE?”

Discussant: John James, University of Virginia

**Marc Flandreau**, University of California, Berkeley, and **Pierre Sicsic**, Banque de France, “Speculative Credit and the Money Market: The *Marché des Reports* in France 1875-1914”

Discussant: Peter Lindert, University of California, Davis

**Marc Flandreau** and **Nathan Sussman**, Hebrew University, “Old Sins: Exchange Clauses and European Foreign Lending in the 19<sup>th</sup> Century”

**Robert J. Weiner**, George Washington University, “Financial Innovation in an Emerging Market: Petroleum Derivatives Trading in the 19<sup>th</sup> Century”

Discussant: Kirsten Wandschneider, Middlebury College

**Richard S. Grossman**, Wesleyan University, and **Stephen H. Shore**, University of Pennsylvania, “The Cross-Section of Stock Returns before World War I”

**Hans-Joachim Voth**, MIT, “Stock Price Volatility and Political Uncertainty: Evidence from the Interwar Period”

Discussant: Benjamin R. Chabot, NBER and University of Michigan

**Efraim Benmelech**, University of Chicago, “Asset Salability and Debt Maturity: Evidence from the 19<sup>th</sup> Century American Railroads”

**Gerhard Kling**, University of Tuebingen, “Disclosure of Mergers without Regulatory Restrictions: Comparing Insider Trading in the year 1908 and 2000 in Germany”  
Discussant: Marc D. Weidenmier, NBER and Claremont McKenna College

**Wright** presents new estimates of the assets of U.S. financial intermediaries and the number and authorized capitalization of U.S. corporations. He also compares the U.S. financial system to that of Great Britain and New York state’s financial system to that of Canada, two contiguous entities with similar populations. The available data confirm the narrative evidence that New York’s financial development was decades ahead of Canada’s. Also, by about 1830, the U.S. financial system compared favorably with Britain’s. Finally, Wright shows that by 1990 many nations had yet to reach the level of financial “depth” (defined assets of financial intermediaries/GDP) achieved by the U.S. financial system before 1830.

**Waldenström** describes and analyzes the emergence of the Stockholm Stock Exchange and its initial formation of ownership and governance. The exchange was initiated by private actors but became publicly owned because of current market regulation. The author also sets out a research agenda for the exploration and evalua-

tion of the early Nordic stock markets. The suspension of trading on the New York Stock Exchange for more than four months following the outbreak of World War I fostered a substitute market on New Street as a source of liquidity. The New Street market suffered from impaired price transparency because its transactions were not disseminated on the NYSE ticker and its quotations were blacklisted at the leading newspapers. **Silber** shows that despite the incomplete information flow and the somewhat wider bid-ask spreads compared with the New York Stock Exchange, New Street offered economically meaningful liquidity services. The interference with price transparency turned an individual stock’s reputation for liquidity into an important added variable in explaining the structure of bid-ask spreads on New Street.

**Flandreau** and **Sicsic** study the relationship between the money market and speculative credit in France in the last part of the 19th century. To them it seems clear that, despite the

size of the “pool” of speculative credit, the *marché des reports* gradually developed as a complementary market to the money market. This happened via a multitude of mechanisms, the central trend of which was the gradual linking of the interest rate for investments in trade bills to the rate for *reports* in the strict sense. This coupling was the result of the establishment of a robust official market on the Paris stock exchange and the subsequent rise in competition between banks and this market, which ended up improving the efficiency of the *marché des reports* in the 1890s. These developments took place in two stages. First there was a consolidation of the Paris *parquet*, confirmed by the geographical pattern of the speculation during the 1881-2 crash. Second, the development of an over-the-counter market — the *marché des reports en banque* — resulted in the weakening of the monopoly or virtual monopoly enjoyed by the *agents de change*, and put them under competitive pressure. This mechanism brought brokerage costs down in practice, sev-

eral years before the Fleury-Ravarin Bill. This Bill, which was of such interest to contemporary writers, did little more than institutionalize a fact. The natural extension of this situation was, of course, the centralized clearing of stock exchange *reports* or, in other words, the quotation by the *agents de change* of a single rate for all the securities used in *reports*. This did not happen until after WWI though.

**Flandrau** and **Sussman** challenge a popular explanation for “original sin” — the default prone borrowing of long-term debt in foreign exchange by emerging markets — that emphasizes the lack of credibility and commitment of governments which prevents them from borrowing in their own currency. Basing their account on the history of emerging market borrowing in the nineteenth century, the authors offer an explanation based on historical path dependence. They document that almost all IPOs of governments in foreign markets were in foreign exchange, or with foreign exchange clauses, independent of those countries’ institutional features. They show that a small number of countries could circulate debt denominated in their own currency in secondary markets, again irrespective of their constitutional setup. The authors argue that market liquidity can explain both phenomena. Having an internationally circulating currency allows countries to circulate their debt in secondary markets. Going for an IPO in a large financial center is an attempt to tap the greater liquidity of that center’s money market and currency. It makes perfect sense to borrow then, in that center’s currency. The evolution of vehicle currencies and liquid money markets has more to do with the historical evolution of trade, going back to medieval times, than with institutional reform. Escaping from original sin requires that the country emerge as a leading economic power — a rare historical event, reserved for the United States of the nineteenth century and Japan of the twentieth century.

**Weiner** presents an historical investigation of a derivatives market whose very existence has been forgotten by economists, notwithstanding its importance at the time — exchange

trading of oil spot, futures, and options contracts in the late nineteenth century. The very different time period and institutions provide a laboratory for comparison of empirical results from modern futures markets. The first modern futures trading in an industrial commodity, crude oil, had disappeared before economists became interested in derivatives markets, and thus does not appear on the long list of commodities traded at one time or another on futures exchanges. When futures trading in petroleum again became big business in the 1980s, it was described in both the academic and trade press as something new, made possible for the first time. Had the early oil exchanges been unsuccessful, or of minor importance, their disappearance without a trace would be understandable. Such is not the case, however; the exchanges were among the largest early cases of centralized trading in the United States. Contemporary accounts claimed that the volume of business transacted was exceeded only by the New York and San Francisco Stock Exchanges. Petroleum was big business in late-nineteenth century America, ranking only behind wheat and cotton among exports. The United States produced virtually all of the world’s oil, and about two-thirds of production was exported (chiefly to Europe), but most of it was refined in the United States. The exchanges started trading in the early 1870s, and reached their height in the early 1880s. By the late 1880s, trading had declined precipitously as refining (the downstream industry) was monopolized by the Standard Oil Trust. By the mid-1890s, the spot and futures markets had dried up, and been replaced in part by vertical integration, and in part by “posted prices,” representing what the Standard was willing to pay producers in each field. Derivatives markets in petroleum would not return until the 1970s, by which time the first era had been long forgotten.

**Grossman** and **Shore** examine the cross-section of stock returns using an original dataset containing annual observations on price, dividends, and shares outstanding for nearly all stocks listed on U. K.

exchanges between 1870 and 1913. The authors construct portfolios based on past returns, size, and dividend yield and compare the properties of these portfolios created with historical U.K. data to identically constructed portfolios created with CRSP data. Unlike the CRSP data, the historical U.K. data do not display excess returns for portfolios of small stocks or portfolios of stocks that have done badly in the past five years. However, portfolios sorted on dividend yield have similar return dynamics in both samples. Stocks paying no dividends have higher returns; among stocks paying dividends, returns increase with the dividend yield. The historical data have the same return pattern as modern data for portfolios sorted on dividend yield, but not for portfolios sorted on past performance. The presence of one anomaly but not the other in historical data can be reconciled by the high degree of responsiveness of dividends to returns during this period.

In 1914, German stock market capitalization was higher relative to GDP than in the United States, and the country financed a larger share of capital formation via equity. Many countries that have largely bank-based financial systems today had thriving equity markets at the beginning of the century. **Voth** examines the causes of the divergent paths of financial system development highlighted in the recent work by Rajan and Zingales, who emphasize the role of the Great Depression in determining subsequent developments. Voth analyzes the extent to which political uncertainty, driven by institutional fragility and the tumultuous politics of the 1920s and 1930s, caused instability in equity markets. Stock prices swung widely during the Great Depression, contributing to the excess volatility highlighted by Shiller and undermining the case for markets-based financial systems. Voth examines the Merton/Schwert hypothesis, that concern about the survival of the capitalist system was crucial. Using a panel data set on riots, demonstrations, and other indicators of instability for 32 developed and developing countries during the interwar period, Voth shows that political instability caused drastic falls in stock prices.

Much of the increase in volatility during the Great Depression can be explained by political factors. Voth estimates the probability of revolution and shows that higher risks of turmoil are associated with greater volatility.

**Benmelech** studies the relationship of asset salability to capital structure. Using a unique dataset of more than 200 nineteenth century American railroads, he finds that salability and debt maturity are strongly correlated. Railroads that had more redeployable cars, and that conformed to the standard track gauge, had longer debt maturities. Moreover, he finds that the

potential demand for the railroads' rolling stock and track mileage were significant determinants of debt maturity. Interestingly, there is no evidence that salability or industry-demand for assets were correlated with leverage. Similar results emerge from a study of COMPUSTAT firms in 1980-2001, suggesting that the results in this paper are not sample specific, and can be interpreted consistently using Shleifer and Vishny's (1992) model.

Who gains from mergers? **Kling** concentrates on insiders and outsiders by investigating the adaptation process of stock prices around public merger

announcements. The means of disclosure is essential. If firms hide information, they will hurt outsiders. Hiding information does not yield higher cumulated abnormal returns — but the higher the expected gains from mergers, the higher the incentive to hide information. Hence, it should be worthwhile to restrict insider trading by forcing firms to uncover mergers. In contrast to the year 1908, premerger gains in the year 2000 are attributable to irrational speculation and not to insider trading.

## Financing Retirement in Japan

The Sixteenth Annual TRIO Conference, so-named because it is jointly sponsored by the NBER, the Centre for Economic Policy Research (CEPR), and the Tokyo Center for Economic Research (TCER), took place on December 8 and 9 in Tokyo. This year's conference focus was "Financing Retirement." Organizers were Takeo Hoshi, NBER and University of California, San Diego; Sadao Nagaoka, Hitotsubashi University and TCER; and Toshiaki Tachibanaki, Kyoto University and TCER. The program was:

**Olivia S. Mitchell**, NBER and University of Pennsylvania, and **John Piggott**, University of New South Wales, "Unlocking Housing Equity in Japan"  
Discussants: Pierre Pestieau, Universite de Liege and CEPR, and Miki Seko, Keio University and TCER

**Frank de Jong**, University of Amsterdam and CEPR, "Pension Fund Investments and the Valuation of Liabilities under Conditional Indexation"  
Discussants: Toni Braun, University of Tokyo, and Keisuke Ito, Mizuho-DL Financial Technology Co., Ltd.

**Toshiaki Tachibanaki** and **Tomohiko Takeuchi**, Kyoto University and TCER, "The Differences in the Economic Effects Between the DB Plan and the DC Plan"  
Discussants: Olivia S. Mitchell, and Masaharu Usuki, NLI Research Institute

**Robert Dekle**, University of Southern California, "Financing Consumption in an Aging Japan: The Role of Foreign Capital Inflows and Immigration"  
Discussants: Toshihiro Ihori, University of Tokyo and TCER,

and Makoto Saito, Hitotsubashi University and TCER

**Takashi Oshio**, Tokyo Gakugei University and TCER, "Social Security and Trust Fund Management"  
Discussants: Frank De Jong, and Yasushi Iwamoto, Hitotsubashi University and TCER

**Pierre Pestieau**, "Social Security and the Well-Being of the Elderly"  
Discussants: Robert Dekle, and Tokuo Iwaisako, Hitotsubashi University

**Kohei Komamura**, Toyo University and TCER, and **Atsuhiko Yamada**, Keio University and TCER, "Who Bears the Burden of the Social Insurance?"  
Discussants: Takero Doi, Keio University and TCER, and John Piggott

Releasing equity in housing via reverse mortgages (RMs) may be a natural mechanism for boosting consumption, reducing public pension liability, and mitigating the demand for long-term care facilities in Japan. In order to implement RMs, **Mitchell** and **Piggott** find, existing inhibitors would

need to be removed. For example, RMs might be exempted from the capital gains tax and transactions taxes. In addition, more attention might be focused on the tax status of annuity income flows and on interest rate deductions for RMs. Clearly, housing market reforms to enhance informa-

tion flows would be needed, particularly regarding new and existing housing trades. This would enable the securitization of housing loans and lines of credit. Finally, improvements in other aspects of capital markets, including the establishment of reinsurance mechanisms to help lenders offer these

reverse mortgages while having some protection against crossover risk, would be important. The infrastructure required to build RM markets is not simple, and in the Japanese case, the demand will be dampened by the fact that residential housing values appear to be declining. This fact, plus low interest rates, imply that lenders will find reverse mortgages less appealing than otherwise. Nevertheless, RMs can be a good way to finance elderly consumption in Japan, particularly against the backdrop of governmental financial stringencies.

**De Jong** reviews the investment policy of collective pension plans. The defined benefit nature of these plans would call for an investment portfolio that consists entirely of long-term index-linked bonds. In practice, pension plans have substantial investments in equities and real estate. De Jong suggests two reasons to invest in equities: the lack of a well-developed market in index-linked bonds, and deliberate deviations from the defined benefit nature of the plan. Further, he assesses the value of limited or conditional indexation options found in many plans.

There are several problems with the old-age pension systems in Japan, both public and enterprise systems. **Takeuchi** and **Tachibanaki** are concerned with the latter. They note that public pension benefits may be reduced because: 1) the seriously lower birth rate and aging of the population will prevent retired people from enjoy the current level of benefits; and 2) the slower growth rate of the economy will decrease the amount of social

insurance revenues (that is, contributions) in public pension programs in the future. Under these circumstances, it is desirable to develop enterprise pension programs in order to maintain the current level of income for retired people. In reality, though, enterprise pension systems in Japan have not developed sufficiently, although there have been several reforms. The authors examine and discuss these positive and negative aspects, both theoretically and empirically.

**Dekle** projects the impact of demographic change on Japanese capital flows by simulating the impact of aging on Japanese saving and investment rates. He projects declining saving and investment rates, with saving rates declining faster than investment rates, leading to current account deficits and capital inflows. He also predicts deteriorating government budget balances, unless there is drastic fiscal reform. A unique feature of his paper is that he also examines scenarios in which the government allows sizable immigration (400,000 immigrants per year from 2005 to 2040) into Japan. He shows that, with this immigration, Japan's projected capital inflows as a percentage of consumption will be much smaller, because the higher labor force will be able to raise Japan's GDP to help sustain its growing elderly population. With the larger labor force from immigration, Japanese GDP in 2020 will be 22 percent higher, and 50 percent higher by 2040. Finally, with immigration, social security and healthcare spending as a percentage of GDP will be lower, meaning that

future tax increases can be smaller.

**Oshio** asks why and to what extent the government should have a social security trust fund, and how it should manage the fund in the face of demographic shocks. He shows that having a government trust fund in some form is necessary, given an aging population, to achieve the (modified) golden rule or to offset the negative income effect of a pay-as-you-go system. But in a closed economy, it is not advisable to use such a trust fund as a buffer for demographic shocks, because it could lead to a widening of intergenerational inequality. Oshio also discusses the policy implications of his analysis for the social security reform debate in Japan.

**Pestieau** clarifies the concept of generosity as applied to social security systems. He distinguishes among three types of generosity with the possibility of trade-offs. There is the generosity towards early retirement, the overall generosity of an old age system, and the generosity towards retirees with low entitlements.

Using the society-managed health insurance data, which is a cross-sectional time-series and covers 1670 health insurance societies for seven years (FY1995-2001), **Komamura** and **Yamada** find for the first time in Japan that half of the employer's contribution to health insurance is shifting back to the employees in the form of wage reduction. On the other hand, the authors cannot find such evidence for the contribution to long-term care insurance using a two-year (FY2000-01) panel data set.

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### NBER Researcher Shares Nobel Prize in Economics

NBER Research Associate Robert F. Engle of New York University's Stern School of Business will share the 2003 Nobel Prize in Economics with Clive W. J. Granger.

Engle has been affiliated with the NBER since 1987 and is a member of the Program on Asset Pricing. He and Granger were awarded the prize for

their development of statistical techniques used to measure investment risk and to track economic trends.

He now joins a long list of NBER researchers who have received the Prize, including: George Akerlof, Michael Spence, and Joseph E. Stiglitz in 2001; James J. Heckman and Daniel L. McFadden, 2000; Robert C. Merton and

Myron S. Scholes, 1997; Robert E. Lucas, Jr., 1995; and Robert W. Fogel, 1993. Other NBER researchers who have won the Nobel Prize in Economics are Simon S. Kuznets, Milton Friedman, Theodore W. Schultz, George J. Stigler, and Gary S. Becker.

### Entrepreneurship

The NBER's Working Group on Entrepreneurship met in Cambridge on October 10. Josh Lerner, NBER and Harvard Business School, organized this program:

**William M. Gentry**, NBER and Williams College, and **R. Glenn Hubbard**, NBER and Columbia University, "Tax Policy and Entry into Entrepreneurship"  
Discussant: Julie B. Cullen, NBER and University of Michigan

**Francesco Caselli**, NBER and Harvard University, and **Nicola Gennaioli**, Harvard University, "Dynastic Management"  
Discussant: Ray Fisman, NBER and Columbia University

**David J. MacKenzie**, Stanford University, and **Chris Woodruff**, University of California, San Diego, "Do Entry Costs Provide an Empirical Basis for Poverty Traps? Evidence from Mexican

Microenterprises"  
Discussant: Paul Gompers, NBER and Harvard University

**Augustin Landier**, University of Chicago, and **David Thesmar**, INSEE, "Financial Contracting with Optimistic Entrepreneurs: Theory and Evidence"  
Discussant: Jeremy C. Stein, NBER and Harvard University

There has been comparatively little analysis to date of the effects of changes in marginal tax rates on entrepreneurial entry. Yet the elasticity of entrepreneurial decisions with respect to tax changes is likely to be greater than with respect to decisions about hours worked, and recent research has linked entrepreneurship, mobility, and household wealth accumulation. Both the level and the progressivity of tax rates can affect decisions about risky activities. The tax system offers insurance for taking risk because taxes depend on outcomes; however, asymmetric taxes on different outcomes, such as progressive rates, may discourage risk taking. Using the Panel Study of Income Dynamics for 1979-93,

**Gentry** and **Hubbard** incorporate both of these effects of the tax system in estimating the probability that people enter self-employment. While the level of the marginal tax rate does not affect entry into self-employment in a consistent manner across specifications, the progressivity of marginal tax rates does discourage entry into self-employment and into business ownership. The estimates of the effects of the convexity of the tax schedule on entrepreneurial entry are rather large. For example, Gentry and Hubbard estimate that the Omnibus Budget Reconciliation Act of 1993, which raised the top marginal tax rate, lowered the probability of entry into self-employment for upper-middle-income

households by as much as 20 percent. These estimated effects are robust to controlling for differences in family structure, spousal income, and measures of transitory income.

Dynastic management is the intergenerational transmission of control over assets typical of family-owned firms. It is pervasive around the world, but especially in developing countries. **Caselli** and **Gennaioli** argue that dynastic management is a potential source of inefficiency: if the heir to the family firm has no talent for managerial decisionmaking, then meritocracy fails. They present a simple model of the macroeconomic causes and consequences of this phenomenon. In their model, the incidence of dynastic man-

agement depends on the severity of asset-market imperfections, on the economy's saving rate, and on the degree of inheritability of talent across generations. The authors introduce novel channels through which financial-market failures and saving rates affect aggregate total factor productivity. Their simulations suggest that dynastic management may be a substantial contributor to observed cross-country differences in productivity.

Recent theoretical literature in development economics has shown that non-convex production technologies can result in low-growth poverty traps. **McKenzie** and **Woodruff** use detailed microenterprise surveys in Mexico to examine the empirical evidence for these non-convexities at low levels of capital stock. While the theory emphasizes non-divisible start-up costs that exceed the wealth of many potential entrepreneurs, the authors

show start-up costs to be very low in some industries. Much higher returns are found at low levels of capital stock than at higher levels, and this remains true after controlling for firm characteristics and measures of entrepreneurial ability. Overall, the authors find little evidence of production non-convexities at low levels of capital. The absence of non-convexities is significant, because it suggests that access to startup capital does not determine the ultimate size of the enterprise.

**Landier** and **Thesmar** look at the effects of entrepreneurial optimism on financial contracting and corporate performance. Optimism may increase effort, but is bad for adaptation decisions, because the entrepreneur underweights negative information. The first-best contract with an optimist uses contingencies for two distinct purposes: 1) "bridging the gap in beliefs" by letting the entrepreneur

take a bet on his project's success; and 2) imposing adaptation decisions in bad states. When the contract space is restricted to debt, there may be a separating equilibrium in which optimists self-select in short-term debt and realists in long-term debt. The authors apply their theory to a large dataset of entrepreneurs. First, they find that differences in beliefs may be (partly) explained by the usual determinants put forward in psychology and management literature. Second, in line with the two main predictions of their model, they find that optimists tend to borrow more short term and that those who borrow more short term perform better. Finally, firms run by optimists tend to grow less, die sooner, and to be less profitable. The authors view this as a confirmation that their measure of optimism does not proxy high risk-high returns projects.

## International Finance and Macroeconomics

The NBER's Program on International Finance and Macroeconomics met in Cambridge on October 10. Charles M. Engel, NBER and University of Wisconsin, and Linda Tesar, NBER and University of Michigan, organized this program:

**Paul R. Bergin**, NBER and University of California, Davis, and **Reuven Glick**, Federal Reserve Bank of San Francisco, "Endogenous Nontradability and Macroeconomics Implications" Discussant: Paolo Pesenti, Federal Reserve Bank of New York

**Anusha Chari**, University of Michigan, and **Peter Blair Henry**, NBER and Stanford University, "Capital Account Liberalization,

Investment, and the Invisible Hand" Discussant: Rui Albuquerque, University of Rochester

**Robert P. Flood**, International Monetary Fund, and **Andrew K. Rose**, NBER and University of California, Berkeley, "Equity Integration in Times of Crisis" Discussant: Maria Vassalou, Columbia University

**Enrique G. Mendoza**, NBER and University of Maryland, and **Katherine A. Smith**, U.S. Naval Academy, "Margin Calls, Trading Costs, and Asset Prices in Emerging Markets: The Financial Mechanics of the 'Sudden Stop' Phenomenon" Discussant: Fabrizio Perri, New York University

**Giancarlo Corsetti**, University of Rome; **Bernardo Guimares**, Yale University; and **Nouriel Roubini**, NBER and New York University, "International Lending of Last Resort and Moral Hazard: A Model of IMF's Catalytic Finance" Discussant: Olivier Jeanne, International Monetary Fund

**Amartya Lahiri**, Federal Reserve Bank of New York; **Rajesh Singh**, Iowa State University; and **Carlos A. Vegh**, NBER and University of California, Los Angeles, "Segmented Asset Markets and Optimal Exchange Rate Regimes" Discussant: Michael Devereux, University of British Columbia

**Bergin** and **Glick** propose a new way of thinking about nontraded goods in an open-economy macro model. They develop a simple method for analyzing a continuum of goods with heterogeneous trade costs, and explore how these costs determine the

endogenous decision by a seller of whether to trade a good internationally. This way of thinking is appealing in that it provides a natural explanation for a prominent puzzle in international macroeconomics: that the relative price of nontraded goods tends to

move much less volatily than the real exchange rate. Because nontradedness is an endogenous decision, the good on the margin forms a linkage between the prices of traded and nontraded goods, preventing the two price indexes from wandering too far apart.

Bergin and Glick find that this mechanism has implications for other macroeconomic issues that rely on the presence of nontraded goods.

Using a new dataset of 369 manufacturing firms in developing countries, **Chari** and **Henry** present the first firm-level analysis of capital account liberalization and investment. In the three-year period following liberalizations, the growth rate of the typical firm's capital stock exceeds its pre-liberalization mean by an average of 4.1 to 5.4 percentage points per year. The authors use a simple model of Tobin's  $q$  to decompose the firms' post-liberalization changes in investment into: 1) the country-specific change in the risk-free rate; 2) firm-specific changes in equity premiums; and 3) firm-specific changes in expected future earnings. Panel data estimations show that an increase in expected future earnings of 1 percentage point predicts a 2.9 to 4.1 percentage point per-year increase in capital stock growth. The country-specific shock to firms' costs of capital predicts a 2.3 percentage point per-year increase in investment, but firm-specific changes in risk premiums are not significant. These results stand in contrast to the view that investment and fundamentals are unrelated during liberalization episodes.

**Flood** and **Rose** apply a simple new test for asset integration to two episodes of crisis in financial markets. Their technique is based tightly on a general intertemporal asset-pricing model, and relies on estimating and comparing expected risk-free rates across assets. Expected risk-free rates are allowed to vary freely over time, constrained only by the fact that they are equal across (risk-adjusted) assets. Assets are allowed to have general risk characteristics, and are constrained only by a factor model of covariances

over short time periods. The technique is undemanding in terms of both data and estimation. The authors find that expected risk-free rates vary dramatically over time, unlike short interest rates. The S&P 500 Market seems to be generally well integrated, but the level of integration falls temporarily during the Long-Term Capital Markets crisis of October 1998. By way of contrast, the Korean stock market generally remains internally integrated through the Asian crisis of 1997. The level of equity integration between Japan and Korea is low and falls further during late 1997.

"Sudden Stops" experienced during emerging markets crises are characterized by large reversals of capital inflows and the current account, deep recessions, and collapses in asset prices. **Mendoza** and **Smith** propose an open-economy equilibrium asset-pricing model in which financial frictions cause Sudden Stops. Margin requirements impose a collateral constraint on foreign borrowing by domestic agents and trading costs distort asset trading by foreign securities firms. At equilibrium, margin constraints may or may not bind depending on portfolio decisions and equilibrium asset prices. If margin constraints do not bind, then productivity shocks cause a moderate fall in consumption and a widening current account deficit. If debt is high relative to asset holdings, then the same productivity shocks trigger margin calls, forcing domestic agents to fire-sell equity to foreign traders. This sets off a Fisherian asset-price deflation and subsequent rounds of margin calls. A current account reversal and a collapse in consumption occur when equity sales cannot prevent a sharp rise in net foreign assets.

**Corsetti** and **Guimares** present

an analytical framework for studying how an international institution that provides liquidity can help to stabilize financial markets by coordination of agents' expectations, and how it influences the incentives faced by policymakers to undertake efficiency-enhancing reform. They show that the influence of such an institution increases with the size of its intervention and the precision of its information. More liquidity support and better information make agents more willing to roll over their debt and thus reduces the probability of a crisis. In contrast to the conventional view stressing debtor moral hazard, here liquidity provision and good policies can be strategic complements: the domestic government would not undertake costly policies/reforms unless contingent liquidity assistance was provided.

**Lahiri** and **Singh** revisit the issue of the optimal exchange rate regime in a flexible price environment. Their key innovation is analyzing this question in the context of environments where only a fraction of agents participate in asset market transactions (that is, asset markets are segmented). They show that flexible exchange rates are optimal under monetary shocks and fixed exchange rates are optimal under real shocks. These findings are the exact *opposite* of the standard Mundellian prescription derived via the sticky price paradigm wherein fixed exchange rates are optimal if monetary shocks dominate while flexible rates are optimal if shocks are mostly real. These results suggest that the optimal exchange rate regime should depend not only on the type of shock (monetary versus real) but also on the type of friction (goods market friction versus financial market friction).

## Economic Fluctuations and Growth

The NBER's Program on Economic Fluctuations and Growth held its fall research meeting on October 17 in Chicago. Mark Gertler, NBER and New York University, and Patrick Kehoe, Federal Reserve Bank of Minneapolis, organized this program:

**Mikhail Golosov**, University of Minnesota, and **Robert E. Lucas, Jr.**, NBER and University of Chicago, "Menu Costs and Phillips Curves"  
Discussant: Ricardo J. Caballero, NBER and MIT

**Harold L. Cole**, University of California, Los Angeles; **Ron Leung**, University of Minnesota;

and **Lee E. Ohanian**, NBER and University of California, Los Angeles, "Deflation, Real Wages, and the International Great Depression: A Productivity Puzzle"  
Discussant: Lawrence Christiano, NBER and Northwestern University

**Marc P. Giannoni**, Columbia University, and **Michael Woodford**, NBER and Princeton University, "Optimal Inflation Targeting Rules"  
Discussant: Varadarajan Chari, NBER and University of Minnesota

**Raphael Bergoeing**, Universidad de Chile, and **Timothy J. Kehoe**, University of Minnesota, "Trade Theory and Trade Facts"

Discussant: Donald R. Davis, NBER and Columbia University

**Richard Rogerson**, NBER and Arizona State University, "Structural Transformation and the Deterioration of European Labor Market Outcomes"  
Discussant: Daron Acemoglu, NBER and MIT

**Martin Lettau**, **Sydney C. Ludvigson**, and **Jessica A. Wachter**, NBER and New York University, "The Declining Equity Premium: What Role Does Macroeconomic Risk Play?"  
Discussant: John H. Cochrane, NBER and University of Chicago

**Golosov** and **Lucas** develop a model of a monetary economy in which individual firms are subject to idiosyncratic productivity shocks as well as general inflation. Sellers can change price only by incurring a real "menu cost." The authors calibrate this cost and the variance and autocorrelation of the idiosyncratic shock using a new U.S. dataset of individual prices from Klenow and Kryvtsov. The prediction of the calibrated model for the effects of high inflation on the frequency of price changes accords well with the Israeli evidence obtained by Lach and Tsiddon. The model also is used to conduct numerical experiments on the economy's response to credible and incredible disinflations and to other shocks. In none of the simulations conducted did monetary shocks induce large or persistent real responses.

The high real wage story is one of the leading hypotheses for how deflation caused the International Great Depression. The story is that worldwide deflation, combined with incomplete nominal wage adjustment raised real wages in a number of countries, and that these higher real wages reduced employment as firms moved up their labor demand curves. **Cole**, **Ohanian**, and **Leung** study the high real wage hypothesis in an internation-

al cross section of 17 countries during 1930-3 using dynamic, general equilibrium monetary models. They find that the high real wage story by itself does not account for output changes in the international cross section. The models make large errors predicting output in the international cross section, largely because the correlation between real wages and output in the models is  $-1$ , while this correlation is positive in the data. This means that the worldwide Depression was not just firms moving up their labor demand curves in response to high real wages. Instead, accounting for the Depression requires a shock that shifts labor demand curves differentially across countries. The authors add productivity shocks to the model as a candidate labor demand shifter. They find that the productivity shocks in the model are very similar to productivity changes in the data. They also find that productivity shocks account for about 2/3 of output changes, while monetary shocks account for about 1/3 of output changes.

**Giannoni** and **Woodford** characterize optimal monetary policy for a range of alternative economic models, applying the general theory developed in their 2002 paper. The rules computed here have the advantage of being optimal regardless of the assumed

character of exogenous additive disturbances, although other aspects of the model specification do affect the form of the optimal rule. In each case, optimal policy can be implemented though a flexible inflation targeting rule, under which the central bank is committed to adjusting its interest-rate instrument so as to ensure that projections of inflation and other variables satisfy a target criterion. For any given parameterization of the structural equations, the authors show which additional variables, beyond the inflation projection, should be taken into account, and to what degree. They also explain what relative weights should be placed on projections for different horizons in the target criterion, and the manner and degree to which the target criterion should be history-dependent. They then assess the likely quantitative significance of the various factors considered in the general discussion by estimating a small, structural model of the U.S. monetary transmission with explicit optimizing foundations. An optimal policy rule is computed for the estimated model, and it corresponds to a multi-stage inflation-forecast targeting procedure. Finally, they consider the degree to which actual U.S. policy over the past two decades has conformed to the optimal target criteria.

**Bergoeing** and **Kehoe** quantita-

tively test the “new trade theory” based on product differentiation, increasing returns, and imperfect competition. They use a model that allows both changes in the shares of income among industrialized countries, emphasized by Helpman and Krugman (1985), and nonhomothetic preferences, emphasized by Markusen (1986), to affect trade volumes and directions. In addition, they generalize the model to allow changes in relative prices to have large effects. The authors test the model by calibrating it to 1990 data and then “backcasting” to 1961 to see what changes in crucial variables between 1961 and 1990 are predicted by the theory. The results show that, although the model is capable of explaining much of the increased concentration of trade among industrialized countries, it is not capable of explaining the enormous increase in the ratio of trade to income.

**Rogerson** makes three key points in his paper. First, he argues that much of the literature on the European labor market problem has misdiagnosed it by focusing on relative unemployment

rather than relative employment levels. Specifically, the European labor market problem seems to date back to the mid-1950s. Second, the key to understanding the source of the European labor market problem is an understanding of why Europe has not developed a market service sector more similar to that of the United States as it has closed the gap with the United States in terms of output per hour. Third, Rogerson shows that a story in which productivity differences and/or taxes are central can potentially go a long way toward accounting for the relative deterioration of European labor market outcomes. To be sure, the model analyzed here is very simple and it will be important to see the extent to which the quantitative conclusions are affected by adding various features.

Aggregate stock prices, relative to virtually any sensible indicator of fundamental value, soared to unprecedented levels in the 1990s. Even today, after the market declines since 2000, they remain well above historical norms.

**Lettau, Ludvigson, and Wachter** consider one particular explanation for this:

a fall in *macroeconomic* risk, or the volatility of the aggregate economy. The authors estimate a two-state regime-switching model for the volatility and the mean of consumption growth, and find evidence of a shift to substantially lower consumption volatility at the beginning of the 1990s. They then show that there is a strong and statistically robust correlation between low macroeconomic volatility and high asset prices: the estimated posterior probability of being in a low volatility state explains 30 to 60 percent of the post-war variation in the log price-dividend ratio, depending on the measure of consumption analyzed. Next, the authors study a rational asset pricing model with regime switches in both the mean and standard deviation of consumption growth, where the probabilities of a regime change are calibrated to match estimates from post-war data. Plausible parameterizations of the model account for almost all of the run-up in asset valuation ratios observed in the late 1990s.

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## Public Economics

The NBER's Program on Public Economics met in Cambridge on October 30-31. Program Director James M. Poterba of MIT organized this agenda:

**Maria Cancian**, University of Wisconsin, Madison, and **Arik Levinson**, NBER and Georgetown University, "Labor Supply and Participation Effects of the Earned Income Tax Credit: Evidence from the National Survey of American's Families and Wisconsin's Supplemental Benefit for Families with Three Children"  
Discussant: John Karl Scholz, NBER and University of Wisconsin

**Antonio Rangel**, NBER and Stanford University, and **B. Douglas Bernheim**, NBER and Stanford University, "Emotions,

Cognition, and Savings: Theory and Policy"  
Discussant: Sendhil Mullainathan, NBER and MIT

**Zoran Ivkovic**, University of Illinois; **James M. Poterba**; and **Scott Weisbenner**, NBER and University of Illinois, "Tax-Motivated Trading By Individual Investors"  
Discussant: Aleh Tsyvinsky, NBER and University of California, Los Angeles

**Christopher House**, University of Michigan, and **Matthew D. Shapiro**, NBER and University of Michigan, "Phased in Tax Cuts and Economic Activity"  
Discussant: Alan J. Auerbach, NBER and University of California, Berkeley

**Henrik J. Kleven** and **Claus T. Kreiner**, University of Copenhagen; **Herwig Immervoll**, University of Cambridge; and **Emmanuel Saez**, NBER and University of California, Berkeley, "Welfare Reform in European Countries: A Micro-Simulated Analysis"  
Discussant: Jorn-Steffen Pischke, NBER and London School of Economics

**Shinichi Nishiyama**, Congressional Budget Office, and **Kent Smetters**, NBER and University of Pennsylvania, "Consumption Taxes and Economic Efficiency in a Stochastic OLG Economy"  
Discussant: Kenneth L. Judd, NBER and Stanford University

**Cancian** and **Levinson** examine the labor market consequences of the Earned Income Tax Credit (EITC), comparing labor market behavior of eligible parents in Wisconsin, which supplements the federal EITC for families with three children, to that of similar parents in states that do not supplement the federal EITC. Most previous studies have relied on changes in the EITC over time, or on EITC eligibility differences for families with and without children, or have extrapolated from measured labor supply responses to other tax and benefit programs. In contrast, this cross-state comparison examines a larger difference in EITC benefits among families with two or three children.

**Bernheim** and **Rangel** construct a new, simple model of savings in which individuals can make mistakes. They use the model to study the impact on savings and welfare of changes in the environment, institutions, and policy. The authors show that this alternative formulation leads to conclusions that are at odds with some of the pre-suppositions of the previous literature. In particular, even though individuals make mistakes involving overconsumption, the authors

show that one cannot presuppose that there is under-saving. Paradoxically, in this model individuals aware of their self-control problem can end up over-saving. Further, one cannot presuppose that welfare-improving policies increase savings. In fact, for plausible ranges of parameters, welfare-increasing changes in the environment, institutions, and policies can decrease savings.

**Ivkovic**, **Poterba**, and **Weisbenner** use a large database, containing nearly 100,000 large individual stock purchases, to study the factors that affect the realization of capital gains and losses. These factors include the holding period, the calendar month, and the accrued gain or loss since the time of purchase. A particularly appealing feature of the dataset is the ability to compare investors' realizations in their taxable and tax-deferred accounts. The authors reach four conclusions. First, for large stock purchases, there is a strong lock-in effect for capital gains in taxable accounts after the stock has been held for a few months. Second, there is evidence of trading behavior that is consistent with year-end tax-loss selling. In taxable accounts in December, and especially in the last week of December, investors are more

likely to sell losers than winners. The pattern for other months is the opposite. The December selling effect is particularly strong for stocks that qualify for short-term loss treatment. Further, tax-loss selling is greater for investors who have realized gains during the year and when the overall market has risen during the about-to-end calendar year. The demand for loss offsets is likely to be high in these settings. Third, the authors find that wash sale rules affect trading decisions in December, but they do not find similar evidence for other months. The probability that a stock will be repurchased within 30 days, if sold at a loss in December, is substantially lower than the probability of such a repurchase following sales in other months. This is consistent with wash-sale rules affecting tax-motivated trading. There is no evidence that wash sale rules affect trading behavior in months other than December, or that they distort trading decisions in taxable versus tax-deferred accounts. Finally, using a simulation to test whether following simple tax-avoidance strategies would have significantly boosted investors' aftertax returns, the authors find that simple rules that accelerate the realiza-

tion of tax losses could substantially improve aftertax returns for many investors.

Phased-in tax changes are a common feature of tax legislation. **House** and **Shapiro** use a dynamic general equilibrium model to quantify the effects of delaying tax cuts. According to their analysis, the phased-in tax cuts of the 2001 tax bill substantially reduced employment, output, and investment during the phase-in period relative to alternative policies with immediate, but more modest tax cuts. The rules and accounting procedures used by Congress for formulating tax policy have a significant impact in shaping the details of tax policy and they led to the phase-ins, sunsets, and temporary tax changes in both the 2001 and 2003 tax bills.

**Immervoll, Kleven, Kreiner,** and **Saez** estimate the welfare and distributional impact of two types of welfare reforms in each of the 15 countries in the European Union. The reforms are revenue neutral and financed by an overall and uniform

increase in marginal tax rates on earnings. The first reform distributes the extra taxes evenly to everybody (traditional welfare), while the second reform distributes tax proceeds (uniformly) only to workers (earnings credit). The authors build a simple model of labor supply encompassing responses to taxes and transfers along the intensive and extensive margin. They then use the model to describe current welfare and tax systems in all 15 European countries and use calibrated labor supply elasticities along the intensive and extensive margins to analyze the effects of the two welfare reforms. They precisely quantify the equality-efficiency tradeoff for a range of elasticity parameters. In most countries, because of the large existing welfare programs with high phasing-out rates, the uniform redistribution policy is, in general, undesirable unless the redistributive tastes of the government are extreme. However, redistribution to workers is desirable in a very wide set of cases. The authors discuss the practical policy implications for European

welfare policy.

**Nishiyama** and **Smetters** examine fundamental tax reform in a heterogeneous overlapping-generations (OLG) model in which agents face idiosyncratic earnings shocks and uncertain life spans. Following Auerbach and Kotlikoff (1987), the authors use a Lump-Sum Redistribution Authority to rigorously examine efficiency gains over the transition path. They replace progressive income tax with a flat consumption tax (for example, a value-added tax, or a national retail sales tax). If shocks are insurable (that is, no risk), this reform improves (interim) efficiency, a result consistent with the previous literature. But if, more realistically, shocks are uninsurable, then this reform reduces efficiency, even though national wealth and output increase over the entire transition path. This efficiency loss, in large part, stems from reduced intragenerational risk sharing that was provided by the progressive tax system.

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## Macroeconomics and Individual Decisionmaking

The NBER's Working Group on Macroeconomics and Individual Decisionmaking met in Cambridge on November 1. George A. Akerlof, University of California, Berkeley, and Robert J. Shiller, NBER and Yale University, organized this program:

**James J. Choi**, Harvard University; **David Laibson**, NBER and Harvard University; **Brigitte C. Madrian**, NBER and University of Chicago; and **Andrew Metrick**, NBER and University of Pennsylvania, "Active Decisions: A Natural Experiment in Savings" Discussant: Annamaria Lusardi, Dartmouth College

**Alberto Alesina**, NBER and

Harvard University, and **George-Marios Angeletos**, NBER and MIT, "Fairness and Redistribution: U.S. versus Europe" Discussant: Roland Benabou, NBER and Princeton University

**N. Gregory Mankiw**, Council of Economic Advisers (on leave from NBER and Harvard University); **Ricardo Reis**, Harvard University; and **Justin Wolfers**, NBER and Stanford University, "Disagreement about Inflation Expectations" (NBER Working Paper No. 9796) Discussant: Stephen Cecchetti, NBER and Brandeis University

**Xavier Gabaix**, NBER and MIT, and **David Laibson**, "Industrial

Organization with Boundedly Rational Consumers" Discussant: Barry Nalebuff, Yale University

**Robert S. Chirinko**, Emory University, and **Huntley Schaller**, Carleton University, "Glamour versus Value: The Real Story" Discussant: Jason Cummins, Federal Reserve Board

**Rafael Di Tella**, Harvard University, and **Robert MacCulloch**, Princeton University, "Why Doesn't Capitalism Flow to Poor Countries?" Discussant: Simeon Djankov, World Bank

Decisionmakers overwhelmingly tend to accept default options. In this paper, **Choi** and his co-authors identify an overlooked but practical alternative to defaults. They analyze the experience of a company that required its employees to affirmatively elect to enroll or not enroll in the company's 401(k) plan. Employees were told that they had to actively make a choice, one way or the other, with no default option. This "active decision" regime provides a neutral middle ground that avoids the paternalism of a one-size-fits-all default election. The active decision approach to 401(k) enrollment yields participation rates that are up to 25 percentage points higher than those under a regime with the standard default of non-enrollment. Requiring employees to make an active 401(k) election also raises average saving rates and asset accumulation with no increase in the rate of attrition from the 401(k) plan.

Different beliefs about how fair social competition is and what determines income inequality influence the redistributive policy democratically chosen in a society. But the composition of income depends first on equilibrium tax policies. If a society believes that individual effort determines income, and that all have a right

to enjoy the fruits of their effort, then it will choose low redistribution and low taxes. In equilibrium, effort will be high, the role of luck limited, market outcomes will be quite fair, and social beliefs will be self-fulfilled. If a society instead believes that luck, birth, connections and/or corruption determine wealth, then it will tax a lot, thus distorting allocations and making these beliefs self-sustained as well. **Alesina** and **Angeletos** show how this interaction between social beliefs and welfare policies may lead to multiple equilibriums or multiple steady states. They argue that this model can contribute to explaining U.S. vis-a-vis continental-European perceptions about income inequality and the choices of redistributive policies.

Analyzing 50 years of data on inflation expectations from several sources, **Mankiw**, **Reis**, and **Wolfers** document substantial disagreement among consumers and professional economists about expected future inflation. Moreover, this disagreement varies substantially through time, moving with inflation, the absolute value of the change in inflation, and relative price variability. The authors argue that a satisfactory model of economic dynamics must speak to these important business cycle moments. Noting

that most macroeconomic models do not generate disagreement endogenously, the authors show that a simple "sticky-information" model broadly matches many of these facts. Moreover, the sticky-information model is consistent with other observed departures of inflation expectations from full rationality, including autocorrelated forecast errors and insufficient sensitivity to recent macroeconomic news.

Consumers don't always know the true value of the products they buy. Instead, consumers have only an imperfect signal of value and buy the product with the best signal. **Gabaix** and **Laibson** embed these consumers in a marketplace of perfectly informed, maximizing firms. The authors first analyze a market in which some consumers do not anticipate all of the future consequences of a current purchase. In such circumstances, firms will choose monopoly prices for shrouded add-ons — like rental car gas tank refills — making the shrouded add-on a profit center and the base good a potential loss leader. **Gabaix** and **Laibson** show that such monopoly pricing even will persist in markets with a high degree of competition and free advertising, since firms will choose not to advertise the profitable shrouded attributes. Making the add-



on salient leads consumers to find less expensive substitutes for it. The authors then analyze markets in which consumer signals are noisy estimates of the true utility value of products. In equilibrium, noise effectively increases firms' market power and raises markups. The markup is materially insensitive to the degree of competition. When noise is an endogenous variable, firms choose excess noise by making their products inefficiently complex. Moreover, an increase in competition causes firms to choose even more noise or excess complexity. Finally, Gabaix and Laibson propose an econometric framework that measures the amount of bounded rationality in the marketplace.

**Chirinko** and **Schaller** use cross-sectional variation between glamour (high stock market price) and value (low stock market price) portfolios to address the possible relationship between misvaluation and fixed investment. In a large sample of U.S. firms

over the period 1980-2001, glamour firms invest substantially more than value firms. The difference is roughly the same after controlling for fundamentals. The median glamour firm raises more in new share issues than its total capital expenditures for the year. If glamour firms are responding to misvaluation rather than fundamentals, then they may be investing too much. **Chirinko** and **Schaller** describe and implement four tests designed to distinguish whether the high investment of glamour firms is the result of fundamental shocks or misvaluation shocks: investment reversals, stock market returns of high-investment firms, the path over time of the marginal product of capital, and overreaction tests. The evidence is generally more consistent with misvaluation shocks than fundamental shocks as an explanation for the high investment of glamour firms.

**Di Tella** and **MacCulloch** find evidence that governments in poor

countries have a more left-wing rhetoric than those in OECD countries. One possible explanation for this is that corruption, which is more widespread in poor countries, reduces the electoral appeal of capitalism more than that of socialism. The empirical pattern of beliefs within countries is consistent with this explanation: people who perceive corruption to be high in the country are also more likely to lean left ideologically and to declare to support a more intrusive government in economic matters. Finally, the authors provide a simple model in which it is *assumed* that corruption under capitalism is informative about private sector productivity and honesty levels, whereas corruption under socialism contains less information (simply reveals honesty levels). There is a negative externality, in the sense that the existence of corrupt entrepreneurs hurts good entrepreneurs by reducing the general appeal of capitalism.

## Labor Studies

The NBER's Program on Labor Studies met in Cambridge on November 7. Program Director Richard B. Freeman and Research Associate Lawrence F. Katz, both of Harvard University, organized the meeting. The following papers were discussed:

**Sewin Chan**, New York University, and **Ann Huff Stevens**, NBER and University of California, Davis, "What You Don't Know Can't Help You: Knowledge and Retirement

Decisionmaking"

**Steven J. Haider**, Michigan State University, and **Melvin Stephens Jr.**, NBER and Carnegie Mellon University, "Is There a Retirement-Consumption Puzzle? Evidence Using Subjective Retirement Expectations"

**Gordon Dahl**, NBER and University of Rochester, and **Enrico Moretti**, NBER and University of California, Los

Angeles, "The Demand for Sons: Evidence from Divorce, Fertility, and Unwed Mothers in the U.S. and Around the World"

**Jennifer Hunt**, NBER and University of Montreal, "Trust and Bribery: The Role of Quid Pro Quo and the Link with Crime"

**Justin McCrary**, University of Michigan, "The Effect of Court-Ordered Hiring Quotas on the Composition and Quality of Police"

**Chan** and **Stevens** focus on this puzzle: how can individuals respond to detailed pension information that, apparently, they do not possess? Recent evidence shows that most individuals do not know the details of their employer-provided pension plans. At the same time, virtually all recent studies of retirement timing are based on administrative data of which

individuals themselves may not be aware. Chan and Stevens use individuals' self-reports to construct measures of knowledge about pension plans. They show that individual responsiveness to pension incentives based on employer-reported data vary dramatically with these knowledge measures. Well-informed individuals have an elasticity of retirement with respect to

pension incentives that is three times as large as the average response (which ignores information issues.) In contrast, there is no evidence of a relationship between their pensions and retirement timing among the uninformed. This should encourage researchers to make more use of self-reported data in order to better understand decision-making.

Previous research shows a systematic fall in consumption at retirement, a finding that is inconsistent with the life-cycle/permanent income hypothesis. In their paper, **Haider** and **Stephens** use workers' beliefs about their expected retirement dates as an instrument for retirement. After demonstrating that subjective retirement expectations are strong predictors of subsequent retirement, they still find a systematic fall in consumption for workers who retire when expected. However, the results suggest that this fall in consumption is half as large as that found when the authors rely instead on the instrumental-variables strategy used in prior studies.

In the United States, parental preferences for sons versus daughters may be manifest in a variety of ways, including effects on marital status and fertility behavior. **Dahl** and **Moretti** document that having girls has significant effects on divorce, marriage, shotgun marriage (*when the sex of the child is known before birth*), and fertility-stopping rules. Using a simple model, they show that, taken individually, each piece of evidence does not necessarily imply the existence of parental gender bias. But taken together, the evidence indicates that parents in the United States favor boys over girls. The authors begin by documenting that mothers with girls are significantly more likely to be divorced than mothers with boys. Further, controlling for family size, women with only girls are substantially more likely to have never been married than women with only boys. Mothers who only have daughters and divorce and then remarry are

more likely to get a second divorce. Perhaps the most striking evidence comes from the analysis of shotgun marriages based on Vital Statistics data. Mothers who find out that their child will be a boy are more likely to marry their partner before delivery. Specifically, among those who have an ultrasound test during their pregnancy, mothers carrying a boy are more likely to be married at delivery. In the final part of the paper, the authors extend the analysis to five developing countries. For divorce, the negative effect of an all-daughters family is substantial, twice to eight times as large as in the United States. Comparing the effects on fertility across countries, it is largest for China and Vietnam, with more moderate effects for Mexico, Colombia, and Kenya.

**Hunt** studies data on bribes actually paid by individuals to public officials, viewing the results through a theoretical lens that considers the implications of trust networks. A bond of trust may permit a quid pro quo to substitute for a bribe, which in some situations is more efficient and honest. Hunt shows that in the presence of quid pro quos, the incidence of bribery may be non-monotonic in client income. She finds evidence of this in the International Crime Victim Surveys, as well as evidence that bribery is less frequent in small towns, where the appropriate networks are more easily established. Older people, who have had time to develop a network, bribe less. The low incidence of bribery among the poor presumably implies reduced access to public services, yet city size, age, gender, and car

ownership are more important determinants of bribery than income. Hunt also shows that victims of crimes bribe all types of public officials more than non-victims, and she argues that both their victimization and the bribery stem from a distrustful environment. Hunt finds indirect evidence that criminals are particularly likely to bribe the police and customs. Together, these results suggest that the best start to changing a distrustful environment is combatting corruption in the police and customs.

**McCrary** examines the role of the federal courts in integrating police departments in the United States. Using a new dataset on police force demographic composition, city demographics, and employment discrimination litigation in 314 large U.S. municipalities, he demonstrates that the filing of a class action lawsuit alleging hiring discrimination against African-Americans is associated with a trend break in the share of police department employment of Blacks. He estimates that the 25-year gain in black-employment share in litigated departments is in the range of 8 to 12 percentage points. Given the low attrition rate of police officers, this is consistent with a hiring fraction for African-Americans that is approximately 12 to 19 percentage points above the pre-litigation police department fraction that is Black. Finally, McCrary finds little evidence that litigation led to increased crime, despite large and persistent differences by race in police department entrance examination scores.

## Monetary Economics

The NBER's Program on Monetary Economics met in Cambridge on November 7. Program Co-Directors Christina D. Romer and David H. Romer, both of University of California, Berkeley, organized this agenda:

**James J. Choi**, Harvard University; **David Laibson**, NBER and Harvard University; and **Brigitte C. Madrian** and **Andrew Metrick**, NBER and University of Pennsylvania, "Consumption-Wealth Comovement of the Wrong Sign" Discussant: Matthew D. Shapiro, NBER and University of Michigan

**Michael D. Bordo**, NBER and Rutgers University, and **Joseph G. Haubrich**, Federal Reserve Bank of

Cleveland, "The Yield Curve, Recessions, and the Credibility of the Monetary Regime: Long-run Evidence, 1875-1997" Discussant: James H. Stock, NBER and Harvard University

**Craig Burnside**, University of Virginia, and **Martin Eichenbaum** and **Sergio Rebello**, NBER and Northwestern University, "Government Finance in the Wake of Currency Crises" Discussant: Guy Debelle, MIT

**Jon Faust**, **Eric T. Swanson**, and **Jonathan H. Wright**, Federal Reserve Board, "Do Federal Reserve Policy Surprises Reveal Inside Information About the Economy?"

Discussant: David H. Romer

**Jean Boivin**, NBER and Columbia University, "Has U.S. Monetary Policy Changed? Evidence from Drifting Coefficients and Real-Time Data"

Discussant: Andrew Levin, Federal Reserve Board

**Ignazio Angeloni** and **Benoît Mojon**, European Central Bank; **Anil K Kashyap**, NBER and University of Chicago; and **Daniele Terlizzese**, Banca d'Italia, "The Output Composition Puzzle: A Difference in the Monetary Transmission Mechanism in the Euro Area and U.S."

Discussant: Marc Giannoni, Columbia University

Economic theory predicts that an unexpected windfall in wealth should increase consumption as soon as it is received. **Choi**, **Laibson**, **Madrian**, and **Metrick** test this prediction by using administrative records on over 40,000 401(k) accounts. Contrary to theory, the authors estimate a negative short-run marginal propensity to consume out of orthogonal 401(k) capital gains shocks. Their findings suggest that many investors are influenced by a reinforcement learning heuristic that causes high returns to encourage saving and low returns to discourage saving. These results help explain why consumption covariance with equity returns is so low, giving rise to the equity premium puzzle.

**Bordo** and **Haubrich** show that the stylized fact that the yield curve predicts future growth holds for the past 125 years, and is robust across several specifications. The monetary regime seems important, and in accord with the authors' theory, regimes with low credibility (high persistence) tend to have better predictability. This finding reinforces the notion that the monetary regime is critical in interpreting the yield curve, and that the term structure of interest rates is heavily conditioned on the monetary regime. In particular, it may be quite mislead-

ing to draw general conclusions from data generated in one inflation regime. And, credibility may be a mixed blessing. While a more credible regime usually will mean that monetary policy is less a source of instability for the economy, credibility itself may make policymaking more difficult, because information sources such as the yield curve become less informative. Still, notions such as credibility are often hard to pin down and measure, and these results suggest an additional metric: the predictive content of the yield, which can provide an additional piece of evidence about the credibility of the regime in question.

**Burnside**, **Eichenbaum**, and **Rebello** address two questions: how do governments actually pay for the fiscal costs associated with currency crises; and what are the implications of different financing methods for post-crisis rates of inflation and depreciation? They study these questions using a general equilibrium model in which a currency crisis is triggered by prospective government deficits. They then use the model together with fiscal data to interpret government financing in the wake of three recent currency crises: Korea (1997), Mexico (1994), and Turkey (2001).

A number of recent papers have

hypothesized that the Federal Reserve possesses information about the course of inflation and output that is unknown to the private sector, and that policy actions by the Federal Reserve convey some of this inside information. **Faust**, **Swanson**, and **Wright** conduct two tests of this hypothesis: 1) *could* monetary policy surprises be used to improve the private sector's ex ante forecasts of subsequent macroeconomic statistical releases, and 2) *does* the private sector revise its forecasts of macroeconomic statistical releases in response to these monetary policy surprises? The authors find little evidence that Federal Reserve policy surprises convey inside information about the state of the economy: they could not systematically be used to improve forecasts of statistical releases and the forecasts are not systematically revised in response to policy surprises. One possible exception to this pattern is Industrial Production, a statistic that the Federal Reserve produces.

Despite the amount of empirical research on monetary policy rules, there is surprisingly little consensus on the nature, or even the existence, of changes in the conduct of monetary policy. Three issues appear central to this disagreement: 1) the specific type of changes in the policy coefficients;

2) the treatment of heteroskedasticity; and 3) the real-time nature of the estimation. **Boivin** treats these issues in the context of a forward-looking Taylor rule with drifting coefficients. His estimation is based on real-time data and accounts for the presence of heteroskedasticity in the policy shock. His findings suggest important but gradual changes in the rule coefficients, not captured adequately by the usual split-sample estimation. The Fed's response to inflation appears to have evolved from a weak response in

the mid-1970s, not satisfying Taylor's principle at times, to a stronger response thereafter. Moreover, the Fed's response to real activity fell substantially in the 1970s.

**Angeloni, Kashyap, Mojon, and Terlizzese** revisit recent evidence on how monetary policy affects output and prices in the United States and in the euro area. The responses to a shift in monetary policy are similar in most respects, but differ noticeably as to the composition of output changes. In the euro area, investment is the predomi-

nant driver of output changes, while in the United States consumption shifts are significantly more important. The authors dub this difference "the output composition puzzle" and explore its implications and several potential explanations for it. While the evidence seems to point at differences in consumption responses, rather than investment, as the proximate cause for this fact, the source of the consumption difference remains a puzzle.

## Higher Education

The NBER's Working Group on Higher Education met in Cambridge on November 13. Director Charles T. Clotfelter of Duke University organized the meeting. The following papers were discussed:

**Christopher M. Cornwell, Kyung Hee Lee, and David B. Mustard**, University of Georgia, "The Effects of Merit-Based Financial Aid on Course Enrollment, Withdrawal and Completion in College"  
Discussant: Sarah Turner, NBER and University of Virginia

**Albert J. Sumell and Paula E. Stephan**, Georgia State University, and **James D. Adams**, NBER and

University of Florida, "Capturing Knowledge: The Location Decision of New PhDs Working in Industry"  
Discussant: John de Figueiredo, NBER and MIT

**Thomas J. Kane**, NBER and University of California, Los Angeles, "Evaluating the Impact of the DC Tuition Assistance Grant Program"  
Discussant: Eric Bettinger, NBER and Case Western Reserve University

**Catharine Hill, Gordon Winston, and Stephanie Boyd**, Williams College, "Affordability: Family Incomes and Net Prices at Highly

Selective Private Colleges and Universities"  
Discussant: Ronald G. Ehrenberg, NBER and Cornell University

**Todd R. Stinebrickner**, University of Western Ontario, and **Ralph Stinebrickner**, Berea College, "Credit Constraints and College Attrition"  
Discussant: Christopher Avery, NBER and Harvard University

**David Marmaros**, Google.com, and **Bruce Sacerdote**, NBER and Dartmouth College, "How Friendships Form"  
Discussant: David Zimmerman, NBER and Williams College

Using data from the longitudinal records of all undergraduates who enrolled at the University of Georgia between 1989 and 1997, **Cornwell, Lee, and Mustard** estimate the effects of HOPE scholarships on course enrollment, withdrawal, and completion, and on the diversion of course taking from the academic year to the summer. They find first that HOPE decreases full-load enrollments and increases course withdrawals among resident freshmen. This results in a 12 percent lower probability of full-load completion and an annual average reduction in completed credits of about 0.8 or 2 percent. The latter implies that between 1993 and 1997, Georgia resident freshmen completed

almost 12,600 fewer credit hours than non-residents. Second, the scholarship's influence on course-taking behavior is concentrated on students whose GPAs place them on or below the scholarship-retention margin. Third, the effect of the HOPE program increases with the lifting of the income cap. Fourth, these freshmen credit-hour reductions represent a general slowdown in academic progress and not just intertemporal substitution. Finally, resident students diverted an average of 0.5 credits from the regular academic year to the summer in each of their first two summers after matriculation, which amounts to a 22 percent rise in summer course taking.

**Sumell, Stephan, and Adams**

examine the factors that influence the probability that a newly trained PhD will remain "local" or stay in the state. Specifically, they measure how various individual, institutional, and geographic attributes affect the probability that new PhDs who choose to work in industry will stay in the metropolitan area or state of training. Given that the ability to capture knowledge spillovers arguably decreases as distance increases, the authors also examine the distance that new PhDs move to take an industrial position. They focus on PhDs who received their degree in one of twelve fields of science and engineering during the period 1997-9. Data for the study come from the Survey of Earned Doctorates, administered by

Science Resources Statistics, National Science Foundation. The authors find that state and local areas do capture knowledge embodied in newly minted PhDs headed to industry, but not at an overwhelming rate. Certain states and metropolitan areas have an especially high attrition rate. Moreover, the related universities are not new but have a long history of producing scientists and engineers. This suggests that training local talent is far from sufficient in fostering an economic environment that encourages retention. The authors also find that retention is related to a number of personal characteristics such as marital status, age, level of debt, previous work experience, and visa status. Retention is also related to the local technological infrastructure.

With the creation of the D.C. Tuition Assistance Grant Program (DC TAG) in the fall of 2000, the menu of college prices offered to residents of the District of Columbia changed dramatically. D.C. residents were offered the opportunity to attend public institutions elsewhere in the country, and to receive a grant to cover the difference between in-state and out-of-state tuition, up to \$10,000. (The program also offered smaller grants to those attending private colleges in the D.C. area and private, historically black institutions elsewhere.) According to **Kane**, the program led to large increases in enrollment of D.C. residents at public institutions around the country, particularly at non-selective, four-year, predominantly black institutions in the mid-Atlantic states. The number of D.C. residents enrolling in college also increased by 16 to 20 percent. Moreover, although

the program was not means-tested, there were small differences in reciprocity rates between middle and high income neighborhoods.

Working from the financial aid records of individual students at 28 highly selective private colleges and universities (the COFHE schools), **Hill, Winston, and Boyd** address two questions: what do the highly able low income students at these schools actually pay, net of financial aid grants, for a year's education; and how do these schools differentiate their prices in recognition of the different family incomes of their students — the concrete evidence of their dedication to equality of opportunity? While there is considerable variety in net prices, it turns out that many of these schools charge their low income students very little (one, less than \$800 a year for the average student in the bottom income quintile), making it quite reasonable for a highly able student to aspire to go to a very selective private college or university regardless of family income. There is considerable variety among schools, though. Virtually all of them charge students in the bottom income quintile a lower net price, on average, than they do their wealthier students, but at some, the net price as a share of family income rises as incomes increase while at others it falls. Most, however, follow pricing policies that embody rough proportionality between net price and family income over the whole range of the student incomes, including those paying the full sticker price. The net prices that remain to be paid by aided students are covered, of course, by direct payment and “self-help” — by loans and student jobs. In

the data, the error in the popular representation of tuition and income is clear: the average sticker price is 66 percent of median U.S. family income, but the average student at that level pays just 23 percent of family income.

**Stinebrickner and Stinebrickner** examine the effect of credit constraints on college attrition using unique data from the Berea Panel Study. They find that, while short-run liquidity constraints are likely to play an important role in the outcomes of some students, the percentage of attrition that is caused by these constraints is small.

**Marmaros and Sacerdote** examine how people form social networks among their peers. They use a unique dataset on the volume of email between any two people — in this case, some students and recent graduates of Dartmouth College. Their main finding is that geographic proximity and race are far more important determinants of friendship than are common interests or common majors. The effects of race are quite large; for example, two randomly chosen black students are seven times more likely to interact than are a black student and a white student. Nonetheless, there still remain substantial amounts of interracial interaction, in part because of the powerful effects of distance coupled with randomized freshman housing. Women are more likely to interact with other women. But conditional on there being *any* communication between a given woman and man, the volume of communication between them is large. The results show that even short-run residential mixing among people of different backgrounds promotes long-run social interaction among those people.

## Asset Pricing

The NBER's Program on Asset Pricing met in Cambridge on November 14. Program Director John H. Cochrane, University of Chicago, and Tobias J. Moskowitz, NBER and Northwestern University, organized this program:

**Lubos Pástor** and **Pietro Veronesi**, NBER and University of Chicago, "Stock Prices and IPO Waves"  
Discussant: Deborah J. Lucas, NBER and Northwestern University

**Anna Pavlova**, MIT, and **Roberto Rogobon**, NBER and MIT, "Asset Prices and Exchange Rates"  
Discussant: Pedro Santa-Clara,

University of California, Los Angeles

**Bryan R. Routledge**, Carnegie Mellon University, and **Stanley E. Zin**, NBER and Carnegie Mellon University, "Generalized Disappointment Aversion and Asset Prices"  
Discussant: Thomas Knox, University of Chicago

**Robert J. Hodrick** and **Andrew Ang**, NBER and Columbia University, **Yuhang Xing**, Rice University; and **Xiaoyan Zhang**, Cornell University, "The Cross-Section of Volatility and Expected

Returns"  
Discussant: Jun Pan, MIT

**Michael W. Brandt**, Duke University, and **Alessandro Beber**, University of Lausanne, "The Effect of Macroeconomic News on Beliefs and Preferences: Evidence from the Options Market"  
Discussant: Andrew W. Lo, NBER and MIT

**Wei Xiong** and **Jose Scheinkman**, Princeton University, and **Harrison Hong**, Stanford University, "Asset Float and Speculative Bubbles"  
Discussant: Lasse Pedersen, New York University

**Pástor** and **Veronesi** explore why IPO volume changes over time and how it relates to stock prices. They develop a model of optimal IPO timing in which IPO volume fluctuates because of time variation in market conditions. IPO waves are caused by declines in expected market return, increases in expected aggregate profitability, or increases in prior uncertainty about the average future profitability of IPOs. The model makes numerous predictions for IPO volume, for example that IPO waves are preceded by high market returns and followed by low market returns. The data support these and other predictions.

**Pavlova** and **Rigobon** develop a simple two-country, two-good model in which the real exchange rate and prices of stocks and bonds are determined jointly. The model predicts that stock market prices are correlated internationally, even though their dividend processes are independent. This provides a theoretical argument in favor of financial contagion. The foreign exchange market serves as a propagation channel from one stock market to the other. The model identifies interconnections among stock, bond, and foreign exchange markets and characterizes their joint dynamics as a three-factor model. Contemporaneous responses of each market to changes in the factors have unambiguous signs.

Most of the signs predicted by the model indeed obtain in the data, and the point estimates are in line with the implications of the theory. Moreover, the factors extracted from daily data on stock indexes and exchange rates explain a sizable fraction of the variation in a number of macroeconomic variables, and the estimated signs on the factors are consistent with the model's implications. The authors also derive agents' portfolio holdings and identify economic environments under which they exhibit a home bias. Finally, they show that an international CAPM obtained in their model has two additional factors.

**Routledge** and **Zin** provide an axiomatic model of preferences over atemporal risks that generalizes Gul's disappointment-aversion model by allowing risk aversion to be "first order" at locations in the state space that do not correspond to certainty. Since the lotteries being valued by an agent in an asset-pricing context are not typically local to certainty, the authors' generalization, when embedded in a dynamic recursive utility model, has important quantitative implications for financial markets. They show that the state-price process, or asset-pricing kernel, in a Lucas-tree economy in which the representative agent has generalized disappointment aversion preferences is consistent with

the pricing kernel that resolves the equity-premium puzzle. They also demonstrate that a small amount of conditional heteroskedasticity in the endowment-growth process is necessary to generate these favorable results. In addition, they show that risk aversion can be both state-dependent and counter-cyclical, which empirical research has demonstrated is necessary for explaining observed asset-pricing behavior.

**Ang, Hodrick, Xing** and **Zhang**, examine how volatility risk, both at the aggregate market and the individual stock level, is priced in the cross-section of expected stock returns. Stocks that have high sensitivities to innovations in aggregate volatility have low average returns, and a cross-sectional factor capturing systematic volatility risk earns -0.87 percent per month. The authors find that stocks with high idiosyncratic volatility have abysmally low returns. The quintile portfolio composed of stocks with the highest idiosyncratic volatilities does not even earn an average positive total return. The low returns earned by stocks with high exposure to systematic volatility risk, and the low returns of stocks with high idiosyncratic volatility, are not priced by the standard size, value, or momentum factors, and are not subsumed by liquidity or volume effects.

**Beber** and **Brandt** examine the effect of regularly scheduled macroeco-

economic announcements on the beliefs and preferences of participants in the U.S. Treasury market by comparing the option-implied state-price density (SPD) of bond prices shortly before and after the announcements. They find that the announcements reduce the uncertainty implicit in the second moment of the SPD, regardless of the content of the news. The changes in the higher-order moments, in contrast, depend on whether the news is good or bad for economic prospects. Using a standard model for interest rates to disentangle changes in beliefs and changes

in preferences, the authors demonstrate that their results are consistent with time-varying risk aversion in the spirit of habit formation.

**Hong, Scheinkman, and Xiong** model the relationship between float (the tradeable shares of an asset) and stock price bubbles. Investors trade a stock that initially has a limited float because of insider lock-up restrictions but whose tradeable shares increase over time as these restrictions expire. A speculative bubble arises because investors, with heterogeneous beliefs caused by overconfidence and facing

short-sales constraints, anticipate the option to resell the stock to buyers with even higher valuations. With limited risk absorption capacity, this resale option depends on float, as investors anticipate the change in asset supply over time and speculate over the degree of insider selling. The model yields implications consistent with the behavior of internet stock prices during the late 1990s, such as the bubble, share turnover, and volatility decreasing with float and stock prices tending to drop on the lock-up expiration date, although it is known to all in advance.

## Corporate Finance

The NBER's Program on Corporate Finance met in Cambridge on November 14. Organizers Florencio Lopez de Silanes, NBER and Yale University, and Rafael La Porta, NBER and Harvard University, chose these papers to discuss:

**Patrick Bolton**, NBER and Princeton University, and **Jose Scheinkman** and **Wei Xiong**, Princeton University, "Executive Compensation and Short-Term Behavior in Speculative Markets" (NBER Working Paper No. 9722) Discussant: Sendhil Mullainathan, NBER and MIT

**Mihir A. Desai**, NBER and Harvard University; **C. Fritz Foley**, University of Michigan; and **James R. Hines, Jr.**, NBER and University of Michigan, "A Multinational

Perspective on Capital Structure Choice and Internal Capital Markets" (NBER Working Paper No. 9715) Discussant: Owen Lamont, NBER and Yale University

**Eugene F. Fama**, University of Chicago, and **Kenneth R. French**, NBER and Dartmouth College, "Financing Decisions: Who Issues Stocks?" Discussant: Stewart C. Myers, NBER and MIT

**Francisco Pérez-González**, Columbia University, "The Impact of Acquiring Control on Productivity: Evidence from Mexican Manufacturing Plants" Discussant: Luigi Zingales, NBER and University of Chicago

**Lucian Bebchuk**, NBER and Harvard University, "Asymmetric Information and the Choice of Corporate Governance Arrangements" Discussant: Nittai Bergman, MIT

**Marianne Bertrand**, NBER and University of Chicago; **Antoinette Schoar**, NBER and MIT; and **David Thesmar**, ENSAE, "Banking Deregulation and Industry Structure: Evidence from the French Banking Reforms of 1985" Discussant: Paola Sapienza, Northwestern University

**Daron Acemoglu** and **Simon Johnson**, NBER and MIT, "Unbundling Institutions" (NBER Working Paper No. 9934) Discussant: Andrei Shleifer, NBER and Harvard University

**Bolton, Scheinkman, and Xiong** present a multiperiod agency model of stock-based executive compensation in a speculative stock market, where investors are overconfident and stock prices may deviate from underlying fundamentals and include a speculative option component. This component arises from the option to sell the stock in the future to potentially over-optimistic investors. The authors show that optimal compensation contracts

may emphasize short-term stock performance, at the expense of long-run fundamental value, as an incentive to induce managers to pursue actions that increase the speculative component in the stock price. This model provides a different perspective for the recent corporate crisis than the increasingly popular "rent extraction view" of executive compensation.

**Desai, Foley, and Hines** analyze the capital structures of foreign affili-

ates and internal capital markets of multinational corporations. Ten percent higher local tax rates are associated with 2.8 percent higher debt/asset ratios, with internal borrowing particularly sensitive to taxes. Multinational affiliates are financed with less external debt in countries with underdeveloped capital markets or weak creditor rights, reflecting significantly higher local borrowing costs. Instrumental variable analysis indicates that greater borrow-

ing from parent companies substitutes for three-quarters of reduced external borrowing induced by capital market conditions. Multinational firms appear to employ internal capital markets opportunistically to overcome imperfections in external capital markets.

Financing decisions seem to violate the pecking order's central predictions about how often and under what circumstances firms issue equity. Specifically, most firms issue or retire equity each year, the issues on average are large, and they are not typically done by firms under duress. **Fama and French** estimate that during 1973-2001 the year-by-year equity decisions of more than half of their sample firms contradict the pecking order. And, contradictions are more common among larger firms.

**Pérez-González** investigates the importance of corporate "control" on the performance of foreign affiliates of multinational corporations (MNCs). Using detailed micro-level information from Mexico, he shows that manufacturing plants in which MNCs acquire majority ownership ("control") became more productive. To explore whether this link is causal, he uses the elimination of foreign majority ownership restrictions to study the performance of plants whose MNC ownership increased from minority to majority as a result. He finds that acquiring control is associated with large improvements in total factor productivity, and that enhanced performance is concentrated in industries that rely on technological innovations from their parent companies. He interprets the evidence as supportive of the property rights theory of the firm.

**Bebchuk** analyzes how asymmetric information affects which corporate governance arrangements firms choose — through the design of securities and corporate charters — when

they go public. He shows that such asymmetry might lead firms to adopt corporate governance arrangements that are commonly known to be inefficient by both public investors and those taking firms public. When higher asset value is correlated with higher private benefits of control, asymmetric information about the asset value of firms going public will lead some or all such firms to offer a sub-optimal level of investor protection. The results may help to explain why charter provisions cannot be relied on to provide optimal investor protection in countries with poor investor protection; why companies going public in the United States commonly include substantial anti-takeover provisions in their charters; and why companies rarely restrict self-dealing or the taking of corporate opportunities more than is done by the corporate laws of their country.

**Bertrand, Schoar, and Thesmar** investigate the effects of banking deregulation on firms' behavior, exit and entry decisions, and overall product market structure in the non-financial sectors. The authors use the deregulation of the French banking industry in 1985 as an economy-wide shock to the banking sector that affected all industries, but in particular those that relied most heavily on external finance and bank loans. The deregulation eliminated government interference in lending decisions, allowed French banks to compete more freely against each other in the credit market, and did away with implicit and explicit government subsidies for most bank loans. After deregulation, banks seem to tie their lending decisions more closely to firm performance. Low quality firms that suffer negative shocks do not receive large increases in bank credit anymore. Instead, these firms display a much higher propensity to undertake restructuring measures post-reform,

for example, to reduce wages and out-source production. The authors also observe a strong increase in performance mean reversion after 1985, especially for firms that were hit by negative shocks. All of these results are particularly strong for firms in more bank-dependent industries. On the product-market side, there is a strong increase in asset reallocation in more bank-dependent industries, mostly coming from higher entry and exit rates in these sectors. There is also an increase in allocative efficiency across firms in these sectors, as well as a decline in concentration ratios.

**Acemoglu and Johnson** evaluate the importance of "property rights institutions," which protect citizens against expropriation by the government and powerful elites, and "contracting institutions," which enable private contracts between citizens. They exploit exogenous variation in both types of institutions driven by colonial history, and document strong first-stage relationships between property rights institutions and the determinants of European colonization strategy (settler mortality and population density before colonization), and between contracting institutions and the identity of the colonizing power. Using this approach, the authors find that property rights institutions have a first-order effect on long-run economic growth, investment, and financial development. Contracting institutions appear to matter only for the form of financial intermediation. A possible explanation for this pattern is that individuals often find ways of altering the terms of their formal and informal contracts to avoid the adverse effects of contracting institutions, but are unable to do so against the risk of expropriation.



## Education Program

The NBER's Program on Education met in Cambridge on November 14. Program Director Caroline M. Hoxby of Harvard University organized the meeting. These papers were discussed:

**Michael Kremer**, NBER and Harvard University; **Edward Miguel**, NBER and University of California, Berkeley; and **Rebecca Thornton**, Harvard University, "Incentives to Learn"

**Richard Murnane**, NBER and

Harvard University, and **Claudia Uribe** and **John Willett**, Harvard University, "Why do Students Learn More in Some Classrooms Than in Others? Evidence from Bogota"

**Weili Ding**, University of Michigan, and **Steven F. Lehrer**, University of Pennsylvania, "Estimating Dynamic Treatment Effects from Project STAR"

**Patrick Bayer**, Yale University; **Fernando Ferreira**, University of California, Berkeley; and **Robert**

**McMillan**, University of Toronto, "A Unified Framework for Measuring Preferences for Schools and Neighborhoods"

**Charles T. Clotfelter**, NBER and Duke University, and **Helen F. Ladd** and **Jacob L. Vigdor**, Duke University, "Racial Segregation in Modern-Day Public Schools"

**David N. Figlio**, NBER and University of Florida, "Names, Expectations, and Black Children's Achievement"

**Kremer, Miguel, and Thornton** examine the impact of a merit scholarship program for adolescent girls in Kenya in the context of a randomized evaluation. Girls in program schools were informed that if they scored well on a later academic exam their school fees would be paid and they would receive a large cash grant for the next two years. Girls eligible for the scholarship showed large gains in academic exam scores (average gain 0.2-0.3 standard deviations), and these gains persisted into the year following the competition. There is also evidence of positive externalities: girls with low baseline test scores (with less chance at the award) and boys (who were ineligible) showed sizeable test gains. Both student and teacher absenteeism fell in the scholarship schools, but there is no evidence of changes in students' self-perceptions or attitudes toward school.

Many studies have documented that children in some classrooms learn considerably more than children who spend the year in other classrooms at the same grade level. It has proven difficult, however, to determine the extent to which differences in student achievement across classrooms stem from differences in the quality of teachers, the quality of peer groups, class sizes, and governance structures (public versus private). Using a unique dataset providing longitudinal achievement data for a large sample of students who attended public or private elementary schools in Bogota,

Colombia, **Uribe, Murnane, and Willett** examine the roles of teacher quality, class size, peer groups, and governance structure in predicting why, net of family background and prior achievement, the average achievement of children in some classrooms is much higher than that of children in other classrooms.

**Ding and Lehrer** consider the analysis of data from randomized trials which offer a sequence of interventions and suffer from a variety of problems in implementation. Their context is Tennessee's highly influential randomized class size study, Project STAR. The authors demonstrate how a researcher can estimate the full sequence of dynamic treatment effects using a sequential difference-in-difference strategy that accounts for attrition attributable to observables using inverse probability weighting M-estimators. These estimates allow them to recover the structural parameters of the small class effects in the underlying education production function and to construct dynamic average treatment effects. They present a complete and different picture of the effectiveness of reduced class size and find that accounting for both attrition caused by observables and selection caused by unobservables is crucial and necessary with data from Project STAR.

**Bayer, Ferreira, and McMillan** set out a framework for estimating household preferences over a broad

range of housing and neighborhood characteristics, some of which are determined by the way that households sort in the housing market. This framework brings together the treatment of heterogeneity and selection that has been the focus of the traditional discrete choice literature, with a clear strategy for dealing with the correlation of unobserved neighborhood quality with both school quality and neighborhood sociodemographics. The authors estimate the model using rich data on a large metropolitan area, drawn from a restricted version of the Census. The estimates indicate that, on average, households are willing to pay an additional one percent in house prices — substantially lower than in prior work — when the average performance of the local school is 5 percent higher. Also, the full capitalization of school quality into housing prices is typically 70-75 percent greater than the direct effect. This is because a social multiplier, neglected in the prior literature, suggests that increases in school quality also raise prices by attracting households with more education and income to the corresponding neighborhood.

In much of the United States, school segregation is increasing even as residential segregation declines. **Clotfelter, Ladd, and Vigdor** present a model in which a school or district administrator actively manages the degree of interracial contact in public schools in order to accommodate the competing desires of stakeholders

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such as parents, teachers, and courts. The authors test the central implications of this model using data on the racial composition of every classroom in the state of North Carolina in the 2000-2001 school year. The results suggest that administrators act differently when deciding on policies influencing segregation between schools and within schools, consistent with the fact that judicial regulation usually applies only to racial balance between schools.

The Black-White test score gap widens considerably over the course of

a child's school career. **Figlio** suggests that one explanation for this phenomenon may involve teachers' expectations of Black children. If teachers have lower expectations for Black children with racially-identifiable names, the grading standards literature suggests that these children will learn less, even when staying in school longer than Black children with more homogenized names. He uses unique data from a large Florida school district to study this issue. Comparing Black siblings, one with a racially identifiable name and the other with a more

homogenized name, he finds that teachers apparently expect less from Black children with racially identifiable names. Further, these lower expectations apparently lead to lower standardized test scores, but not to fewer years of schooling attained. The results are robust to a variety of specification checks concerning the veracity of using sibling comparisons for identification. Figlio finds that the results are stronger for boys than for girls, and are stronger in schools where Black students are in the minority or where Black teachers are uncommon.

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## Behavioral Finance

The NBER's Working Group on Behavioral Finance met in Cambridge on November 15. Group Directors Robert J. Shiller, NBER and Yale University, and Richard H. Thaler, NBER and University of Chicago, organized this program:

**John Y. Campbell** and **Tuomo Vuolteenaho**, NBER and Harvard University, and **Christopher Polk**, Northwestern University, "Growth or Glamour"  
Discussant: Kent D. Daniel, NBER and Northwestern University

**Josef Lakonishok**, NBER and University of Illinois; **Inmoo Lee**, Korea University; and **Allen M.**

**Poteshman**, University of Illinois, "Option Market Activity and Behavioral Finance"  
Discussant: Nicholas C. Barberis, NBER and University of Chicago

**Malcolm Baker**, NBER and Harvard University, and **Jeffrey Wurgler**, NBER and New York University, "Investor Sentiment and the Cross-Section of Stock Returns"  
Discussant: Owen Lamont, NBER and Yale University

**Stefano Della Vigna**, University of California, Berkeley, and **Joshua Pollet**, Harvard University, "Attention, Demographics, and the Stock Market"

Discussant: Zhiwu Chen, Yale University

**Ulrike Malmendier** and **Devin Shanthikumar**, Stanford University, "Are Small Investors Naïve?"  
Discussant: Charles Lee, Cornell University

**Alon Brav** and **John R. Graham**, Duke University; **Campbell R. Harvey**, NBER and Duke University; and **Roni Michaely**, Cornell University, "Payout Policy in the 21<sup>st</sup> Century" (NBER Working Paper No. 9657)  
Discussant: Jeremy C. Stein, NBER and Harvard University

**Campbell, Polk, and Vuolteenaho** show that growth stocks' cash flows are particularly sensitive to temporary movements in aggregate stock prices (driven by movements in the equity risk premium), while value stocks' cash flows are particularly sensitive to permanent movements in aggregate stock prices (driven by market-wide shocks to cash flows.) Thus the high betas of growth stocks with the market's discount-rate shocks, and of value stocks with the market's cash-flow shocks, are determined by the cash-flow fundamentals of growth and value companies. Growth stocks are not merely "glamour stocks" whose systematic risks are driven purely by investor sentiment.

**Lakonishok, Lee, and Poteshman** investigate the behavior of investors in the equity option market using a unique and detailed dataset of open interest and volume for all contracts listed on the Chicago Board Options Exchange over the 1990 through 2001 period. They find that for both calls and puts the short open interest of non-market maker investors is substantially larger than the long open interest. They also find that all types of non-market maker investors display trend-chasing behavior in their option market activity. In addition, they show that the least sophisticated group of investors substantially increased their purchases of

calls on growth stocks during the stock market bubble of the late 1990s and early 2000 while none of the investor groups significantly increased their purchases of puts during the bubble in order to overcome short sales constraints in the stock market. A number of these findings are consistent with option market investors being loss averse, framing over narrow segments of their portfolios, and attempting to avoid financial decisions that they will later regret.

**Baker and Wurgler** examine how investor sentiment affects the cross-section of stock returns. Theory predicts that a broad wave of sentiment will disproportionately affect stocks whose valuations are highly subjective and are difficult to arbitrage. The authors test this prediction by studying how the cross-section of subsequent stock returns varies with proxies for beginning-of-period investor sentiment. When sentiment is low, subsequent returns are relatively high on smaller stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme-growth stocks, and distressed stocks, consistent with an initial underpricing of these stocks. When sentiment is high, on the other hand, these patterns attenuate or fully reverse. These results are consistent with the theory and are unlikely to

reflect an alternative explanation based on compensation for systematic risks.

Do investors pay attention to long-term fundamentals? **Della Vigna** and **Pollet** consider the case of demographic information. Large cohorts, such as the baby boom, generate forecastable positive demand changes over time to the toys, bicycle, beer, life insurance, and nursing home sectors, to name a few. These demand changes are predictable once a specific cohort is born. In this paper, the authors use lagged consumption and demographic data to forecast future consumption demand growth induced by changes in age structure. They find that these demand forecasts predict profitability by industry. Moreover, forecasted demand growth 5 to 10 years into the future predicts one-year returns by industry. An additional one percentage point of annualized demand growth attributable to demographics induces a 4 to 6 percentage point increase in annual abnormal industry stock returns. The forecastability is stronger for concentrated industries and for the more recent time period. Forecasted consumption growth 0 to 5 years into the future, on the other hand, does not predict stock returns. The results are consistent with short-sightedness with respect to long-run information.

Traditional economic analysis of

markets with asymmetric information assumes that the uninformed agents account for the incentives of the informed agents to distort information. **Malmendier** and **Shanthikumar** analyze whether investors in the stock market are able to account for such incentives. Security analysts provide investors with information about investment opportunities by issuing buy and sell recommendations. The recommendations are likely to be biased upwards, in particular if an analyst is affiliated with an investment bank that is a recent underwriter of the recommended firm. Using the trading data from the New York Stock Exchange Trades and Quotations database (TAQ), the authors find that large (institutional) investors generate abnormal volumes of buyer-initiated trades after a positive recommendation only if the analyst is unaffiliated. Small traders exert abnormal buy pressure after all positive recommendations, including those of affiliated analysts. The trading behavior of small analysts

implies losses, since stocks recommended by affiliated analysts perform significantly worse than those recommended by unaffiliated analysts. These results imply that larger investors account for the distortions of recommendations, but small (individual) investors do not. Increased competition among analysts does not remedy the informational distortion or investor reactions.

**Brav, Graham, and Michaely** survey 384 CFOs and treasurers, and conduct in-depth interviews with an additional two dozen, to determine the key factors that drive dividend and share repurchase policies. The authors find that managers are very reluctant to cut dividends, that dividends are smoothed through time, and that dividend increases are tied to long-run sustainable earnings but much less so than in the past. Rather than increasing dividends, many firms now use repurchases as an alternative. Managers view paying out with repurchases as more flexible than using dividends, permit-

ting a better opportunity to optimize investment. Managers like to repurchase shares when they feel their stock is undervalued and in an effort to affect EPS. Dividend increases and the level of share repurchases generally are paid out of residual cash flow, after investment and liquidity needs are met. Financial executives believe that retail investors have a strong preference for dividends, in spite of the tax disadvantage relative to repurchases. In contrast, executives believe that institutional investors as a class have no strong preference between dividends and repurchases. In general, management views provide at most moderate support for agency, signaling, and clientele hypotheses of payout policy. Tax considerations play only a secondary role. By highlighting where the theory and practice of corporate payout policy are consistent and where they are not, the authors attempt to shed new light on important unresolved issues related to payout policy in the 21<sup>st</sup> century.

## Productivity Program Meeting

The NBER's Program on Productivity and Technological Change met in Cambridge on December 5. Aviv Nevo, NBER and University of California, Berkeley, organized this program:

**Johannes Van Biesebroeck**, NBER and University of Toronto, "Revisiting Some Productivity Debates" (NBER Working Paper No. 10065)  
Discussant: James A. Levinsohn, NBER and University of Michigan

**Catherine Wolfram**, NBER and University of California, Berkeley;

**Kira Markiewicz**, University of California, Berkeley; and **Nancy L. Rose**, NBER and MIT, "Has Restructuring Improved Operating Efficiency at U. S. Electricity Generating Plants?"  
Discussant: Mark J. Roberts, NBER and Pennsylvania State University

**Patrick Bajari**, NBER and Duke University; **C. Lanier Benkart**, NBER and Stanford University; and **John Krainer**, Federal Reserve Bank of San Francisco, "Home Prices and Consumer Welfare"  
Discussant: Timothy Erickson, Bureau of Labor Statistics

**Amil Petrin**, NBER and University of Chicago, and **James A. Levinsohn**, "On the Micro Foundations of Productivity Growth"  
Discussant: John C. Haltiwanger, NBER and University of Maryland

**Chad Syverson**, NBER and University of Chicago; **Lucia S. Foster**, Census Bureau; and **John Haltiwanger**, "Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?"  
Discussant: James Tybout, NBER and Pennsylvania State University

**Van Biesebroeck** compares five widely used techniques for estimating productivity: index numbers; data envelopment analysis; and three parametric methods — instrumental variables estimation, stochastic frontiers,

and semi-parametric estimation. He compares them both directly and in terms of three productivity debates using a panel of manufacturing plants in Colombia. The different methods generate surprisingly similar results.

Correlations between alternative productivity estimates invariably are high. All methods confirm that exporters are more productive than others on average and that only a small portion of the productivity advantage is attrib-

utable to scale economies. Productivity growth is correlated more strongly with export status, frequent investments in capital equipment, and employment of managers than with the use of imported inputs or foreign ownership. On the debate as to whether aggregate productivity growth is driven by plant-level changes or output share relocation, all methods point to the importance of plant-level changes, in contrast to results from the United States.

**Wolfram** and her co-authors assess whether an impending restructuring of the electricity industry in the home state of an investor-owned utility encourages that utility to improve efficiency at its generating plants. Under cost-plus regulation, utilities have little incentive to reduce operating costs since they can pass them directly to ratepayers. Restructuring programs increase utilities' exposure to competitive markets for wholesale electricity and ultimately, to competition for their retail customers. Many restructuring programs have been preceded or accompanied by transitional rate freezes, essentially placing the utility under price cap regulation. The authors test the impact of these changes on the operating efficiency of electric generating plants. Using annual plant-level data, they compare changes in non-fuel operating expenses and the number of employees in states that moved quickly to deregulate wholesale markets to those in states that have not pursued restructuring. Their results suggest that utilities in states

enacting restructuring may have reduced nonfuel operating expenses; evidence on employment is mixed. Production function estimates suggest no significant changes in fuel efficiency, and provide mixed evidence of changes in the efficiency of labor and maintenance activity.

**Bajari, Benkard, and Krainer** develop a new approach to measuring changes in consumer welfare attributable to changes in the price of owner-occupied housing. They define an agent's welfare adjustment as the transfer required to keep expected discounted utility constant given a change in current home prices. The authors demonstrate that, up to a first-order approximation, price increases in the existing housing stock cause no aggregate change in welfare. This follows from a simple market-clearing condition: capital gains experienced by sellers are exactly offset by welfare losses to buyers. Welfare losses can occur, however, from price increases in new construction and renovations. The authors show that this result holds (approximately) even in a model that accounts for changes in consumption and investment plans prompted by current price changes. They estimate the welfare cost of house price appreciation to be an average of \$127 per household per year over the 1984-98 period.

**Levinsohn and Petrin** show that the traditional approach to aggregating plant-level productivity has no well-defined unit of measurement. They propose a simple measure that has a readily interpreted economic magni-

tude. They then describe conditions that must be satisfied by a decomposition of plant-level productivity growth in order to separately identify rationalization effects from real productivity effects. The authors show that the seemingly innocuous choice of a decomposition actually can *reverse* the economic conclusions one draws. They provide new suggestions for exploring micro-foundations that are complementary to the usual decompositions, and that can be particularly useful when these decompositions fail. Finally, they use recent Chilean data spanning 10 years (1987-96) to illustrate their concerns.

Is selection driven by efficiency or market power differences? **Foster, Haltiwanger, and Syverson** investigate the nature of selection using data from industries in which they observe both establishment-level quantities *and* prices. They find, as has been shown in the earlier literature for revenue-based TFP measures, that physical productivity and prices also exhibit considerable within-industry variation. They also show that while physical productivity shares common traits with revenue-based measures, there are important differences. These involve the productivity levels of entrants relative to incumbents and the size of the impact of net entry on productivity aggregates. Furthermore, the authors characterize the dimension(s) of selection and show that both idiosyncratic productivity and demand (price) conditions affect businesses' survival probabilities.

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## International Trade and Investment

The NBER's Program on International Trade and Investment met at the Bureau's California office on December 5. ITI Program Director Robert C. Feenstra, also of University of California, Davis, organized this program:

**James Anderson**, NBER and Boston College, and **Eric Van Wincoop**, NBER and University of Virginia, "Trade Costs"

**Christian Broda**, Federal Reserve Bank of New York, and **David E. Weinstein**, NBER and Columbia University, "Globalization and the Gains from Variety"

**Volker Nocke**, University of Pennsylvania, and **Stephen R. Yeaple**, NBER and University of Pennsylvania, "Mergers and the Composition of International Commerce"

**Devashish Mitra**, NBER and Syracuse University, and **Vitor Trindade**, Syracuse University, "Inequality and Trade"

**Eckhard Janeba**, NBER and University of Colorado, Boulder, "International Trade and Cultural Identity"

**Fabio Ghironi**, Boston College, and **Marc J. Melitz**, NBER and Harvard University, "International Trade and Macroeconomic Dynamics with Heterogeneous Firms"

**Paul Bergin** and **Alan M. Taylor**, NBER and University of California, Davis; and **Reuven Glick**, Federal Reserve Bank of San Francisco, "Productivity, Tradability, and The Great Divergence"

**Wolfgang Keller**, NBER and University of Texas, and **Carol H. Shiue**, University of Texas, "The Origins of Spatial Interaction" (NBER Working Paper No. 10069)

**Anderson** and **Van Wincoop** survey trade costs — what we know about them, and what we don't know but may attempt to find out. Partial and incomplete data on direct measures of costs go together with inference on implicit costs from the pattern of trade across countries. Representative margins for full trade costs in rich countries exceed 170 percent. Poor countries face even higher trade costs. There is a lot of variation across countries and across goods within countries, much of which makes economic sense.

**Broda** and **Weinstein** show that the unmeasured growth in product variety from U.S. imports has been an important source of gains from trade over the last three decades (1972-2001). Using extremely disaggregated data, the authors show that the number of imported product varieties has increased by a factor of four. They also estimate the elasticities of substitution for each available category at the same level of aggregation, and describe their behavior across time and SITC-5 industries. Using these estimates, the authors develop an exact price index and find that the upward bias in the conventional import price index is approximately 1.2 percent per year — double the estimated impact attributable to hedonic adjustments on the CPI. The magnitude of this bias suggests

that the welfare gains from variety growth in imports alone are 2.8 percent of GDP per year.

**Nocke** and **Yeaple** provide the first theory that conceptually distinguishes between the two modes in which firms can engage in Foreign Direct Investment (FDI): greenfield investment and cross-border mergers & acquisitions (M&A). In this model, firms differ in their productive capabilities, which can be decomposed into two complementary sets: mobile capabilities that can be transferred abroad, and immobile capabilities that cannot. In contrast to greenfield FDI, cross-border mergers allow a firm access to a foreign firm's country-specific capabilities, and result in the greatest degree of integration into the foreign market. The authors study how firms with different capabilities select different modes of foreign market access: cross-border M&A, greenfield FDI, and exports. The degree to which firms differ in their mobile and immobile capabilities plays a crucial role for the composition of international commerce: depending on whether firms differ in the mobile or immobile capabilities, cross-border mergers may involve the most or the least productive firms. A similar dichotomy obtains when analyzing the effects of country and industry characteristics on the average productivity of firms.

**Mitra** and **Trindade** focus on the role of inequality in the determination of trade flows and patterns. With non-homothetic preferences, when countries are similar in all respects but asset inequality, trade is driven by specialization in *consumption*, not production, the authors find. These assumptions allow them to generate some interesting international spillover effects of redistributive policies. They also look at the effects of combining inequality and endowment differences on trade flows, and see that this has implications for "the mystery of the missing trade." Next they study a model of monopolistic competition, and find a novel V-shaped relationship between the ratio of inter-industry to intra-industry trade and a country's inequality. Finally, they look at how international differences in factor endowments affect this relationship between the ratio of inter- to intra-industry trade and inequality. Their theory formalizes as well as modifies Linder's conjecture about the relationship between intra-industry trade and the extent of similarity between trading partners.

Economists emphasize the benefits from free trade attributable to international specialization, but typically only narrowly measure what matters to individuals. Critics of free trade, by contrast, focus on the pattern of consumption in society and the nature

of goods being consumed, but often fail to take into account the gains from specialization. **Janeba** develops a new framework to study the effects of trade liberalization on cultural identity and trade in cultural goods. He first describes the process of trade liberalization in the audiovisual sector with an emphasis on the film industry. Traditional political economy approaches or increasing-returns-to-scale models cannot account for the extent and type of state interventions throughout the world. In the theoretical model, cultural identity emerges as the result of the interaction of individual consumption choices. In a Ricardian model of international trade, Janeba shows, trade is not Pareto inferior to autarky, is not Pareto superior to autarky (if the world is culturally diverse under free trade), and everybody within a country can lose from free trade if the country is culturally homogenous under autarky.

**Ghironi** and **Melitz** develop a stochastic, general equilibrium, two-country model of trade and macroeconomic dynamics. Productivity differs across individual, monopolistically competitive firms in each country. Firms face some initial uncertainty concerning their future productivity when making an irreversible investment to enter the domestic market. In addition to the sunk entry cost, firms face both fixed and per-unit export costs. Only a subset of relatively more productive firms export, while the remaining, less productive firms only

serve their domestic market. This microeconomic structure endogenously determines the extent of the traded sector and the composition of consumption baskets in both countries. Exogenous shocks to aggregate productivity, sunk entry costs, and trade costs induce firms to enter and exit both their domestic and export markets, thus altering the composition of consumption baskets across countries over time. The microeconomic features have important consequences for macroeconomic variables. Macroeconomic dynamics, in turn, feed back into firm-level decisions, further altering the pattern of trade over time. This model generates deviations from purchasing power parity that would not exist without a microeconomics structure with heterogeneous firms. It provides an endogenous, microfounded explanation for a Harrod-Balassa-Samuelson effect in response to aggregate productivity differentials and deregulation. In addition, the deviations from purchasing power parity triggered by aggregate shocks display substantial endogenous persistence for very plausible parameter values, even when prices are fully flexible.

For the first-generation models of *very* long-run growth, empirical success has been mixed. As growth theory now moves beyond one-sector, one-country models, the “industrial revolution” typically is mapped onto a modern-traditional goods dichotomy with differential productivity in rich and

poor countries. **Bergin**, **Glick**, and **Taylor** argue for the usefulness of an alternative framework, in which goods are differentiated by tradability and productivity. The two characteristics can interact, and can help to explain an important, but little noticed stylized fact: that, over time, the Balassa-Samuelson effect is getting stronger and stronger. Previous studies have missed this fact. Theorists have not employed it as a check on the model. Being unnoticed, it has gone unexplained. The authors employ a Ricardian continuum-of-goods model to explain this fact and find that endogenous tradability allows for theory and history to be consistent under a wide range of underlying productivity shocks. Moreover, this theory could illuminate studies of economic growth, both past and present.

Geography shapes economic outcomes in a major way. **Keller** and **Shiue** use spatial empirical methods to detect and analyze trade patterns in a historical dataset on Chinese rice prices. Their results suggest that spatial features were important for the expansion of interregional trade. Geography dictates, first, over what distances trade was possible in different regions, because the costs of ship transport were considerably less than those for land transport. Spatial features also influence the direction in which a trading network is expanding. Moreover, this analysis captures the impact of new trade routes, both within and outside the trading areas.

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Finding hard copies of the early papers, which did not exist in electronic format, involved some detective work on the part of NBER Research Associate Dan Feenberg and his assistant Inna Shapiro. As Feenberg describes: “When we started putting up the full text of Working Papers in 1996, there was no question in my

mind that we wanted to have all working papers back to Number 1 online, but the cost was an obstacle. I did realize that we would get requests for older papers, so we put a note on the website offering to scan and make available any paper for \$10. This was surprisingly successful, in that anywhere from 5 to 20 requests came in each week, and my assistant Inna Shapiro scanned them in-house.”

Nonetheless, he continues, “almost 100 papers were completely missing from our files. We found about 60 of them at Harvard’s Littauer Library and many of the remaining ones at MIT.

The IMF Library came up with five papers, and the Federal Reserve Bank of Philadelphia’s Library with three, including the crucial NBER Working Paper Number 1, a 132-page blockbuster. At the moment, the only paper clearly still missing is Number 25, ‘The Covariance Structure of Earnings and the On the Job Training Hypothesis’ by John Hause, issued in December 1973. (So, if you have a copy, we’d like to borrow it.)”

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## Bureau Books

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### Innovation Policy and the Economy, Volume 4

*Innovation Policy and the Economy*, Volume 4, edited by Adam B. Jaffe, Josh Lerner, and Scott Stern, will be available from The MIT Press in January. This annual NBER series provides a forum for research on the interactions among public policy, the innovation process, and the economy. The discussions cover various policies that affect the ability of an economy to achieve scientific and technological progress, or the impact of science and technology on economic growth. The resulting volumes are designed to be of interest to general readers who wish to learn more about public policy, as well

as to economists. Among the issues covered in this year’s volume are: the changing pressures on defense R and D in the anti-terrorist era; the extent to which market failures can be used to justify expenditures on energy and environmental R and D; and the need to rethink key aspects of the patent system.

The paperback volume is priced at \$25; the hardcover will cost \$58. They can be ordered directly from: The MIT Press, c/o Trilateral, 100 Maple Ridge Drive, Cumberland, RI 02864, tel: 1-800-405-1619 or 401-658-4226; fax: 1-800-406-9145 or 401-531-2801; emails

should be sent to [mitpress-orders@mit.edu](mailto:mitpress-orders@mit.edu).

Jaffe, Lerner, and Stern are members of the NBER’s Program on Productivity and Technological Change. Jaffe is also Chairman of the Economics Department at Brandeis University. Lerner is the Jacob H. Schiff Professor of Investment Banking at Harvard Business School. Stern is an Associate Professor of Management and Strategy at the Northwestern University’s Kellogg School of Management.



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.

## Challenges to Globalization: Analyzing the Economics

*Challenges to Globalization: Analyzing the Economics*, edited by Robert E. Baldwin and L. Alan Winters, will be available soon from the University of Chicago Press. This volume includes the papers and discussions from a recent International Seminar on International Trade, co-sponsored by the NBER, the Centre for Economic Policy Research in London, and the SNS in Stockholm.

Many groups passionately disagree about the nature of the globalization process. This volume evaluates

the economic arguments regarding globalization's relationship to democracy, its impact on the environment, and the associated expansion of trade and its effects on prices. The papers focus, among other topics, on the infamous brain drain, sweat shop labor, wage levels, and changes in production processes. Contributors to this volume look at multinational firms, foreign investment, and mergers and acquisitions. Their findings often run counter to the claim that multinational firms primarily seek countries with low wage

labor. The book closes with a survey of the last fifty years of research on the relationship between international economic policies and national economic growth rates.

Baldwin is an NBER Research Associate and professor emeritus of economics at the University of Wisconsin-Madison. Winters is professor of economics at the University of Sussex. The price of this volume is \$95.00.

## Governance, Regulation, and Privatization in the Asia-Pacific Region

*Governance, Regulation, and Privatization in the Asia-Pacific Region*, edited by Takatoshi Ito and Anne O. Krueger, will be available soon from the University of Chicago Press. It is the twelfth conference volume resulting from the NBER's East Asia Seminar on Economics.

Over the last twenty-five years, the move toward privatization and away from government regulation has accelerated. This volume is the first thorough account of the relative suc-

cess of the different approaches to privatization as undertaken in Korea, China, Australia, and Japan. The contributors analyze evolving approaches to contract negotiations, shareholders' rights, expectations of transparency, and accounting procedures, and chart the tricky terrain that characterizes private sector relations with the government. Part one is theoretical in nature; part two presents country studies. The volume concludes with papers on such controversial issues as telecommunica-

tions security and federal buyouts of distressed banks.

Ito is a Research Associate in the NBER's Program on International Trade and Investment and a professor at the University of Tokyo. Krueger is currently on leave as a research associate of the National Bureau of Economic Research while she serves as First Deputy Managing Director of the International Monetary Fund.

This volume is priced at \$95.

## Social Security Programs and Retirement around the World: Micro-Estimation

*Social Security Programs and Retirement around the World: Micro-Estimation*, edited by Jonathan Gruber and David A. Wise, will be available soon from the University of Chicago Press. This NBER Conference Report is the second volume presenting results of an ongoing research project organized through the NBER's Program on the Economics of Aging. It continues the analysis of the relationship between social security and labor supply.

As shown in Gruber and Wise's 1999 book, *Social Security and Retirement around the World*, in many countries there are enormous disincentives to continued work at older ages. The current volume presents a country-by-country analysis of retirement behavior based on data compiled by research teams in 12 countries, resulting in comprehensive databases of individuals that match information on retirement decisions to the retirement incentives inherent in the social securi-

ty provisions of each country.

Gruber directs the NBER's Program on Children and is a professor of economics at MIT. Wise directs the NBER's Program on Health and Retirement and is the John F. Stambaugh Professor of Political Economy at the John F. Kennedy School of Government, Harvard University. This conference volume is priced at \$99.00.

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10009	Peter F. Christoffersen Francis X. Diebold	Financial Asset Returns, Direction-of-Change Forecasting, and Volatility Dynamics
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10011	Jin-Tan Liu James K. Hammitt Jung-Der Wang Meng-Wen Tsou	Valuation of the Risk of SARS in Taiwan
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