

## IN THIS ISSUE

- Bulls, Bears, and Retirement Behavior
- Effects of Co-Payment on Prescription Drug Demand
- How Households Responded to Tax Rebates of 2001
- The Lock-in Effect of California's Proposition 13
- New Drugs and HIV Mortality
- Globalization and Poverty in Mexico

## Bulls, Bears, and Retirement Behavior

Conventional wisdom — backed by some statistical studies — holds that a plunging stock market causes workers to postpone retirement, and conversely that a booming market inspires early retirement. But in **Bulls, Bears, and Retirement Behavior** (NBER Working Paper No. 10779), authors **Courtney Coile** and **Phillip Levine** find no evidence that changes in the stock market drive aggregate trends in retirement behavior.

Coile and Levine analyze the relationship between stock market performance and retirement over the past two decades, giving special attention to the Wall Street boom years of 1995-9 and the bust period of 2000-2. In their study, they use data from three sources: the Health and Retirement Study (HRS), a longitudinal survey of near-retirement age households that began in 1992; the Current Population Survey (CPS), a monthly survey that forms the basis of most published U.S. labor statistics; and the Survey of Consumer Finances (SCF), a triennial survey focused on household wealth holdings.

The authors take advantage of what amounts to a double experiment in which groups with greater exposure to the stock market are predicted to be more likely to retire during the boom and less likely to retire during the bust relative to other groups. Their overall goal is to estimate the relationship between market fluctuations and aggregate changes in retirement, as opposed to estimating individual wealth effects.

Coile and Levine begin by documenting trends in retirement patterns and show that there was a large drop in retirement rates in 2000, the year the stock market fell precipitously. However, they point out that retirement rates were also lower during the boom years of the late 1990s than they had been in the early 1990s or 1980s. Then they present descriptive statistics detailing the stock market holdings of older households in the late 1990s. They show that relatively few older households had large stock holdings

cases, they fail to find the expected pattern.

Coile and Levine conclude that their results do not necessarily contradict previous studies that have found wealth effects associated with changes in the stock market or other wealth shocks. Indeed, they say it is almost certain that some individuals experienced large drops in wealth because of the market bust and as a result postponed retirement. But Coile and Levine suspect that this is a fairly narrow segment of the population; as their

---

“Statistical results firmly refute the notion that the 2000 drop in retirement was linked to the stock market.”

---

prior to the market drop in 2000 and that these households would have to have been extremely sensitive to stock losses for the stock market decline to have caused the observed drop in retirement rates

Next, the researchers compare the impact of stock market fluctuations on the retirement behavior of individuals who are likely to have been differentially affected by changes in the market, such as persons with and without defined contribution pension plans. Evidence supporting an impact of the stock market on retirement decisions would require that those who are more likely to own stock are more likely to retire in boom periods and less likely to retire in bust periods. The researchers further apply the same strategy to an analysis of labor force re-entry decisions. In both

analysis shows, most workers of near-retirement age have few if any stock assets. Therefore, they say, it seems unlikely that even a substantial labor supply response by that group could be driving changes in aggregate labor market trends.

Coile and Levine acknowledge that their results do not explain the drop in labor market activity among older workers in the bust year of 2000. They theorize that the drop may have been merely a realization of a longer-term decline in retirement among older workers. However, they maintain that their statistical results firmly refute the notion that the 2000 drop in retirement was linked to the stock market.

The researchers also assert that, despite their findings, stock market fluctuations are likely to have broad-

er implications for individual's behavior and well-being. Recent retirees, workers nearing retirement, and workers further from retirement all may respond in any number of ways, such as changing their level of consumption, altering savings and investment activities, updating expectations about leaving a bequest,

adjusting longer-term retirement plans, or reconsidering if and how long spouses should work.

Indeed, Coile and Levine believe that the drop in wealth resulting from the market bust in 2000 was likely reflected in changes in consumption and possibly in other behaviors to a much greater

degree than changes in labor supply of near-retirement age workers or recent retirees. "The results of our analysis," write Coile and Levine, "provide little support for an impact of the boom and bust on retirement or labor force re-entry."

— Matt Nesvisky

## Effects of Co-payment on Prescription Drug Demand

In the United States, overall drug spending in the private sector rose by 15-20 percent per year during the 1990s. In 2002 alone, national spending on prescription drugs exceeded \$160 billion. Because of these increased costs, some employers and insurers are redesigning health insurance plans to allow for greater sharing of costs with consumers. In particular, they are moving from insurance systems with flat co-payments (where policy holders pay a specific dollar amount per prescription) to systems of coinsurance (where policy holders pay a fixed percentage of the total prescription price).

Studies have shown that greater cost sharing reduces consumer spending on prescription drugs and therefore lowers employer costs. Others have argued that this trend does not undermine overall health, since patients facing rising costs will reduce consumption of nonessential medications more than consumption of vital chronic care drugs.

However, the case of medications with preventive benefits, that is that prevent future illnesses and complications, may be different. Here, patients do not always understand the long-term benefits of continued use. "In this case, underutilization may be the problem, and 'too much' cost-sharing may lead to a loss of welfare," **Avi Dor** and **William Encinosa** argue in **Does Cost Sharing Affect Compliance? The Case of Prescription Drugs** (NBER Working Paper No. 10738.)

The authors explore the impact of cost sharing on "compliance" — that is, on the adherence to refilling

prescriptions for preventive care drugs. They examine the effect of rising cost sharing as well as the differing impact of co-payment and coinsurance systems. They focus on diabetes, a chronic condition affecting 16.2 million Americans and a leading cause of adult blindness, kidney failure, amputations, and heart disease. "As the incidence of diabetes reaches epidemic proportions, leading to spiraling costs, the need to undertake preventive measures is becoming even more pronounced."

Dor and Encinosa collect a sample of 27,057 adult individuals with chronic type II diabetes who need ongoing oral medications. Of these, 20,494 people are covered by insurance plans requiring consumers to pay a flat co-payment per prescription, while the 6,563 remaining individuals are covered by coinsurance plans. The authors divide the

the prior prescription. By the fourth week, more than 60 percent were fully compliant. This figure "tapers off" to about 58 percent by the end of the 90 days. Under the coinsurance model, individuals display a similar pattern, except that compliance is systematically about 10 percent lower. In the first week following the end of the prescription, about 44 percent fully complied. By the fourth week, 50 percent were fully compliant, tapering off to 48 percent by the end of the 90 days. And over the course of the 90 days, about 14 percent of the initial non-compliers eventually became partially compliant, similar to the proportion (15 percent) under the co-payment regime.

What happens when consumers shoulder an increased portion of the costs? In the co-payment sample, a simulated increase from \$6 to \$10 in the up-front co-payment

---

"Switching from a proportional coinsurance payment formula to a formula based on flat co-payments in the soon-to-be-enacted Medicare prescription drug benefit may lead to increased compliance, while maintaining budget-neutrality."

---

individuals into three groups: non-compliers, who do not refill their prescription within 90 days of the first prescription running out; partial compliers, who buy at least one more prescription within 90 days but not enough to cover the full 90 days; and fully compliant individuals, who buy one or more prescriptions within 90 days and cover all 90 days.

Under the co-payment regime, about 54 percent of patients were fully compliant within the first week of the 90 days following the end of

results in a 6.2 percent increase in noncompliance and a 9 percent reduction in the share of fully compliant persons. In the coinsurance sample, a proportional increase in the coinsurance rate (from 20 percent to 75 percent) results in a 9.9 percent increase in non-compliance and a 24.6 percent reduction in fully compliant individuals. In another test, holding the out-pocket share constant at \$15 in both samples leads to a much higher non-compliance in the coinsurance sample (45.3

percent compared with 35 percent in the co-payment sample).

Dor and Encinosa then perform a rough cost-benefit analysis of an increased co-payment. Under a \$6 co-payment, the national costs of compliance are equivalent to \$632.7 million per 90 days, while the costs fall to \$601.5 million under a \$10 co-payment. The savings from increasing the co-payment thus reach \$31.2 million per 90 days, or \$124.8 million per year, equal to 4.9 percent of annual national spending on anti-diabetic medications. However, the increase in non-compliance rates as a result of the higher co-payment would also increase the rate of diabetic complications (such as blindness, heart disease, and the like) by an estimated \$360 million per year, far exceeding the initial

cost savings.

“The results suggest that increasing cost sharing leads to greater non-compliance, and to lower compliance in both regimes,” explain the authors. However, the negative effects of cost sharing on non-compliance are much larger in the coinsurance regime than under the co-payment system. The authors hypothesize that this effect is attributable to greater uncertainty regarding the out-of-pocket costs for consumers under the coinsurance regime.

Dor and Encinosa conclude that efforts to impose higher cost sharing for prescription drugs may ignore the role of prescription drugs in preventing future medical complications from chronic conditions. Also, since non-compliance is high-

er under coinsurance than under fixed co-payment systems, both private and public insurance providers may be able to reduce overall medical costs by switching from coinsurance to co-payment systems. “Apparently, many employers are moving in the wrong direction,” Dor and Encinosa note. In 2002, some 19 percent of employers offering prescription drug benefits to employees switched from co-payments to coinsurance when the contracts expired. The authors also suggest that switching from a proportional coinsurance payment formula to a formula based on flat co-payments in the soon-to-be-enacted Medicare prescription drug benefit may lead to increased compliance, while maintaining budget-neutrality.

— Carlos Lozada

## How Households Responded to Tax Rebates of 2001

In March 2001, the U.S. economy entered a recession. In response, the Economic Growth and Tax Relief Reconciliation Act of 2001 included a large income tax rebate program intended to stimulate consumption demand and ameliorate the recession. The program sent tax rebates, typically \$300 or \$600 in value, to about two-thirds of U.S. households. Because there have been relatively few instances of such active, counter-cyclical fiscal policies in U.S. history, there was little evidence available on whether this rebate program would indeed help to end the recession. In other words, how much of their rebates would consumers spend?

Economic theory is generally pessimistic about the efficacy of such counter-cyclical tax policies. According to the rational-expectations Permanent-Income Hypothesis, households should decide on a level of consumption based on a long-term view of their resources. In this case, a single rebate would have little effect on spending. Further, the theory predicts that, in the absence of liquidity constraints, spending should increase as soon as consumers begin

to expect some tax cut, and not increase only after they actually have received the rebate check.

Shortly after the passage of the 2001 Tax Act, **David Johnson**, **Jonathan Parker**, and **Nicholas Souleles**, working with the Bureau of Labor Statistics and other government agencies, added a special group of questions about the tax rebates to

over a ten-week period from late July to the end of September 2001. Most importantly, the particular week in which a check was mailed depended on the second-to-last digit of the taxpayer’s Social Security number, a number that is effectively randomly assigned. This randomization allows the authors to identify the causal effect of the rebate by comparing

---

“The [tax] rebates did increase consumer spending significantly, helping to end the recession of 2001.”

---

the Consumer Expenditure Survey, the most comprehensive ongoing measure of U.S. household expenditure. In **Household Expenditure and the Income Tax Rebates of 2001** (NBER Working Paper No. 10784), they analyze the responses to these questions, and conclude that the rebates did increase consumer spending significantly, helping to end the recession of 2001.

Their analysis uses a unique feature of the rebate program. Because it was administratively difficult to print and mail the rebate checks all at once, they were mailed out over a

the spending of households that received the rebate earlier to the spending of households that received it later. This also allows the rebates to be distinguished from other concurrent factors that affect consumption and might otherwise confound inference about the rebate (for example, concurrent changes in monetary policy, or the stock market, or the advent of zero-percent auto financing, and so on).

The authors find that “the average household spent 20-40 percent of its 2001 tax rebate on non-durable goods during the three-

month period in which the rebate was received.” Further, “[r]oughly two-thirds of the rebates were spent during the quarter of receipt and subsequent three-month period.” In dollar terms, households increased their expenditures on food by \$51 and their expenditures on non-durable goods by \$179 on average in the quarter of receipt, which correspond to a 2.7 percent rise in expenditures on food and a 3.2 percent rise in expenditures on non-durable

goods. These findings run counter to the Permanent-Income Hypothesis.

The authors also investigate whether some households were more likely to spend the rebate than others. They find that “[t]he expenditure responses are largest for households with relatively low liquid wealth and low income, which is consistent with liquidity constraints.” In all, the rebates totaled \$38 billion, or about 7.5 percent of personal consumption expenditures on non-

durable goods in the third quarter of 2001. The authors’ estimates imply that the rebates increased aggregate consumption expenditures on non-durable goods by 2.9 percent and 2.0 percent in the third and fourth quarters of 2001. The timing and magnitude of this response is consistent with the rebate program playing a large role in counteracting the 2001 recession, which ended in the fourth quarter with strong growth in aggregate consumption.

## The Lock-in Effect of California’s Proposition 13

**P**roposition 13, adopted by California voters in 1978, mandates a property tax rate of one percent, requires that properties be assessed at market value at the time of sale, and allows assessments to rise by no more than 2 percent per year until the next sale. This means that as long as property values increase by more than 2 percent per year, homeowners gain from remaining in the same house because their taxes are lower than they would be on a different house of the same value. Proposition 13 thus gives rise to a lock-in effect for owner-occupiers that strengthens over time. It also affects the rental market, both directly because it applies to landlords and indirectly because it reduces the turnover of owner-occupied homes.

As a result of Proposition 13, there are obvious distortions in the real estate marketplace. For example, in 2003 financier Warren Buffett announced that he pays property taxes of \$14,410, or 2.9 percent, on his \$500,000 home in Omaha, Nebraska, but pays only \$2,264, or 0.056 percent, on his \$4 million home in California. Although Buffet is known as an astute investor, the low property taxes on his California home are not attributable to his investment prowess, but rather to Proposition 13.

In 1992, the U.S. Supreme Court upheld Proposition 13, in part on the grounds that it furthered the

policy goals of increasing “...local neighborhood preservation, continuity, and stability.” In **Property Tax Limitations and Mobility: The Lock-in Effect of California’s Proposition 13** (NBER Working Paper No. 11108), authors **Nada Wasi** and **Michelle J. White** examine how Proposition 13 has affected the average tenure of owners and renters in California versus other states. They find that Proposition 13 definitely furthered continuity and stability, because it caused a substantial increase in the average tenure of California households relative to that

than white households and out-of-state migrant households responded more strongly than native-born households. From 1970 to 1990, the tenure length of African-American homeowners and renters increased by 1.3 years and 1.8 years, respectively, relative to that of white homeowners and renters. From 1970 to 2000, the tenure length of migrant homeowners and renters increased by 1.5 years and .6 years, respectively, relative to that of native-born homeowners and renters.

The effect of Proposition 13 on mobility varies widely depending

---

“The effect of Proposition 13 on mobility varies widely depending on the size of the subsidy, with the largest effects occurring in coastal California cities where the increase in property values has been greatest.”

---

of households in other states. From 1970 to 2000, the average tenure of California homeowners and renters increased by 1.04 and .79 years relative to that of homeowners and renters in the control states. These figures represent increases in average tenure of 10 percent and 19 percent, respectively.

The large effect of Proposition 13 on renters’ tenure is particularly striking and suggests that longer tenure by owner-occupiers forces younger households to delay their transition from renting to owning. The authors also find that African-American households responded more strongly to Proposition 13

on the size of the subsidy, with the largest effects occurring in coastal California cities where the increase in property values has been greatest. From 1970 to 2000, average tenure length increased by less than one year in inland California cities, but by more than two years in the Los Angeles area and by three years in the Bay area. As the authors suggest, whether the Proposition 13-induced increases in continuity and stability have been worth the cost in lost tax revenue and the resulting redistribution from inland to coastal California communities remain subjects for further research.

— Les Picker

## New Drugs and HIV Mortality

From 1991 to 1995, HIV/AIDS was the leading cause of death among men between the ages of 25 and 44 in the United States and the eighth leading cause of death overall. In a four-month period from November 1995 through March of 1996, the U.S. Food and Drug Administration (FDA) approved four new prescription drugs — Efavir and the first three protease inhibitors — for the treatment of this illness, which doubled the number of available treatments. The new prescription drugs reduced the viral load in patients and increased the concentration of a type of blood cell critical for fighting off infections. The use of Efavir and the protease inhibitors spread rapidly, and by the end of 1996, almost 60 percent of HIV/AIDS patients were using one or more of these four new agents. Mortality rates fell by nearly 70 percent from 1995 to 1998.

“Despite a decline in infection rates, the number of individuals living with this illness continued to rise because of the increase in life expectancy,” note **Mark Duggan** and **William Evans** in **Estimating the Impact of Medical Innovation: The Case of HIV Antiretroviral Treatments** (NBER Working Paper No. 11109). Their study finds that the increased use of these four new treatments was responsible for more than 90 per-

cent of the 1995-8 drop in the mortality rate. Although the FDA has approved more than a dozen additional drugs for treatment of the disease in the last nine years, mortality rates have remained virtually unchanged.

Duggan and Evans use data for the 1993-2003 period from a sample of more than 10,000 Medicaid recipients living in California who

patients with HIV/AIDS. Even with the reduction in hospital spending, the introduction of these drugs led to a threefold increase in total Medicaid spending during the life of patients. This is because the drugs have a high cost and the patients had longer durations on the program because of their greater life expectancy. The authors’ simulations suggest that lifetime Medicaid

---

“The increased use of these four new treatments was responsible for more than 90 percent of the 1995-8 drop in the mortality rate... the cost per life-year saved was approximately \$22,000.”

---

were diagnosed with HIV/AIDS. Approximately half of U.S. residents diagnosed with AIDS are enrolled in Medicaid. No prior study has examined as large a sample of patients for as long a time period. Their findings demonstrate that the most severely ill patients were significantly more likely to take the drugs and that these patients experienced the greatest reductions in absolute mortality. While mortality rates among men were 80 percent higher than among women before the new treatments were introduced, these differences almost disappeared during the next two years because of the greater utilization of the treatments by men.

The use of the new drugs also reduced hospital admission rates for

spending for the average patient increased by more than \$200,000. Despite this, they conclude, Efavir and the first three protease inhibitors were cost effective. Their findings suggest the cost per life-year saved was approximately \$22,000. That number is on the low end of estimates of other important medical interventions. However, the benefit-cost ratio for the prescription drugs approved to treat HIV/AIDS since early 1996 have been less favorable, as prescription drug spending to treat the disease has continued to rise but there has been little further decline in patient mortality.

— David R. Francis

## Globalization and Poverty in Mexico

With all the talk these days about globalization and its discontents, the tendency is to focus on the alleged damage suffered by people with the greatest exposure to its most common manifestations, such as lower trade barriers and relaxed rules for foreign investment. But what about people who have been largely bypassed by globalization?

In Mexico, it appears that people living in areas with the least exposure to globalization —

regions that are not attracting foreign investment and are lacking in industries that serve international markets — are lagging behind those residing in regions that have felt its full force. In **Globalization, Labor Income, and Poverty in Mexico** (NBER Working Paper No. 11027) NBER Research Associate **Gordon Hanson** asserts that in the 1990s, incomes fared relatively poorly in parts of Mexico that experienced little of the effects of globalization

when compared to the so-called “high exposure” states of northern Mexico whose export-oriented industries have been magnets for foreign investors.

Hanson finds that average labor earnings decreased by 10 percent for “low exposure” states, which are located mainly in the south, relative to high exposure states. In addition, during the 1990s, the low exposure areas saw a comparative increase in workers who

could not earn enough to keep their families out of poverty. “This is further evidence that during Mexico’s globalization decade individuals born in states with high-exposure to globalization have done relatively well in terms of their labor earnings,” he states.

Hanson acknowledges that incomes traditionally have been higher in the northern states than in the south. However, prior to the mid-1980s, when Mexico began dropping barriers to trade and investment, income differences between the two regions were actually narrowing. “The process of income convergence in Mexico came to a halt in 1985, coinciding with the onset of trade liberalization,” he writes. “Since 1985, regional incomes have diverged in the country. The pattern of income growth I uncover does not appear to have been evident in the early 1980s or before.”

The benefits of liberalization also helped northern states weather economic crisis. While incomes in both regions suffered during the peso collapse of the mid-1990s, Hanson finds that “the deterioration was much less severe” in the northern tier, as it occurred during the banking crisis and a subsequent nationwide downturn in economic activity.

Mexico has become a popular tableau for the study of the effects of globalization. According to

Hanson, that’s because the country has been so aggressive at opening up its economy to the rest of the world. Mexico started in 1985 by unilaterally cutting tariffs and eliminating other restrictions on trade. It then acted in 1989 to end many restrictions on foreign investment, and culminated the liberalization process in 1994 with the signing of the North American Free Trade Agreement (NAFTA).

---

“Incomes fared relatively poorly in the parts of Mexico that experienced little of the effects of globalization when compared to the so-called high exposure states of northern Mexico whose export-oriented industries have been magnets for foreign investors.”

---

Hanson observes that, “partly as a result of these policy changes, the share of international trade in Mexico’s GDP has nearly tripled, rising from 11 percent in 1980 to 32 percent in 2002.”

Hanson notes that there could be several interpretations of his findings. One is the simple fact that when barriers to trade and investment fall, incomes will rise in areas that are most adept at participating in the global economy.

But Hanson says that others may view the income growth in the north and its relative stagnation in the south as unrelated to globalization. For example, some observers might associate the income gains in the northern states with the privati-

zation and deregulation of Mexican industry and the reform of Mexico’s land-tenure system. Hanson says that these changes actually should be of more benefit to the less unionized and more agrarian southern states and ultimately do not offer an alternative explanation for his findings.

Still, Hanson reports that while there is much evidence that globalization, or, in the south, the

lack thereof, has a strong association with income levels, he observes that one has to be cautious about forcefully stating cause and effect. “In the end, we can only say that I find suggestive evidence that globalization has increased relative incomes in Mexican states that are more exposed to global markets,” he writes.

Also, if this is in fact the case, Hanson points out that it’s still not clear how governments should respond to such a connection. “The policy implications are unclear,” Hanson concludes, “as I leave unanswered the question of how one goes about increasing regional exposure.”

— Matthew Davis

---

## NBER

---

*The National Bureau of Economic Research is a private nonprofit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers are:*

*Martin Feldstein — President and Chief Executive Officer*

*Susan Colligan — Vice President for Administration and Budget*

*Michael H. Moskow — Chairman*

*Elizabeth E. Bailey — Vice Chairman*

*Contributions to the National Bureau are tax deductible. Inquiries concerning the contributions may be addressed to Martin Feldstein, President, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.*

*The NBER Digest summarizes selected Working Papers recently produced as part of the Bureau’s program of research. Working Papers are intended to make preliminary research results available to economists in the hope of encouraging discussion and suggestions for revision. The Digest is issued for simi-*

*lar informational purposes and to stimulate discussion of Working Papers before their final publication. Neither the Working Papers nor the Digest has been reviewed by the Board of Directors of the NBER.*

*The Digest is not copyrighted and may be reproduced freely with appropriate attribution of source. Please provide the NBER’s Public Information Department with copies of anything reproduced.*

*Preparation of the Digest is under the editorial supervision of Donna Zerwitz, Director of Public Information.*

*Individual copies of the NBER Working Papers summarized here (and others) are available free of charge to Corporate Associates. For all others, there is a charge of \$5.00 per downloaded paper or \$10.00 per hard copy paper. Outside of the United States, add \$10.00 per order for postage and handling. Advance payment is required on all orders. To order, call the Publications Department at (617) 868-3900 or visit [www.nber.org/papers](http://www.nber.org/papers). Please have the*

*Working Paper Number(s) ready.*

*Subscriptions to the full NBER Working Paper series include all 700 or more papers published each year. Subscriptions are free to Corporate Associates. For others within the United States, the standard rate for a full subscription is \$2525; for academic libraries and faculty members, \$1475. Higher rates apply for foreign orders. The on-line standard rate for a full subscription is \$1750 and the on-line academic rate is \$725.*

*Partial Working Paper subscriptions, delineated by program, are also available. For further information, see our Web site, or please write: National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.*

*Requests for Digest subscriptions, changes of address, and cancellations should be sent to Digest, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. Please include the current mailing label.*