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When Taxpayers Ignore Less Visible Taxes

When analyzing tax policies, economists traditionally have assumed that individuals take maximum advantage of (that is, optimize fully with respect to) the incentives created by those policies. In **Saliency and Taxation: Theory and Evidence** (NBER Working Paper No. 13330), **Raj Chetty**, **Adam Looney**, and **Kory Kroft** test that assumption by studying whether the *saliency* (or visibility) of tax rates affects consumers' purchase decisions. The researchers find that saliency is quite important in their data, and that saliency matters because shoppers are inattentive to taxes. They develop a new theoretical model to analyze the economic effects of taxation with inattentive individuals.

To begin their investigation, Chetty, Looney, and Kroft partnered with a supermarket chain to conduct a three-week experiment in one of its stores. For taxable items, like cosmetics and other non-food products, stores customarily do not include the sales tax in the price tags on the shelves. Instead, the tax appears only on the sales slip when the purchases are rung up at the cash register, making them less salient to the consumer. In the targeted store, the researchers adjusted the price tags to display prices including the 7.375 percent sales tax. The result was a decline in sales of those items by 6 to 8 percent. Reminding shoppers of the tax at the time of purchase made for more cautious consumers, suggesting that most of them do not normally take into account the sales tax on such products.

To complement this experimental evidence, Chetty, Looney, and Kroft ran a second test using observational data over a longer time period and comparing the effect of price

changes with tax changes. Here they focused on alcohol consumption, because alcohol is subject to both the (salient) excise tax, which is included in the shelf price, and the less-salient sales tax that appears only at the cash register. Looking at state-level changes in these

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two tax rates between 1970 and 2003, and at data on annual alcohol consumption by state, the researchers found that the drop in consumption attributable to increases in the excise taxes was measurably larger than the reduction caused by the increases in sales taxes. Thus, sales and excise taxes appear to induce different consumer behavior in both the short and the long run.

The researchers identify two possible explanations for why consumers underreact to taxes that are not included in posted prices. One is that shoppers are ignorant of the sales tax rate or of which items are taxable. Another is that saliency matters: that is, shoppers know what is taxed, yet still focus on the posted price. To distinguish these explanations, Chetty, Looney, and Kroft surveyed supermarket customers and found that their awareness of the tax rate and of what items were taxable was very high. The researchers concluded that when shoppers make their purchases, they simply do not bother to compute tax-inclusive prices.

To explain this behavior and understand its implications for tax policy, Chetty, Looney, and Kroft develop a theoretical model of inat-

tentive consumers and tax policy. Their first observation is that from an individual's perspective, the cost of not paying attention to taxes is actually quite small. For example, they calculate that the value of learning about a 10 percent tax on an item that costs \$1,000 (and

thus choosing to spend less on that item) is only \$5. Hence, it is not surprising that people who have limited time or attention ignore taxes. Surprisingly, though, the authors show that these same taxes can be quite important from a *social* perspective: a 10 percent tax raises a substantial amount of revenue for the government, and can create substantial social efficiency costs by distorting economic decisions.

In the authors' model, the tax policies differ substantially from the predictions of the traditional theory that assumes that everyone pays attention to all taxes. A key prediction of the traditional theory is that a tax creates an efficiency cost—that is, a loss of aggregate economic welfare—only to the extent that it reduces demand for the taxed good. In the authors' model of inattentive consumers, a tax can have a substantial efficiency cost even when the demand for the taxed good does *not* change. This is because a tax that is completely ignored by consumers distorts consumption of other goods. For example, an individual who does not account for taxes on cars would over-spend on the car and end up with less money left than he would like for food or

healthcare, reducing economic welfare.

Another implication of the model is that the incidence or pass-through of the tax — that is, who ultimately bears the burden of paying the tax once price changes are taken into account — depends on whether the tax is levied on consumers or firms. This result challenges the conventional wisdom that it does not matter if the government taxes consumers or firms, which again is based on the presumption that all individuals pay attention to taxes. The authors give the example of a cell-phone

plan whose “sticker price” is \$39.99 but whose actual price, including taxes and fees levied on the consumer, may be \$47.00. If the same taxes were levied on the firm, it could only pass them through by raising the sticker price, thereby reducing demand. Therefore, firms would be more likely to bear the burden of the tax if it were levied on them rather than on the consumers.

The finding that individuals optimize inaccurately — even with respect to relatively simple sales taxes — suggests that similar issues

may arise in the analysis of a broad set of government policies. The approach proposed by Chetty, Looney, and Kroft could shed light on a wide range of issues that have received attention in recent policy debates, such as consumption taxation (where taxes may be included in posted prices), social security reform (where the link between taxes paid and benefits received is currently not salient), and the value of simplifying the tax code.

—Matt Nesvisky

The Rise and Fall of the College Graduate Wage Premium

The wage premium for workers in occupations requiring high levels of education was exceptionally high in 2005. But this is not the first time that the gap has been so wide. In 1915, for example, the premium for a college education was also large. In the decades in between, the United States saw the earnings gap between the more educated and the less educated narrow dramatically, up until the early 1950s, and then begin to widen rapidly again after 1980.

What caused these changes? In **The Race Between Education and Technology: The Evolution of U.S. Educational Wage Differentials, 1890 to 2005** (NBER Working Paper No. 12984), co-authors **Claudia Goldin** and **Lawrence Katz** conclude that “strong secular growth in the relative demand for more educated workers combined with fluctuations in the growth of relative skill supplies go far to explain the long-run evolution of U.S. educational wage differentials.”

Using this supply-demand framework, the authors find that from 1915 to 1940, the relative demand for college graduates (those with 16 or more years of schooling) grew at an average rate of 2.16 to 2.41 percent per year. But the supply of college-educated workers grew at an average 3.19 percent annually during the same period. Not surprisingly, the wage premium for college graduates over high school graduates narrowed dramatically during the period.

Starting in 1980, the supply-demand picture flipped, the study shows. The rise in the supply of college-educated workers slowed to 2.00 percent per year while demand increased to somewhere between 3.27 to 3.66 percent

per year. That’s a major reason behind the rise in the premium back to the levels of 1915. “Overall, simple supply and demand specifications do a remarkable job explaining the long-run evolution of the college wage premium,” the authors write, with the exception of two periods.

The first is the 1940s, when the actual premium declined more sharply than pre-

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dicted. In all likelihood, the authors argue, the lingering effects of wartime wage policies, the bargaining power of industrial unions, strong wartime demand for production workers, and the postwar consumer boom all acted to narrow the premium below its long-term equilibrium level. (In the 1950s, the premium rebounded more strongly than predicted, apparently bringing the wages of skilled workers back into balance.)

In the mid- to late-1970s, the college wage premium narrowed again. Slowing productivity, high inflation, and oil-price shocks complicated the picture. Unions whose members had wages fully indexed to inflation and whose contracts provided real wage growth helped boost the income of non-college-educated workers. These “institutional” factors may have led, again, to the college premium narrowing more than supply-and-demand fundamentals would have warranted. The college premium rebounded dramatically in the 1980s after a deep recession and employers’ tougher line with unions led to concession bargaining in the early part of the decade.

The study finds similar supply-demand forces influencing the wage premium to high school graduation during the first part of the twentieth century. A jump in the number of high school graduates starting around 1910 marked the beginning of the decline in that premium that lasted until the 1940s.

The authors also examine what role immigration has played in the fall and rise of

the college wage premium since 1890. Since immigrants have tended to swell the ranks of less-educated workers, especially during the initial and latter parts of that period, their influx has had an impact. But “immigration had a far smaller effect on relative skill supplies in all periods we examine than is generally presumed and thus it had a smaller impact on changes in the premium to education than is often asserted,” the authors argue.

After 1980, for example, when there was a slowdown in the growth of the relative supply of college graduates, the decline in growth of the relative supply of native-born graduates accounted for 86 percent of the change. Thus, only 14 percent was due to immigrants. For high school graduates, the immigration effect was far more pronounced. But again, the slowdown in the growth of the supply of native-born high school graduates accounted for 57 percent of the effect, they calculate, while 43 percent of the effect was caused by immigration.

“Technological change is the engine of economic growth.” Yet, the authors conclude,

it also “creates winners and losers and can sometimes have adverse distributional consequences that may foment social tension.... [But] [i]f workers have flexible skills and if

the educational infrastructure expands sufficiently, then the supply of skills will increase as demand increases for them. Growth and the premium to skill will be balanced and the race

between technology and education will not be won by either side and prosperity will be widely shared.”

—Laurent Belsie

Higher U.S. Investment Yields Won't Allow Continued Large U.S. Current Account Deficit

Conventional wisdom holds that the United States consistently earns more on its foreign investments than foreigners earn on their U.S. investments—that is, that the United States enjoys a positive returns differential with the rest of the world. It is further believed that such a situation contributes to overall economic stability, or what has been called a “relatively benign continuation of global imbalances.” But a quite different view emerges in **The Stability of Large External Imbalances: The Role of Returns Differential** (NBER Working Paper No. 13074) by **Stephanie Curcuru, Tomas Dvorak, and Francis Warnock**.

Studying data from the Treasury International Capital Reporting System compiled between January 1994 and December 2005, a period of rapid financial globalization, Curcuru, Dvorak, and Warnock analyze the country and asset class composition of U.S. portfolio claims (U. S. investments abroad) and liabilities (foreign investments in the United States). By isolating composition, return, and timing effects, the researchers determine that essentially no positive differential exists for portfolio securities. That is to say, the positive and negative differentials that do appear from year to year balance themselves out, so that the average differential is virtually zero.

The researchers find a positive composition effect, as global equities had higher returns than bonds, U.S. investments favor equities, and U.S. liabilities are weighted toward debts. But this composition effect is offset by a negative return effect. The U.S. equity markets performed well over the last dozen years, while bond returns were essentially equal around the developed world. So, in sum, U.S. securities yielded higher returns than foreign securities. Given that the negative return effect almost exactly offsets the positive composition effect, the researchers say that it is surprising that they

find any return differential at all.

Their explanation for this is that investors in foreign countries, and especially in developed countries, have shown a lack of aptitude in shifting between U. S. bonds and equities. Curcuru, Dvorak, and Warnock find that foreigners tend to have a relatively high equity weight when U.S. equity prices have already peaked and a relatively low equity weight

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when U.S. equity prices are about to rise. This finding strongly suggests that foreign investors have exhibited poor timing in their portfolio decisions.

For example, in 1994 and 1995, U.S. equities outperformed U.S. bonds, so the buy-and-hold weight for January 1996 was considerably higher than the actual weight from January 1994 and the actual weight for January 1996. In fact, actual equity weights are lower than the buy-and-hold weights for most of the second half of the 1990s. Putting a low weight on U.S. equity during the late 1990s, the researchers point out, proved to be a poor decision, as U.S. equities performed spectacularly during that period. When U.S. equities peaked in early 2000, foreigners’ actual equity weights were higher than the buy-and-hold weights, indicating that foreign investors were buying stocks (or selling bonds), which proved profoundly unwise. The same kind of poor timing shows up yet again during 2003 and 2004. Curcuru, Dvorak, and Warnock estimate that foreign investors might well have improved their returns by 70 basis points per year had their timing in reallocating between stocks and bonds been better.

Understanding why foreign investors consistently fail to anticipate shifts in

relative returns on different classes of assets, the researchers say, is an important subject for future study. Factors like the accumulation of dollar reserves, or fluctuations in foreign currency values, do not seem to apply. It is important to know if the poor timing shown by foreign investors is more of a permanent phenomenon than a temporary one. “Should foreign investors improve their tim-

ing,” they write, “the U.S. external position would worsen at a faster pace. Our estimate of poor foreign timing is stable over our 12-year sample, but we have no confidence in its permanency. Increasing financial integration, cross-ownership of financial institutions, as well as improving information flows suggest that any skill advantage is unlikely to persist.” This means that the returns differential experienced by the United States would no longer be insignificant, but would in fact turn negative. U.S. investors therefore could no longer count on earning more on their foreign investments than they pay on their foreign liabilities.

Another area that needs analysis, the researchers add, is foreign investors’ reallocations within each asset class. The current assumption is that foreigners invest in market indices for both equity and bonds; that is, their allocations within each asset class matches that of the benchmark index for each asset class. But if over time foreign investors’ timing within asset classes is as poor as it seems to be between asset classes, then the true magnitude of timing and trading effects may well be underestimated.

—Matt Nesvisky

Parents Respond to School Performance Fact Sheets

Research on school choice suggests that parental choices have relatively large effects on outcomes, and that lower-income families attach less importance to academic quality. The question is whether these results reflect the true preferences of low-income parents or whether their relatively higher costs of acquiring information about school performance distort their choices.

After several years of running a school choice program, officials of the Charlotte-Mecklenburg School District (CMS) in North Carolina became concerned that children admitted to their parents' first choice alternative school often scored lower on subsequent academic achievement tests. The District allowed **Justine Hastings, Richard Van Weelden, and Jeffrey Weinstein** to conduct a field experiment to test whether simplified information on academic performance, and on the odds of admission to a particular school, would change parental behavior. The results of this experiment are reported in **Preferences, Information, and Parental Choice Behavior in Public School Choice** (NBER Working Paper No. 12995).

In the 2002–3 school year the District had begun its school choice program after a court order allowed it to cease the busing for racial integration that had been in effect for

three decades. By 2005–6, each student was assigned a “home school” and was eligible to enter lotteries for admission in up to three

“Parents who received the information sheets increased their participation in the choice program by 23 percent relative to those who did not get the sheets. The sheets also increased the likelihood that parents would bid for choice schools with higher average test scores.”

other “choice” schools that varied with student grade and location. The District maintained a Family Application Center to help parents with the choice process, and each family received a 100-page choice book. It included instructions for applying and descriptions of each of the almost 200 schools in the district. The descriptions did not include any objective measures of average school test score performance, suspension rates, or racial composition.

In consultation with the District, the authors designed simple information sheets to send to parents in randomly selected school-zones. Parents received either test score information or test score information along with information on the odds of admission for all of the choice schools in their zone. Results were tabulated separately for parents with children in failing schools. They had already been provided with a three-page printout of state

competency test scores for every school in the District as required under the No Child Left Behind Act (NCLB).

The researchers found that the simplified information sheets had no effect on the choices of parents who had already received information on school performance under NCLB requirements. They did have a relatively large effect on those parents who had not been receiving information on academic achievement. Parents who received the information sheets increased their participation in the choice program by 23 percent relative to those who did not get the sheets. The sheets also increased the likelihood that parents would bid for choice schools with higher average test scores. These results suggest that high information and decision costs may keep low-income families from acting on their preferences for academic excellence, and that school districts can help families benefit fully from school choice by taking simple steps to reduce those costs.

—Linda Gorman

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