
PLAY HERE
California Lottery
LOTTO

The *Real* California Lottery: Your Income Tax

by Jeffrey A. Dubin

The odds of winning in this game are significantly better.

The California Lottery lets you pay a dollar and pick six numbers between 1 and 53. If you guess all six correctly, you win a jackpot of up to several million dollars. Your odds of winning are about one in 23 million—not very good.

There is, however, another lottery that people in California play from time to time: cheating on their income taxes. The odds of winning in this game, the *real* California lottery, are significantly better. As demonstrated below, in order to "win" in the California tax lottery you must first not "lose" in the federal lottery. Today, the IRS audits roughly one percent of all individual tax returns filed. So the chances of getting away with a few omissions on a tax return—"winning"—are 99 out of 100. However, state income tax collection, including California's, is beginning to follow the federal model more closely. Since this includes adopting new enforcement strategies, the chances of "winning" may be changing.

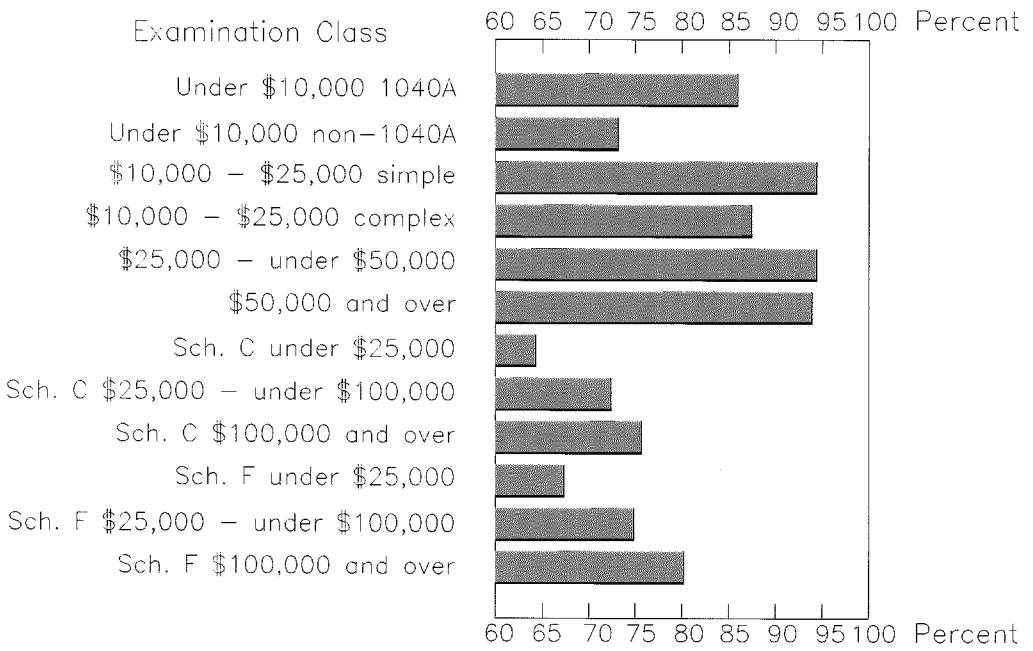
Dubin, looking for the best odds, ponders which lottery to play.

We all react differently to our tax responsibilities, and the pattern of noncompliance is far from uniform. Unlike playing the California Lottery, which is a game, playing the Tax Lottery is a crime. As with any crime, the Tax Lottery has two components. One is the probability of getting caught, and the other is the punishment if found guilty. The probability of getting caught is much lower now than it was ten years ago. However, if you are caught cheating today, the consequences are much more severe.

What happens to your tax return once you mail it away? In California, state tax returns go to the main office of the Franchise Tax Board (FTB), in Sacramento, where they are delivered in large bins. The contents of each bin are weighed and then dumped into machines that snip the tops off the envelopes. The machines put the envelopes and tops in one basket, and the returns in another. Then the principle of conservation of mass is applied: the two baskets are weighed and that weight is compared to the total weight received to make sure that nothing has been lost in the process.

The baskets of returns then go to temporary clerks who enter information from the returns into a computer. If every item from every return had to be entered, the data-entry process would take a very long time. (As it is, tax-entry season lasts about six months, and the FTB is one of the biggest employers of seasonal labor in the state.) Instead, only a limited number of items are extracted. These items, marked by bullets on the tax form, include wages, tips, and salaries, alimony payments, Schedule A itemized deductions, and charitable contributions. These bullet items are the only pieces of information used in the initial screening of the returns for potential audits. Items not used include moving expenses, exemption credits, Schedule C (sole-proprietorship income), and even such facts as whether your return was handwritten, typed, or prepared by a paid preparer. The logic behind the choice of information retained is sometimes difficult to understand. For example, information is recorded about payments to IRA accounts, but not to Keogh accounts.

Once this information is entered, the FTB checks the returns for arithmetic consistency; if



The percent of true tax liability actually reported varies widely, depending on individual income levels and the tax forms filed, as shown in this voluntary compliance level data from 1982. Schedule C, "Profit or Loss From Business," is filed by the self-employed. Schedule F is "Farm Income and Expenses."

any mistakes that cannot be corrected easily are found, the return is sent back to the taxpayer. If that were the end of the story, you'd think you had a simple strategy to win this lottery—accurately report the wages, tips, and other bullet items that are entered in the initial screening and don't worry about the rest.

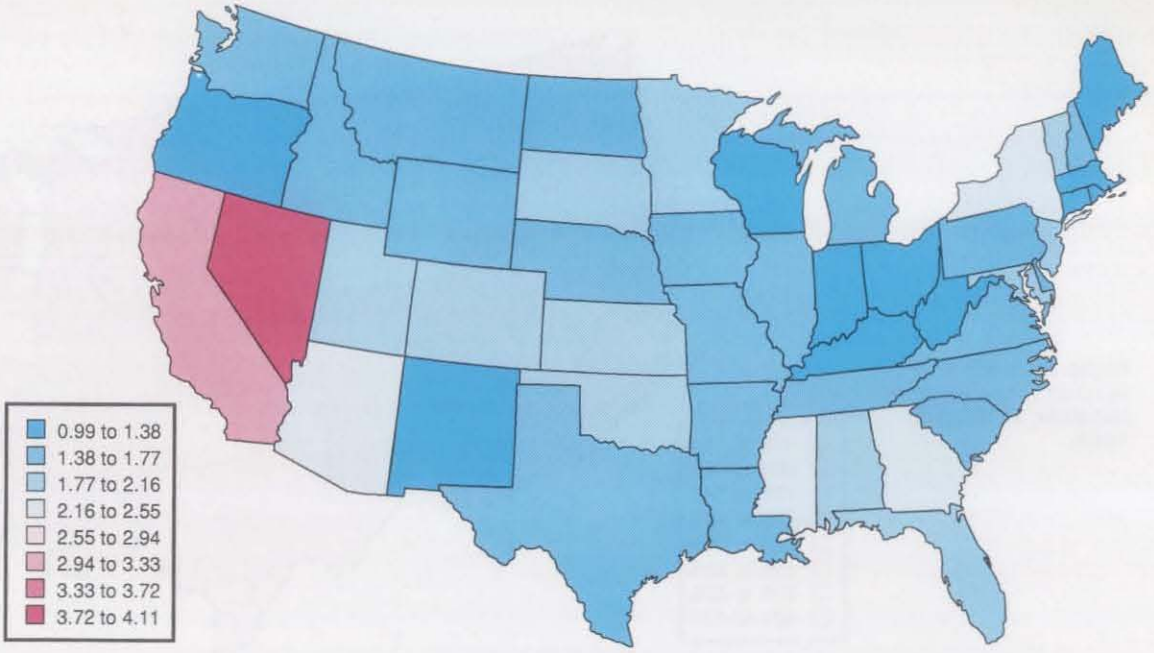
Unfortunately, this strategy is of limited utility, because all returns that meet some very broad criteria are earmarked for closer scrutiny. For example, all returns with wages, tips, and salary income that exceed a certain amount are put aside. This does not necessarily mean that these returns will be audited; rather that they will be looked at a little more carefully. After the year's worth of tax-return data is entered into the computer, it is put away for about three years. During this time the FTB awaits information from the IRS.

The United States Congress and the state legislatures have explicitly provided for the exchange of otherwise confidential tax-return and related information between the IRS and state tax agencies in order to avoid duplicate efforts and enforce tax compliance. The IRS and cooperating states now routinely synchronize certain audit decisions. Currently, nearly every state (and the District of Columbia) have agreed to coordinate tax information and audits with the IRS. There is, consequently, a direct linkage between the activities of state and federal tax agencies.

To better understand California's tax lottery, the federal audit process needs to be looked at in more detail. First of all, what is an audit? If the IRS (or FTB) discovers a discrepancy that can't easily be explained, the taxpayer is required to defend the information entered on the tax form. This is an audit. During an audit, which can take place by mail or in person, an auditor examines the return and supporting documents to determine the true tax liability. The burden is on the taxpayer to produce the evidence—receipts, canceled checks, and so forth—needed to support the information entered on the form.

One way the IRS selects returns for audit is based on the Taxpayer Compliance Measurement Program (TCMP). Every three years, the IRS audits some 50,000 lucky winners chosen at random from across the nation. These people have won the grand prize—a full-blown audit during which they must drag in all of their shoe boxes full of receipts. The IRS scrutinizes the tax return, line by line, and determines whether each item has been recorded accurately. The auditors then compare the amount that they believe is owed with the amount stated on the return. More often than not, the difference is in the IRS's favor.

Using the TCMP data from 1982, the IRS has calculated and made available statistics on the percentage of the true tax liability that was actually reported by taxpayers. In 1982, this level—the Voluntary Compliance Level—was estimated to be an average of 83.7 percent for all taxpayers. In other words, the average return underreported the taxpayer's true liability by 16.3 percent. Individuals filing Schedule Cs who reported less than $25,000 in gross receipts were relatively less compliant; but for those indi-



Percentage of tax returns audited by state, 1978. The maps accompanying this article were prepared with the assistance of Tom Boyce of the Campus Computing Organization.

viduals filing Form 1040 with under $10,000 of income, or Form 1040EZ (the simple, one-page tax form), the voluntary compliance level was significantly higher. This latter group, of course, has very few ways to cheat, since the employer withholds tax from each paycheck and reports the amounts directly to the IRS via W-2 forms.

The IRS also uses the TCMP to extrapolate individual noncompliance levels to the population as a whole. The most recent estimate is that approximately $90 billion in tax revenue due the government will go unpaid this year—up from $81 billion in 1981 and $29 billion in 1973. The IRS collected roughly a trillion dollars in individual income taxes last year; hence the "Tax Gap" is now about ten percent of total income-tax revenue.

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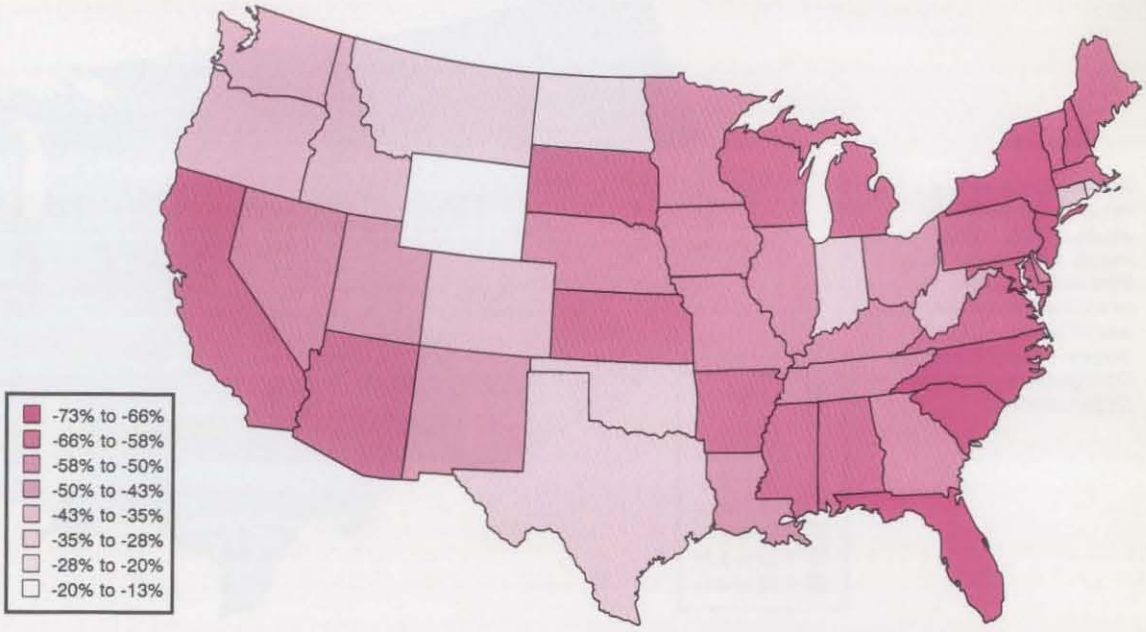
The TCMP estimate of the Tax Gap tends to fluctuate from year to year, depending to some extent on how it's put together. For example, the amount of tax cheating may actually have stayed constant from 1981 to 1986, but the examination protocols that uncover the true tax liability may have changed. And even when the IRS scrutinizes a return under the TCMP program, it's hard to sniff out some of the most effective dodges, such as the underreporting of income or the nonreporting of secondary income sources. The auditors can add up all the receipts and double-check the deductions, but if the income isn't in the records to begin with, it's very difficult to construct an audit trail.

As I mentioned above, the IRS uses information from the TCMP to develop an audit strategy. The agency correlates the individual's compliance level, as measured by the TCMP audit, with such characteristics of the individual's tax return as the amount of income reported and the pattern of deductions. This process produces a scoring rule that is then applied to all returns: low scores indicate relatively compliant returns and high scores relatively noncompliant returns. Within each IRS district—usually a state—the IRS ranks the returns by their TCMP-derived scores and audits those returns with the greatest potential yield first. This is a sensible strategy; auditors don't want to invest their limited time on people who aren't likely to owe them a worthwhile amount of money.

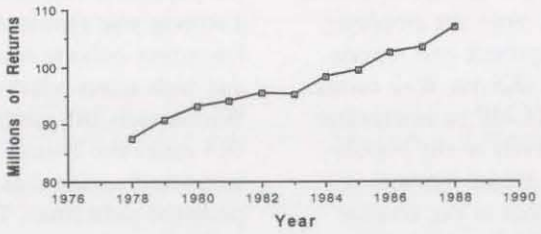
The fundamental issues of tax compliance are of great interest to economists, and to social scientists in general. When Louis Wilde, a professor of economics here at Caltech; Michael Graetz, the Hotchkiss Professor of Law at the Yale Law School; and I began to study the Tax Lottery, we decided to focus not on the Tax Gap, which isn't collected, but on the effect that audits and penalties have on what is. Does an increased threat of an audit actually increase collections? Our answer is that it does.

The above map shows the 1978 audit rate percentage by state. California and Nevada were being audited at a rate well above the national average. This makes sense for California because of the state's booming economy—the yields from these audits must have been fairly lucrative at the time. The reason why Nevada received so much attention is less evident.

There are relatively few people in Nevada, but there's a lot of gambling. In 1978, casinos



Right: Percent change in audit rates by state between 1978 and 1988.



Top: Number of returns filed. Middle: Percentage of returns audited. Bottom: Average penalty rate as a percentage of the tax owed. The IRS raised its penalty rate to compensate for the declining audit rate.

didn't report people's gambling winnings, so they were fairly easy to hide. One thing people like to do with their winnings is to purchase big-ticket items such as cars. Las Vegas, not surprisingly, has many car dealerships. People would just turn their cash into cars and drive away. However, these transactions are recorded at the dealerships and leave a perfect audit trail. The IRS caught on to this, and decided to watch Nevada more closely.

The nature of auditing has changed dramatically over time. The figures to the left are for the years 1978–1988. The number of returns filed grew rapidly—about 13 percent per year. The average population growth, however, was only about one percent per year; therefore, a large part of the increase in the number of returns filed can be attributed to changes in filing requirements. Although the number of returns filed has gone up, the percentage audited has fallen. In 1978, two out of every hundred returns were selected for examination. By 1988 the overall audit rate was half that, about one percent. The audit rate for the high-income population has fallen even faster. This rate was nearly 11 percent in 1979, but has decreased to just over two percent. (These audits, while based in part on the TCMP scoring rule, are not themselves the dreaded TCMP audits; unless the auditor discovers evidence of wider wrongdoing, these audits examine only those sections of the return that triggered the audit.)

In some states, the audit rate fell by as much as 70 percent, as the map above shows. California, Nevada, and the East Coast had the most

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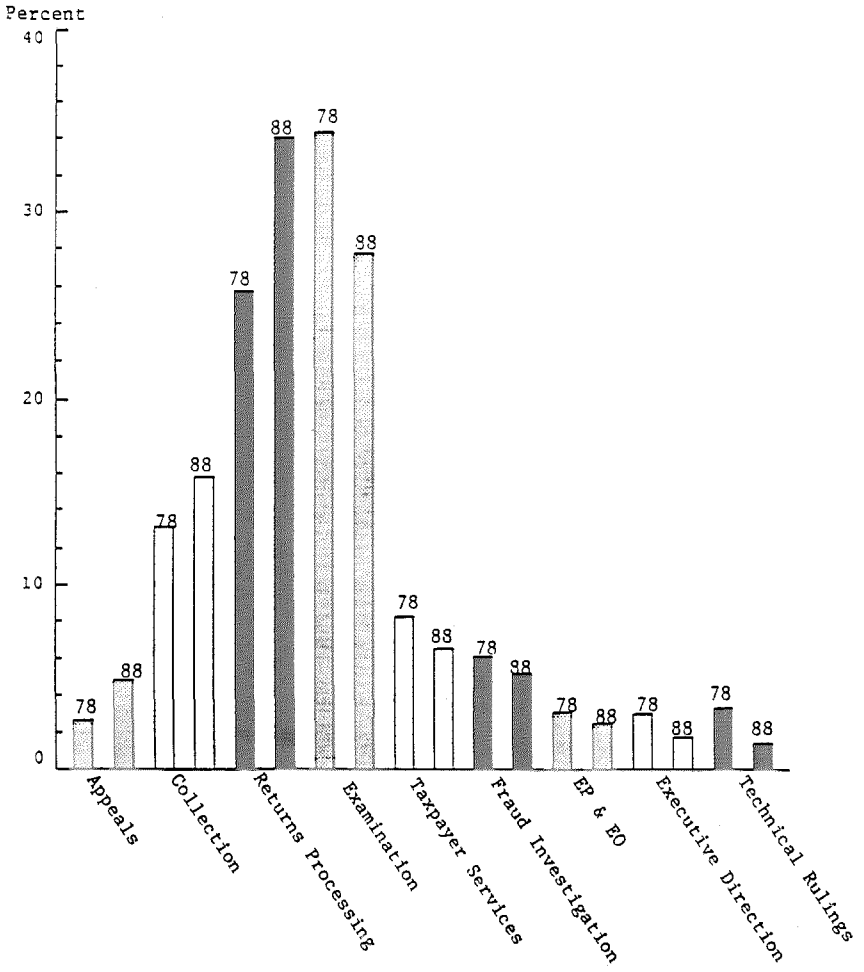
Below: Budget allocations as percentages of the IRS's total budget, 1978 and 1988.



significant decreases in audits, while in some states, such as Texas and Colorado, the rate declined less than the national average. California, which historically had a higher than average state audit rate, reached a slightly below-average rate by the end of the period. California had one of the fastest-growing populations during this period, so the fall in the audit rate was somewhat predictable. The IRS simply couldn't keep up. In Nevada, the significant decline in the audit rate can be attributed to simple changes in the law. Those same gambling winnings mentioned earlier are now tracked by "informational returns" issued by the casinos. The paper trail thus created removes the necessity for IRS field audits while maintaining the same, if not a better, compliance level. Texas, on the other hand, received increased attention from the IRS in an effort to crack down on abusive tax shelters, most notably oil and gas partnerships.

If the IRS isn't auditing individuals at the same rate they were a decade ago, what is it doing instead? It's not shifting to corporate audits—the picture is nearly the same for Subchapter S corporations and partnerships as it is for individuals. Audit rates have fallen significantly for all except the very largest corporations. The IRS is, in fact, doing three things differently. First, it is extensively computerizing its operations. Second, it is hoping that a stiff increase in penalties will compensate for declining audit rates. Third, it is doing criminal investigations for other agencies.

We compared the IRS's 1978 and 1988 budgets, and found that more money was being spent on computer processing—money that had previously financed audits. The use of good, old-fashioned, face-to-face auditing has clearly fallen off, to be replaced in large part by the use of third-party reporting and computerized technology. This is an example of the classic labor–capital tradeoff—computers with green eyeshades have replaced their human counterparts.

This new emphasis on computing puts the IRS and the FTB in a better position to gather more information about you. More documents—informational returns—are being filed in conjunction with your return. In the past, an average of six documents, including W-2s, were filed on your behalf by third parties. By 1988, that number had increased to about eight. Computers are able to digest this information and detect possible discrepancies. As a result, the IRS can take the discretion out of your hands. For example, if you choose not to report

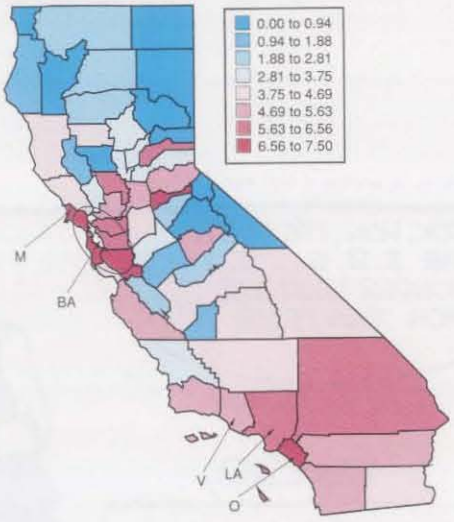
Computers with green eyeshades have replaced their human counterparts.

interest income from a smaller bank account one year, the authorities are now more likely to discover the omission. In fact, the IRS now processes almost 98 percent of the informational returns that are filed on your behalf.

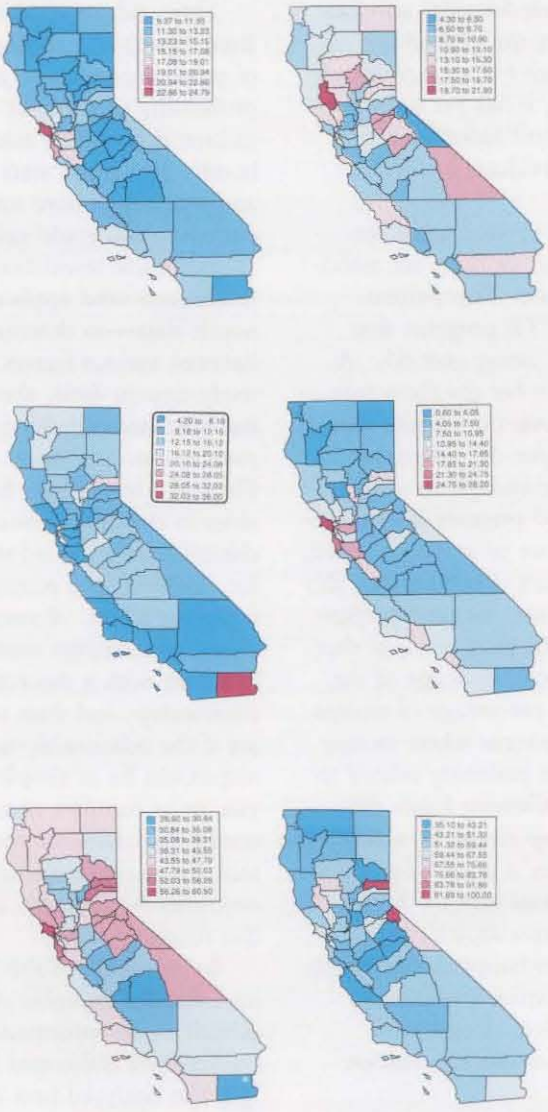
The government apparently believes that there exists a trade-off between auditing and penalties. Alarmed by the growing Tax Gap, Congress feared that the United States was becoming a nation of tax cheaters. Starting in 1981, legislation was passed to make the penalties for tax evasion more severe. Formerly, a common tax-evasion strategy was to pay your taxes late. Since interest rates in the marketplace were higher than the IRS's statutory rates, an opportunity existed to pocket the difference until the IRS forced you to pay, without even assessing a penalty. Now there are strict penalties for late filing and that loophole is closed. There is no empirical evidence as yet, however, to support the notion that stricter penalties deter other forms of noncompliance.

The IRS has always conducted criminal investigations. Historically, about 30 percent of these investigations started as a result of audits. This percentage has dramatically declined, as has the percentage of prosecutions resulting from these examinations. Nowadays, IRS resources are frequently borrowed by other agencies to aid in the prosecution of suspected criminals. When the Drug Enforcement Administration prosecutes a kingpin under RICO (the Racketeer-Influenced and Corrupt Organizations Act), it attempts to assemble as much evidence as possible. The IRS frequently provides both additional supporting evidence and "forensic" accounting expertise. As a result, the agency is often torn between noncompliance and other kinds of criminal investigations, and may be paying less attention to individual taxpayers.

Taken together, the picture that emerges is one of a more sophisticated and more efficient IRS, but also an IRS that has turned somewhat away from the traditional audit. The fall in federal audit rates coupled with the general reliance of states on information provided by the IRS might lead us to conclude that California has simply mirrored the federal pattern. On the other hand, California policy, while influenced by the federal model, may react differently to the underlying pattern of noncompliance within the state. The IRS is not very forthcoming about its audit policies. The federal audit-selection rule is probably among the government's most closely guarded secrets. Fortunately, the FTB has been more cooperative about providing information, making it possible to exam-



You could stare at these maps for a while and you might have some success discerning the pattern. You could just as easily go blind.

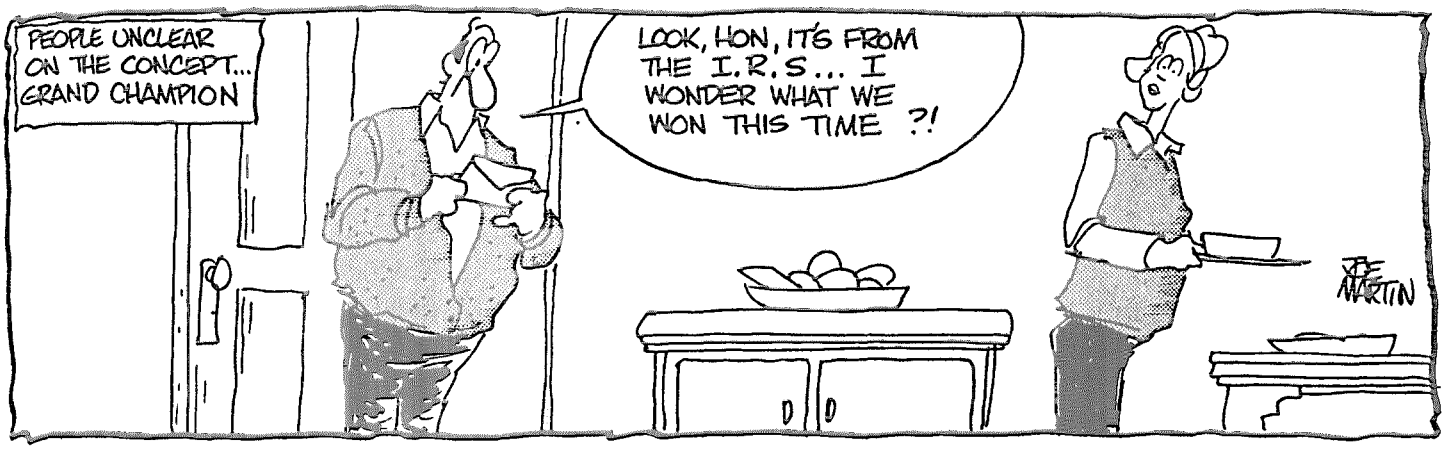


Above: Notice of Proposed Assessment rates (percent). M, BA, V, LA, and O stand for Marin County, the Bay Area, Ventura County, Los Angeles County, and Orange County, respectively.
Left-hand column, from the top down: personal income (thousands of dollars), unemployment rate (percent), and high-school education (percent).
Right-hand column: population over 65 (percent), offsetting losses (percent), and use of paid preparers (percent).
The two red counties on the paid preparers map are "outliers"—statistical artifacts caused by the small sample size.
All figures are per-county averages based on FTB data for 1984, except for high-school education, which is based on 1980 census data.

ine its tax policy a little more closely.

The larger map shows that the FTB gives Los Angeles County a lot of audit attention, but that the farm areas receive relatively little. The Bay Area receives significant audit coverage, as indicated by the dark red areas. Orange County also shows significant audit activity relative to the rest of the state. (This figure actually shows the percentage of returns that received a "Notice of Proposed Assessment." These notices are issued by the FTB as a result of its audit program, an IRS audit reported to the FTB, or a special FTB program to locate people who don't file their tax returns.)

We have found several correlations between taxpayer demographics, characteristics of individual returns, and the state audit rate. The small maps display some of these correlated factors. Areas in which personal income is higher tend to be audited more. Personal income is relatively high in Orange County, around the Bay Area, and in Marin county, and these regions have a correspondingly high audit rate. By contrast, unemployment rates have a negative effect on the audit rate. The yield from auditing in areas with high unemployment is generally not very good. High-school education is also negatively correlated with the audit rate. (Unfortunately, as few as one in four adults in the farm areas have high-school educations. Even in Marin County, the figure is only about 60 percent. As an educator, this map really gave me pause when I first drew it.) Why do people with higher levels of education receive fewer audits? One theory is that better-educated people are simply harder to



I'm not suggesting that you should cheat on your taxes, or rush out and buy a lottery ticket. If I had to gamble, I'd place my money on the FTB and the IRS.

catch—they can conceal their financial activities better. Another is that they understand the tax code better and can therefore file a more compliant return. (In this regard, it has yet to be determined whether the recent federal tax "simplification" has led individuals to file more compliant returns.)

Areas in which a larger percentage of the population is 65 years of age or older are associated with more audit activity. This pattern might be due to a special FTB program that monitors the exemption for being over 65. A 64-year-old filling out his or her tax form may think, "If I got into the movie on a senior discount last week, why not take the exemption?" This extra year may now be enough to trigger an audit. The use of a paid preparer is negatively associated with your chance of getting audited, at least in California. We are uncertain why this is so. Perhaps returns prepared by paid preparers are more compliant at the state level, in that the preparers have a detailed knowledge of the tax laws. And, finally, the percentage of returns showing offsetting losses—returns where income has been offset by losses—is positively related to county-level audit rates. Offsetting losses can occur if you file a partnership return in which this year's income is offset by a greater loss carried forward from the previous year, or if you file a sole-proprietorship return showing more expenses than receipts. It so happens that people in Marin show a lot of offsetting losses, as do Ventura and Orange Counties. These areas receive correspondingly greater audit attention from the FTB.

How did we combine these seemingly unrelated factors and conclude that the increased use of paid preparers is negatively associated with the probability of an audit while increased personal income is positively associated with this likelihood? You could stare at these maps for a while and you might have some success discerning the pattern. You could just as easily go blind.

Economic researchers today use econometric techniques—the application of statistics to economic data—to determine the relationship between various factors. Econometrics is a relatively nascent field, about 60 years old, but it has been successfully applied to many different problems and in many different disciplines. Physical scientists can frequently control the variables in their experiments, working with pure chemicals at standard temperature and pressure, for example. An economist's laboratory is necessarily the world. Econometrics tries to discern causal relationships among uncontrollable factors. We start with a theoretical model that predicts a relationship, and then test the observed data to see if the relationship holds. The statistical techniques can be as simple as linear-regression analysis, or as complex as simultaneous equation systems, nonparametric methods, or methods that seek to maximize the likelihood of the observed outcomes from within a specified class of alternative models.

In our study of the Tax Lottery, we examined the demographic characteristics of the filer as well as the information filed to explain county-level differences in the state audit rate. We also analyzed how the amount of tax col-

lected changed over time in response to the audit rate, while controlling for a variety of other factors that had also changed. The tricky part is that, when the audit rate increases, collections should increase as people become more compliant. The IRS, however, is not an innocent bystander—it raises audit rates when collections fall because that's how the missing money is retrieved. Just looking at the data on collections and audits doesn't show which force is the driving one. Econometrics helped us to separate the effect of audits on individual behavior from the effect of IRS behavior on audits. This analysis enabled us to demonstrate that increased audit coverage caused increased compliance.

The average taxpayer spends from four to ten hours a year preparing tax forms.

A back-of-the-envelope calculation shows that a dollar spent on the Tax Lottery is a pretty good bet. If you attempt to cheat California out of a dollar in taxes, you get to keep about 80 cents of that dollar on the average. The California Lottery works just the opposite—a dollar spent is, on average, 80 cents thrown away. (The California Lottery isn't even a fair bet, for several reasons: taxes are collected on gambling winnings, a fraction of every dollar spent on the lottery is appropriated to the school system, and the payout scheme doles out large winnings in annual installments rather than as a lump sum up front.) I'm not suggesting that you should cheat on your taxes, or rush out and buy a lottery ticket. If I had to gamble, I'd place my money on the FTB and the IRS. Every dollar they spend on enforcement results in a $14 gain. This statistic is fairly uniform across income classes and holds for both corporations and individuals.

In the future, there will likely be a decrease in the $90 billion of uncollected taxes. There's a wealth of information on taxpayers that the IRS and the FTB have not even attempted to use. But they're becoming more sophisticated and their computers are getting faster. Many paid preparers and national tax-preparation services now file tax returns magnetically. With the entire return in machine-readable form, tax agencies can easily examine a greater number of tax-return items, which should improve the audit-selection process. It's also likely that the tax authorities will be able to trace an individual's tax-return information over time. Incredibly, very little of that currently takes place. For example, I've not seen any evidence that your past audit history influences your current likelihood of an audit. The information simply is not retained. As for the guy who seems to get audited year after year, it could be that he just consistently files a return that produces a big TCMP score, and is therefore subject to an increased chance of being audited.

The California tax return has recently been brought into close correspondence with the federal tax return. There should, therefore, be fewer opportunities for tax evasion as the differential treatment of deductions, exemptions, credits, and the like disappear. More and more states are taking their income tax as a percentage of the federal one, and that's not a bad idea. The average taxpayer spends from four to ten hours a year preparing tax forms—a dead-weight loss on the order of $25 billion annually if those hours had been spent in gainful employment.

It seems that as long as we conduct our commerce in cash, there will be opportunities for tax cheating. If we switch to a debit society—do all of our transactions electronically—and get rid of cash altogether, I think we could eliminate non-compliance completely. Interestingly enough, no one seems to want that. People don't want a record kept of their activities. Cash is being used more now than ever before.

Although computer technology and information-matching have made the IRS and FTB more efficient, auditing remains their most powerful enforcement tool. As long as the Tax Lottery remains a game of chance, one thing is certain: let the audit rate fall, and more people are encouraged to play the Tax Lottery. □

Jeffrey Dubin came to Caltech as an assistant professor of economics in 1982 and became an associate professor in 1988. He received his AB from UC Berkeley in 1978, and his PhD from MIT in 1982. His research focuses on micro-economic modeling, particularly on discrete-choice econometrics, which is the study of how individuals choose from among a limited set of alternatives—deciding how to vote, for example, or what model car to buy. Besides tax compliance, he has published articles on such topics as risk assessment and nuclear energy, energy-demand forecasting, rate-structure design, the effects of welfare and entitlement programs on unemployment, and a book, Consumer Durable Choices and the Demand for Electricity. *This article, based on a Seminar Day talk, is Dubin's first contribution to* E&S.

The FTB gave Dubin special access to their computer system to gather many of the statistics needed for this research. While on the computer, he pulled up his own return for curiosity's sake, and discovered that he had been assessed a penalty. He swears that it had nothing to do with tax evasion.