Research Digest

The Region often includes one or two articles about economists at the Minneapolis Fed and their current work. Research Digest is a new *Region* feature that provides shorter summaries of recent economic research papers.

In this issue, the Digest discusses work by Fatih Guvenen and colleagues on the interplay of tax policies, wages and incentives to increase human capital; and by James Schmitz and his co-authors on how cartels can diminish productivity.

Taxes, Wages and Human Capital

Progressive tax policies decrease before-tax wage inequality, suggests research by Fatih Guvenen and colleagues, by diminishing motivation to acquire higher education and job skills.

If a country adopts tax policies with the aim of reducing economic inequality, might that policy unintentionally undermine other policy objectives like widespread higher education and better job training? Indeed, can efforts to reduce inequality result in lower GDP—an actual decline in economic well-being? More broadly, what determines wage dispersion in modern economies, and how do those determinants interact with technological progress and government policies?

These are the questions addressed by Minneapolis Fed visiting scholar Fatih Guvenen and colleagues in Staff Report 438, "Taxation of Human Capital and Wage Inequality: A Cross-Country Analysis." Their answer, in a nutshell: "Government policies can strongly influence the response of an economy to technological change by distorting individuals' incentives to undertake human capital investment, which keeps inequality low but at the cost of lower aggregate output."

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U.S.-European comparisons

Guvenen, with Burhanettin Kuruscu and Serdar Ozkan, analyzes wage trends to understand why wage inequality in the United States is substantially higher

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An article on Fatih Guvenen's work on the equity premium puzzle appeared in the December 2009 *Region.*

than in Europe and why the U.S.-European differential increased from 1980 to 2003. Their focus is on the impact of labor income taxes on determinants of wage inequality, especially on individuals' incentives to build human capital.

They begin by presenting some data. Averages for 1978-1982 show that wages at the 90th percentile in the United States were 3.8 times higher than those at the bottom 10th percentile, while in six European countries, the 90/10 ratio was 2.5. Two and a half decades later (2001-2005), wage inequality had jumped in the United States to a 90/10 ratio of 4.8, while the European inequality ratio was a modestly higher 2.7. In sum, U.S. wage inequality was higher and growing faster than in Europe.

There are many possible explanations for these trends, note the economists. Some of them, such as labor union activity and minimum wage laws, are likely to be most relevant for the lower end of wage distribution. But in recent years, they point out, most of the rise in wage inequality has appeared in the upper end of the distribution, suggesting that human capital plays a significant role. That observation motivates their focus on progressive taxation and human capital.

Taxes and inequality

Their first step is to document two empirical facts relating tax policies and inequality in the United States and Europe over recent decades.

Number one: They show that countries with more progressive tax schedules—meaning the tax rate is higher on higher wages—have significantly lower *before*-tax wage inequality. That is, even prior to taxes being taken out of paychecks, the high-to-low wage ratio is much lower in countries where tax schedules put a bigger bite on the rich. So in Finland, for instance, which has a very progressive tax schedule, the 90/10 ratio for wages before taxes is lower than in the United Kingdom, which doesn't tax higher wage earners so heavily compared with lower wage earners.

Number two: They document that progressivity in tax schedules is also negatively correlated with increases over time in wage inequality. So, in Finland and Sweden, both with very progressive tax rates, wage inequality grew more slowly from 1980 to 2003 than it did in the United States or United Kingdom, with far less progressive schedules.

Why would tax rates have an impact on wage inequality before taxes are even taken out of those wages? The economists focus on incentives to acquire human capital; in other words, they investigate whether workers facing a progressive tax schedule might realize they'll take home less of their wages if they earn more, and so make less of an effort to raise their earnings potential through more education or job training.

The economists then build a model of individual decision making. An individual can decide at each point in time—given wages, taxes, schooling costs and so on—whether to go to school, work at a job or be unemployed. They'll acquire skills in school or while working and thereby raise their earnings potential, but wage inequality can arise because people

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differ in their ability to acquire new skills. In this model, individuals make a decision about what to do (school, work or unemployment) that's affected by wage tax schedules.

If after-tax earnings will be reduced by progressive tax rates, suggests the economists' model, individuals will be less motivated to earn more and therefore less motivated to acquire skills that raise their pay. "Progressive taxation compresses the (after-tax) wage structure, thereby distorting the incentives to accumulate human capital," write the economists. And that leads to the relationship found in the data: a negative correlation between progressivity and before-tax wage inequality.

Matching the data

And indeed, their model (which also incorporates national unemployment insurance and pension systems, as well as idiosyncratic shocks to worker efficiency) does a good job of matching the data, particularly at the high end of the earnings scale. Recall the economists' data showing that U.S. wage inequality was substantially higher than in European nations, especially in 2001-2005. The model generates a high U.S.-European inequality differential, too, accounting for about half of the difference found in the data. When focusing on inequality among higher wage earners (the 90/50 ratio as opposed to the 90/10 ratio), the model explains over three-quarters of the U.S.-European difference. This makes sense, say the economists, since taxes are likely to have their greatest impact on those who have acquired higher human capital. In contrast, institutions such as labor unions are likely to have a greater impact on wage differentials at the lower end of the wage distribution.

The model also does a reasonable job in explaining *trends* in wage inequality. Modeling for "skill-biased technological change"—that is, changes in workplace technology that raise earnings for those with higher skills such as computer literacy or management—the economists are able to generate trends similar to those seen in reality. Their model explains over 40 percent of the U.S.-European difference in rising wage inequality and nearly 60 percent of the difference at the higher end of the earnings scale.

Finally, the economists look at inequality trends when technology and tax progressivity both change. Focusing on Germany and the United States, they estimate that decreased U.S. progressivity in wage taxation during the 1980s and '90s explains a very large part of the increase in inequality over that period, and technology changes a far smaller portion. This observation is timely, given current debate about whether to increase progressivity in the U.S. tax schedule.

"The mechanisms studied … provide a promising direction for understanding [U.S.-European] differences in wage inequality," conclude the economists. "The most important policy difference for wage inequality is the progressivity of the income tax system, which is responsible for about two-thirds of the model's explanatory power. In addition, endogenous labor supply plays an important amplification role for wage inequality when interacted with progressivity."

—Douglas Clement