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## ECONOMIC RESEARCH AND DATA

### FRBSF Economic Letter

**2006-33-34; December 1, 2006**

#### Economic Inequality in the United States

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*This Economic Letter is adapted from the 2006-2007 Economics of Governance Lecture delivered by Janet L. Yellen, president and CEO of the Federal Reserve Bank of San Francisco, at the Center for the Study of Democracy, University of California, Irvine, on November 6, 2006.*

My topic today is the performance of the U.S. economy, with a focus on how trends for the economy as a whole have been playing out for our nation's individuals and families. One area I'd like to examine in particular is how the income that has been generated by our economy over the past three decades or so has been distributed among the various income groups, from the top to the bottom.

Questions of income inequality, of course, are not part of the Federal Reserve's dual mandate from Congress, which is to foster price stability and to promote maximum sustainable employment. Nonetheless, this has been an interest of mine for a long time, and not only as an academic. In addition to my years as an economics professor at U.C. Berkeley, I've also had several stints as a macro policymaker, first on the Federal Reserve Board in Washington, D.C., then on President Clinton's Council of Economic Advisers, and now at the Federal Reserve Bank of San Francisco. Much of my interest in macro policy has been founded on the belief that it can and should improve the lives of the broad range of our nation's people. I think of this as happening through two channels. First, policies that reduce the frequency and size of the fluctuations in business cycles can spare people the painful disruptions that occur during recessions, or, in the worst cases, tragic events like the Great Depression of the 1930s. Second, policies that succeed in enhancing the long-run growth of productivity should help lift the average standard of living over time.

By many measures, these two channels have been operating extremely well in our economy for some time. In terms of the business cycle, for almost two decades we have been enjoying an era that many economists call the "Great Moderation"; in other words, recessions have been less frequent, and the swings have been less severe, while, at the same time, inflation has come down to quite moderate levels and itself has been less volatile. Productivity trends also have been very favorable, probably in no small part because of the impact of technological advancements. Growth in labor productivity has been quite rapid for over ten years now, following more than a quarter century of stagnation that began in the early 1970s.

Given these two developments—more macro stability and more rapid labor productivity

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growth—it is tempting to conclude that most Americans are feeling “better off.” But a glance at the newspapers suggests that this is not necessarily the case. Indeed, poll after poll shows that many Americans feel dissatisfied with the long-term direction of the economy and are worried about the future. Recent polls by the Pew Charitable Trust, the *New York Times* and CBS News, and various labor organizations indicate that growing shares of respondents feel that they and their children will experience a diminished quality of life in coming years, and that, even today, working conditions are marked by more insecurity and stress than they were a generation ago (see, e.g., Greenhouse 2006).

Looking beyond the headline numbers on the macro economy provides some clues to the source of this discomfort. In particular, over the past three decades, much of the gain from excellent macroeconomic performance has gone to just a small segment of the population—those already in the upper part of the distribution. As a result, inequality has grown. This inequality, coupled with increased turbulence in family incomes associated with job displacement and restructuring, sheds substantial light on the sources of the disappointment and concern that show up in the opinion polls.

Today I'd like to examine these trends in a bit more detail. I will start with a more thorough review of the facts relating to economic inequality and an assessment of some of the leading explanations that have been advanced. Then I will broaden my perspective to consider other sources of unease, namely, job displacement and income volatility. Finally, I will turn to some policy considerations.

### Productivity and real wages

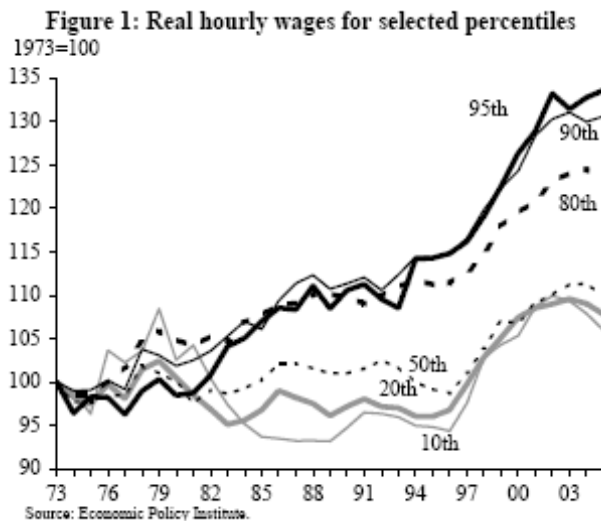
A natural place to begin is by looking at average real compensation, that is, average wages plus benefits for an hour of work adjusted for inflation. In the U.S., the growth in average real compensation has roughly tracked growth in labor productivity, which measures the value of output per hour of work adjusted for inflation. When U.S. labor productivity growth slowed sharply and unexpectedly in the early 1970s and then stayed sluggish<sup>1</sup> for the next 25 years, growth in average real compensation also was sluggish.

Then, in the mid-1990s, labor productivity growth surprised us again, only this time, thankfully, on the upside: it suddenly took a big jump up—to over 3% at an annual rate—and it has stayed in that vicinity ever since. As I mentioned, this development probably stemmed mainly from technological innovations and the huge investments businesses made to harness them for production. How has this affected average real compensation growth? It has jumped, too, also hitting a 3% rate.<sup>2</sup>

From this perspective, then, it would seem that things are looking pretty good. However, the public mood does not seem consistent with this view. To see why, we need to dig a little deeper. When we look at data on the distribution of real wages, which constitute the bulk of compensation, we find striking evidence of increasing inequality. For example, economists Dew-Becker and Gordon (2005) report that, from 1997 to 2001, nearly 50% of productivity gains went to the top 10% of the distribution. Importantly, they find roughly the same pattern going back more than 30 years.

### Wage inequality

As Figure 1 shows, from 1973 to 2005, real hourly wages of those in the 90th percentile—where most people have college or advanced degrees—rose by 30% or more. As I will discuss later, among this top 10%, the growth was heavily concentrated at the very tip of the top, that is, the top 1% (Piketty and Saez 2006). This includes the people who earn the very highest salaries in the U.S. economy, like sports and entertainment stars, investment bankers and venture capitalists, corporate attorneys, and CEOs. In contrast, at the 50th percentile and below—where many people have at most a high school diploma—real wages rose by only 5% to

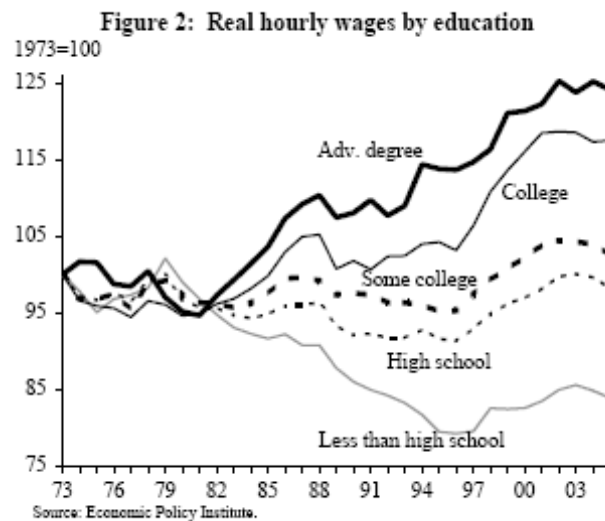


10%.<sup>3</sup>

What I've described so far is the big picture for wage inequality—the major change over three decades. However, an interesting twist on the story has occurred during the last decade, when rapid productivity growth raised the real wages of workers throughout the distribution for the first time since the 1960s. During this period, real wages of the lowest earners—the 10th percentile—actually rose somewhat faster than those in the middle of the distribution. The consequence was that wage inequality among those in the bottom half of the distribution, which had been widening throughout the 1980s, diminished during the 1990s. At the same time, real wages at the upper end continued to soar.<sup>4</sup>

### What explains the rising economic inequality?

Although there are a variety of ways to explain trends in wage inequality, perhaps no cut at the data has been more revealing than the differences in real wages by education. As Figure 2 shows, since the early 1980s, the wage gap between college graduates and those with a high school education or less has widened dramatically; the gap between high school graduates and non-graduates also has widened, but less so. Thus it appears that the demand for college educated workers has outstripped the supply. While rising returns to education at the upper end of the distribution led to a pickup in college enrollment, the increase in supply has not been sufficient to reduce the wage gap between college and high school educated workers.



It's important to recognize, however, that shifts in the return to education and the educational attainment of the workforce cannot fully explain the evolution of inequality over the last 30 years because, even within groups with the same level of education, the gap between high and low earners has widened, too. Indeed, the more advanced the degree, the wider the gap becomes. A satisfactory theory must therefore explain not only why the demand for college educated workers has risen but also why "residual" inequality has increased, that is, the part that is unexplained by education and other observable factors.

A primary explanation has focused on the impact of technology. Over the past three decades, many sectors of the economy have undergone fundamental change as a result of technological advancement, most notably the enormous investments in computers and related technologies. These technologies have changed what workers need to know to do their work, and, indeed, they have changed the nature of the work itself. As a result, there is a greater demand for, and a greater payoff to, workers who have the conceptual and organizational skills to use these technologies most effectively. The necessary skills are more prevalent among college educated workers, so they are in greater demand. However, even among workers with equal educational attainment, skills differ.

For example, consider two college graduates with liberal arts degrees: the one who has the skills to use computer power to collect, analyze, and synthesize data may have a distinct edge in the labor market over the other who lacks those skills. Similarly, a machinist with a high school diploma who can use computers effectively will tend to earn more than a coworker who is a technophobe.

This explanation is summed up in the literature by the term "skill-biased technological change." It explains the increased demand for and rising wages of highly educated workers and also rising "residual" inequality, because skill differences exist not only across but also within educational groupings. These skill differences are observed by employers and rewarded in the marketplace, but unobservable to researchers.

A related factor accounting for rising inequality is the increasing globalization of labor markets. The most basic way in which globalization might affect inequality is through trade, which has raised substantially both imports and exports as a share of GDP. Since the U.S. tends to export goods that use skilled labor intensively and to import goods that use less-skilled labor intensively, increased trade has, on balance, raised the demand for skilled labor and reduced the demand for less-skilled workers in this country. In the 1980s, the impact of globalization was especially pronounced for previously well-paid manufacturing jobs available to U.S. workers with a high school degree or less. The result has been job losses and excess supply of less-skilled workers, a situation that has been intensified by an influx of immigrants with less than a high school education.

Certainly, globalization has been a factor in the downsizing of several industries that employ less-skilled workers—apparel is a good example. And it may account for part of the increase in inequality over the last 30 years. But it surely can't be the whole story because, for much of this time, the shift in employment toward an increasingly skilled workforce has occurred across a wide range of industries, whether they were affected by global trade or not. The logical conclusion is that skill-biased technological change has been a dominant force across the industrial spectrum.

In recent years, globalization and skill-biased technological change may have been working in combination to particularly depress the wage gains of those in the middle of the U.S. wage distribution, accounting for the twist in the trend that I mentioned earlier. The explanation goes like this. The surge in the use of new technologies that began in the mid-1990s led to major changes in the way business was conducted and organized within the U.S. and globally. Technological change and globalization, especially outsourcing, complemented the skills of highly able workers performing non-routine work requiring problem-solving skills. This explains the continued rapid increase in real wages at the top of the distribution. In the middle of the distribution, however, technology and globalization had the opposite effect—substituting for workers performing routine or repetitive tasks and depressing their wages. At the bottom of the distribution, these developments have had little impact during the last decade. By that time, many low-wage jobs that could be eliminated by technology had already vanished. Most of the remaining low-wage jobs involve manual and service work that cannot easily be automated. This may explain why, as I said, wages in the middle not only rose far more slowly than those at the top, they also rose more slowly than those at the bottom of the distribution during the 1990s.

Let me elaborate with an example from the technology side. Take the accounting profession. Computers and telecommunications technologies have increased wages for accountants, who tend to be at the top end of the distribution. In contrast, in the middle of the distribution are workers like bookkeepers, who are being replaced by technology. At the lower end, the labor market has already largely adjusted to the impact of skill-biased technological change. Therefore, the wages of those workers, who perform manual tasks in sectors like business services—janitorial work is an example—are now largely untouched by computers (see, e.g., Autor et al. 2006 and Autor et al. 2003).

Globalization in combination with advances in technology, especially communications technology, leads to similar patterns. At the upper end, it has boosted demand for those who have the skills to manage large, complex, global operations. In contrast, an increasing share of domestic jobs in the middle of the wage spectrum has experienced lower demand because companies can now look all over the world for workers able to perform computer programming tasks, communications tasks, and similar jobs—even medical services. At the same time, such outsourcing is far less feasible for manual jobs and for service jobs that require face-to-face interactions and lie at the low end of the wage distribution.

These changes in technology and growing globalization go a long way towards explaining the inequality trends I have described. And there certainly are other factors that have also likely played a role. For example, the fall in the real value of the minimum wage appears to have especially depressed the wages of less-skilled women, while declines in unionization particularly impacted the wages of less-skilled men. However, none of these factors provides a complete and compelling explanation for the rapid growth of real wages at the very top of the distribution, the top 1%, which, according to IRS data, doubled between 1972 and 2001.<sup>5</sup>

The market forces of changing technology and rising globalization, broadly understood, may matter to some degree for this group. For example, these forces have substantially increased the size of the markets that American companies serve. This has, in turn, increased the impact of individuals who are at the very top end of the talent and skill distributions—and who tend to be in very short supply. These individuals include so-called superstars, such as top entertainers and athletes, highly successful investment bankers and venture capitalists, and perhaps CEOs, although the latter point is hotly debated. For

example, people had a high demand to see Michael Jordan perform—far higher than the demand for even a large number of average NBA players—and technology enabled his performances to be broadcast to a very large worldwide audience at relatively low cost. It's not surprising that he, and other superstars, could earn very large incomes (Rosen 1981).

The superstar argument is less clear-cut with CEO salaries, in part because a CEO's contribution to the bottom line of a corporation is difficult to measure. Some argue that CEO compensation has been driven up by market forces, like the large increase in the size of many American companies, which increases the potential benefit of hiring the right CEO from the limited pool of candidates (Gabaix and Landier 2006).

Another possible explanation is the so-called "tournament" model, in which the CEO's direct contribution to the bottom line is not so much of an issue. This model suggests that large pay differentials for those at the top of an organization function as incentives for lower-ranked executives to compete for those positions, in other words, to work harder in order to win the top spots themselves one day. The resulting increase in effort generates benefits for the company that go well beyond the direct contribution made by the CEO (Lazear and Rosen 1981).

While such competitive factors may matter, I cannot ignore the concerns that have been raised of late regarding corporate standards for executive pay-setting. Some observers have argued that corporate boards are increasingly beholden to the CEOs whose salaries they determine; as a result, CEO salaries may be inadequately monitored and sometimes set higher than market conditions or company performance merits. Critics of rising executive compensation also have pointed to inappropriate reliance on compensation schemes that hide payments from shareholders and the market—for example, the backdating of stock options for top executives, which increases executive payouts without properly reflecting the resulting costs in corporate balance sheets.

The hidden nature of these payouts may reflect an imbalance in the setting of executive pay relative to shareholder returns and worker pay more generally. Issues like these quite naturally raise concerns for the public and contribute to feelings of dissatisfaction.

### **Job displacement and income instability**

Another contributor to feelings of discontent is the perception that job stability has declined. Globalization and technology appear to have played roles in these trends as well, since they represent changing market conditions that are causing dislocations in previous patterns of labor demand.

It's important to note first that our economy is always subject to large amounts of job turnover. Indeed, this is one hallmark of a dynamic, flexible economy, and it is not necessarily a bad thing on net. Data on worker flows—movements into and out of jobs—indicate that about 1 out of 3 job matches are dissolved each year, with a comparable rate of worker matching to new jobs (see Davis, Faberman, and Haltiwanger 2006). Over half of this job churning is voluntary, reflecting worker desires to find a job with higher wages, better working conditions, or a different location. Moreover, the degree of job creation and destruction has declined somewhat over the past 15 years, creating a picture of a more stable labor market.

However, involuntary displacement from permanent jobs, due to layoffs or downsizing, is important and has been on the rise over the past two decades. In particular, rates of worker displacement are up relative to measures of overall labor market conditions, such as the unemployment rate. For example, in the 2001 recession, which was relatively short and shallow, there was about as much worker displacement as in the early 1980s, when the economy went through the biggest recession in post-war history.<sup>6</sup>

In addition, the distribution of displacement has shifted towards the highly educated: workers holding a college degree saw nearly a 50% increase in their displacement rates between the early 1980s recession and the most recent one in 2001, while workers with a high school degree or less actually saw a slight decline in displacement rates. Of course, job displacement still remains a more significant issue for low-paid workers, but the instability that they have always faced has increasingly spread to higher-income groups.

Involuntary job loss frequently inflicts dire consequences, which have grown more severe over time. Involuntary job losers typically are unemployed for at least four months, about 70% longer than those who enter unemployment voluntarily. As such, the rising share of permanent job losers among the overall unemployed has helped keep the typical length of



an unemployment spell stubbornly high over the past few decades (Valletta 2005). The picture looks even gloomier when you recognize that some job losers withdraw from the labor force and are no longer counted as unemployed, so their observed unemployment spells understate the severity of the jobless experience. Put these factors together and it's clear that periods without earnings can be quite lengthy and costly for job losers. Moreover, when displaced workers do find new jobs, they're taking a pay cut of about 17% on average. The size of this wage loss in the early 2000s was the highest in at least 20 years.

Job displacement also has adverse consequences for health insurance coverage. Gruber and Madrian (1997) show that job loss substantially reduces access to health insurance over extended time periods, an effect only partially offset by federal COBRA guidelines, which require employers to make continued coverage available—at its full cost—to separated employees. The connection between displacement and the loss of insurance coverage reinforces a more general trend towards declining coverage through employment-based health insurance programs. For example, between 2000 and 2005, health coverage through employer-based programs fell about 4% nationwide, representing a loss of health insurance for several million Americans that was only partially offset by increased coverage through government-provided insurance.<sup>7</sup>

Given the increase in job displacement and earnings losses that I described above, it is not surprising that yearly fluctuations in individual earnings and family incomes have increased sharply since the 1970s (Hacker 2006). Indeed, between the 1970s and the early 2000s, the gaps between the highs and lows in a typical family's yearly income rose substantially: in the 1970s, a typical family might have seen its income vary from a high of \$60,000 to a low of \$30,000 over the decade, while in the more recent decade a family seeing that same high would tend to see a low of about \$15,000. Among families seeing declines in annual income, the size of the typical loss has increased: for example, the chances that an American family will see at least a 50% drop in its yearly income has more than doubled since the early 1970s, rising to about 1 in 6 families in recent years.

The increased risk associated with these income fluctuations is likely to reduce perceived well-being substantially, even if family incomes on average are growing over time. As with the risk of job loss, these income risks are most severe for less-educated Americans. However, during the 1990s, income instability rose relatively more for families with high educational achievement, consistent with the spread of involuntary job loss to highly educated individuals.

### Policy options

My focus thus far has been on the problems facing Americans in the labor market and not on potential solutions. It is natural to ask, then, whether anything can be done to alter these disquieting trends. Since technology and globalization have been identified with growing inequality, it might seem natural to look at these areas for possible solutions. While I sometimes feel like smashing my own computer, I wouldn't recommend this as a national policy! However, it's not uncommon to hear proposals to put up barriers to trade as a way to mitigate economic disruption and inequality. I don't think that is the way to go. By providing for specialization in production across countries, trade enhances the size of the economic "pie" here and abroad, and in doing so, enhances overall economic welfare. I think we should look to other policy tools to address inequality, and I will attempt to provide a useful overview of some key considerations.

I will begin with education. There can be little doubt that programs that support investment in education, broadly conceived, are worthwhile. Increasing skill has been a significant source of productivity growth. Moreover, since the gap between the earnings of workers with more and less skill in part represents the return to education, a widening of that gap clearly signals the need for such investment to increase the supply of higher-skilled workers.

But investment in education takes resources, which complicates the debate: the resources are limited and to a large degree should be directed to where they will pay the highest return. At the college level, one possibility is just to "let the market work." If college pays off, more young people will enroll. Indeed, the rising returns to education at the upper end of the earnings distribution did precede an increase in college attendance through the mid-1990s, suggesting that market forces may have worked as expected. Since then, however, despite further growth in the returns to college and advanced degrees, college attendance has flattened out. For example, enrollment rates among recent high school graduates hovered around 65% between 1996 and 2004, after increasing noticeably in the preceding decade (NCES 2005).

Does this imply that the highest priority for public funding for education should be the college level? Not necessarily. There certainly is a lot of public discussion by educators and politicians about problems with the quality of K-12 education in the U.S., and international comparisons show that U.S. students rank relatively low on standardized tests in science and math, the very kinds of skills that earn higher rewards.

But there is yet another contender for the scarce public funding for education. For example, Carneiro and Heckman (2003) have argued that these funds should be targeted at even younger children. Family background factors are critically important in student achievement, and recent evidence suggests that the cognitive and social skills associated with college attendance are developed very early in life. Moreover, skill acquisition is a cumulative process that works most effectively when a solid foundation has been provided in early childhood. As such, programs to support early childhood development, such as preschool programs for disadvantaged children, not only appear to have substantial payoffs early but also are likely to have lifelong payoffs.

But what about struggling adults, especially those who find that their skills have become outmoded due to technological change or globalization? Should the highest priority for public funding of education be the expansion of federally subsidized retraining programs, such as those associated with the Job Training Partnership Act, the Comprehensive Employment and Training Act, and the Job Corps program for disadvantaged youth? Krueger (2003), among others, views the outcomes of these programs as evidence that training investments often have high returns, especially for the economically disadvantaged, who cannot finance educational and training investments on their own.

Proponents of this view argue that these programs, which have been sharply curtailed over the past few decades, should be revived. In contrast, Heckman and others, looking at the same evidence, note the high cost of these programs relative to early childhood interventions and K-12 education, implying that retraining is financially unsound on a large scale. At this point, then, the evidence is unclear regarding the exact conditions under which adult education and retraining programs are cost-effective. However, it seems reasonable to consider providing workers buffeted by powerful economic forces a fair shot at retooling and finding new careers.

Beyond education and training, the U.S. has long deployed an array of policy tools to combat inequality and diminish economic insecurity. One example is the earned income tax credit, which supplements the earnings of low-income workers. Unemployment and disability insurance cushion family income in the face of job loss and illness, while Social Security shelters many elderly households from poverty. Indeed, inequality in consumption among U.S. families is notably lower than inequality in pre-tax income due to these programs and others that involve the direct provision of services such as healthcare, housing, childcare, and food stamps to families in need. The real question is whether government should and can do more.

To assess the value of and potential need for additional government intervention, it is instructive to draw some comparisons between the U.S. and other countries. In regard to inequality, over the past few decades it has risen more in the U.S. than in most other advanced industrial countries in the Organization for Economic Cooperation and Development (OECD). Indeed, by most measures, the U.S. ranks near the top (some might say the bottom) in terms of household income inequality. The inequality gap in the United States is associated with higher levels of overall and child poverty relative to a majority of OECD countries.<sup>8</sup>

This high and growing level of relative inequality in the U.S. reflects, in part, differences in the "social safety net." Among the 30 OECD countries, the U.S. ranks above only Mexico, Korea, and Ireland in gross public social expenditures as a share of GDP spending, and it does the least to target government taxes and transfers towards moving families out of poverty. Not surprisingly, outcomes such as infant mortality and life expectancy are worse in the U.S. than in most advanced industrial countries. As for workplace protections, unemployment insurance in the U.S. replaces a smaller share of income and offers benefits of shorter duration, while the minimum wage is quite low relative to average wages in the U.S. Moreover, U.S. firms face far fewer restrictions in their ability to fire or lay off workers than do firms in most other OECD countries.

Other countries' efforts to mitigate inequality and provide a safety net may come at a price, however, since these efforts may hinder job growth and intensify unemployment, especially for young and less-skilled workers. Indeed, over the past two decades, unemployment rates generally have been higher in other advanced countries than in the U.S. Heeding this lesson, some European countries have recently taken steps to reduce the distortions associated with generous social insurance programs and employment

protections. For example, some are following the U.S. lead, placing less emphasis on policies that discourage hiring and more on programs like the earned income tax credit. By contrast, the U.S. has done little to move closer to the European model of social protections and the reduction of inequality and poverty.

## Conclusion

This comparison of the U.S. and other advanced industrialized countries, though just a sketch, is suggestive. The possible responses to rising inequality do not boil down to "either/or" kinds of solutions. Rather, these responses range along a fairly wide continuum, reflecting the tradeoffs that policymakers face between efficiency and equity. Certainly some market-determined income differences are needed to create incentives to work, invest, and take risks. However, there are signs that rising inequality is intensifying resistance to globalization, impairing social cohesion, and could, ultimately, undermine American democracy. Improvements in education are an imperative for reducing inequality and an easily justifiable investment, given its high social return. In contrast, improvements in the social safety net entail costs, even when policy interventions are well-designed from an efficiency standpoint. Even so, in my opinion, they deserve high policy priority. Inequality has risen to the point that it seems to me worthwhile for the U.S. to seriously consider taking the risk of making our economy more rewarding for more of the people.

Janet L. Yellen  
President and Chief Executive Officer

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## Endnotes

1 From 1972 to 1997, nonfarm labor productivity rose at only a 1.7% rate, while real labor compensation rose at an annual rate of 1.3%.

2 Despite the widespread view that labor's share of total income has fallen as capital's share has gone up, there actually was no net change in these shares over 1997–2005, although there were fluctuations during the period.

3 These broad trends in inequality are also observed for men and women analyzed separately.

4 The basic story about inequality in real wages does not change if one broadens the analysis to include benefits or if one examines earnings or family income.

5 See Dew-Becker and Gordon (2005). Piketty and Saez (2006) show that in 2001 the top 1% of the income distribution held 15.4% of total income.

6 The job displacement figures in this paragraph and wage loss figures below are from Farber (2005).

7 See Buchmueller and Valletta (2006). Between 2000 and 2005, coverage through employment-based plans fell from 63.6% to 59.5%, while coverage through government programs rose from 24.7% to 27.3%.

8The OECD defines poverty as the share of households that receive 50% or less of the median income in each country and takes account of household size, cash transfers, taxes, and tax credits.

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*Research Department  
Federal Reserve Bank of San Francisco  
P.O. Box 7702  
San Francisco, CA 94120*

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