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Selected Issues in the Rise of Income Inequality

INCREASED AMERICAN INCOME INEQUALITY, in particular the increased skewness at the very top of the income distribution, has received enormous attention. This paper surveys three aspects of rising inequality that are usually discussed separately: inequality within the bottom 90 percent, inequality within the top 10 percent, and international differences in inequality, particularly among top earners.

We begin by examining data from the Current Population Survey (CPS) on income ratios between the 90th, 50th, and 10th percentiles, both for men and women separately and for the two sexes combined. We then examine several proposed explanations of changes in relative incomes within the bottom 90 percent, including the impacts of unions, free trade, immigration, the real minimum wage, and top-bracket tax rates. We also assess the hypothesis that the primary driver of increased inequality is skill-biased technological change.

We then tackle the most controversial issue, namely, why American incomes at the very top have increased so much, both relative to incomes below the 90th percentile in this country and relative to top incomes in Europe and Japan.[1] We distinguish three types of top-level income earners:

1. Our initial work on inequality (Dew-Becker and Gordon, 2005) explains the gap between the growth of mean and the growth of median labor income.

"pure superstars" in sports and entertainment, a second group of professionals whose compensation also appears market driven but not amplified by access to a mass audience, and corporate executives, whose incomes are arguably not market driven but who instead can manipulate their pay to their own advantage. Our examination of cross-country differences finds that inequality at the top has increased more in the United States and the United Kingdom than in continental Europe, for what seems to be a combination of reasons.

Facts about the Bottom 90 Percent

Our 2005 Brookings Paper reported that during 1966–2001 only the top 10 percent of the income distribution enjoyed gains in real wage and salary income equal to or above the economy-wide rate of productivity growth.[2] Accordingly, here we analyze the lower 90 percent of the income distribution separately from the top 10 percent. Drawing the line at the 90th percentile is convenient: the widely used CPS data apply best to income groups at and below that threshold, since top-coding limits what the CPS data can tell us about income shifts within the top 10 percent.

Much of the literature on changes below the 90th percentile emphasizes their exact timing. The top panel of figure 1, which depicts average hourly wage trends for men and women combined, shows differences in timing when different points in the distribution are compared: the ratio of wages at the 90th percentile to that at the 50th (the 90-50 ratio) increases more or less steadily after 1979, whereas the 50-10 ratio shows a sharp increase during 1980–86 followed by a slow and partial reversal. The 90-10 ratio, which combines these trends, shows a distinct increase between 1980 and 1988 followed by a plateau at a level between 20 and 25 percent above that of 1979.[3]

However, the depiction of trends for both sexes combined blurs some sharp differences in the patterns for men and women taken separately. For men (middle panel of figure 1), the 50-10 ratio has returned by 1998 to its 1979 level, after a temporary jump in 1979–86. Meanwhile the 90-50 ratio increases at almost a constant rate, rising 14 percentage points between 1979 and 1990 and another 11 percentage points between 1990 and 2005. The data for women (bottom panel) are more surprising. Their 90-50 ratio follows the

2. Dew-Becker and Gordon (2005).
3. Data are from the *State of Working America* database at the Economic Policy Institute website (www.stateofworkingamerica.org/tabfig.html).

Figure 1. Changes in Ratios of Average Hourly Wages at Various Percentiles of the Distribution, 1973–2005[a]

Percent (log) difference from 1979

Men and women combined

Men

Women
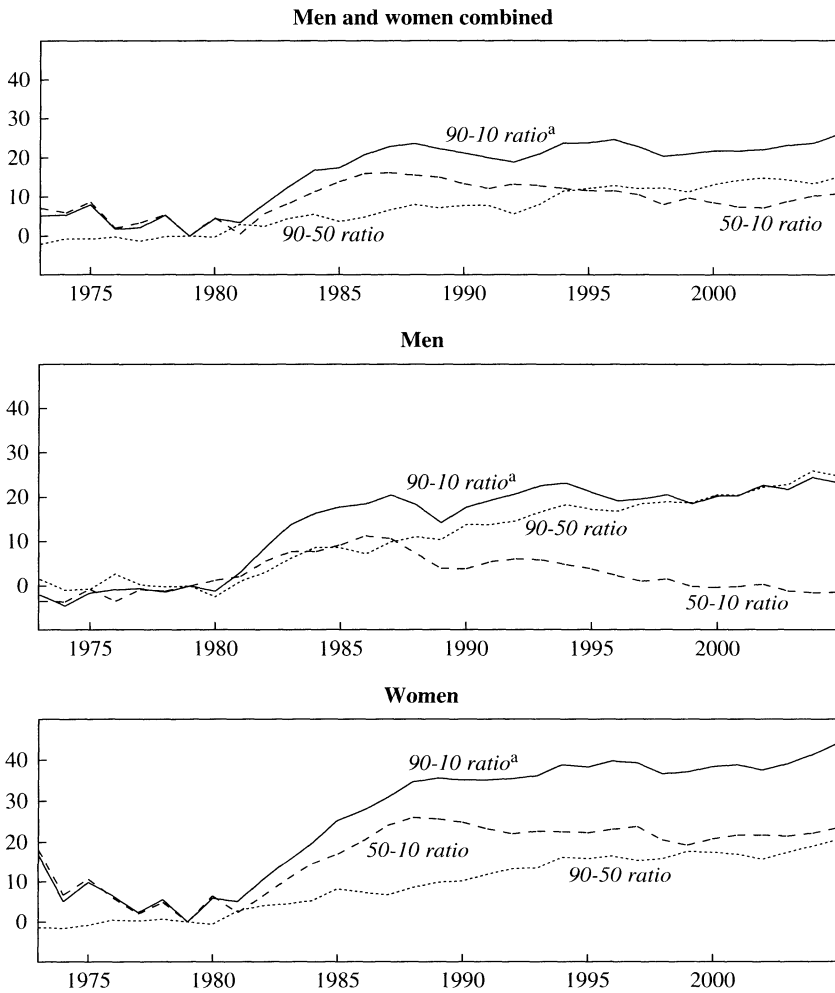
Source: Authors' calculations using data from the Economic Policy Institute.
a. Ratio of average hourly wages at the 90th percentile of the distribution to that at the 10th.

same path as that for men, but their 50-10 ratio increases much more, and the increase is sustained. This is consistent with the fact that women are roughly twice as likely to be paid the minimum wage as men.[4] Perhaps most surprising is that the overall increase in the 90-10 ratio for women is almost *double* the increase for men: 44 log percentage points versus 23.

All of the numbers just cited understate the overall increase in inequality, because much of that increase has occurred *within* the top 10 percent of the income distribution. As our 2005 paper documented using Internal Revenue Service data,[5] an important distinction should be made between income at the 90th percentile and the average income within the top decile, because increased skewness within that decile makes average income rise faster than 90th-percentile income. We showed that half of the total rise of inequality over 1966–2001 represents the higher 90-10 ratio discussed above, and the other half represents increased skewness within the top decile.[6] We return to the issue of top-decile inequality later in the paper.

Institutions and the Bottom 90 Percent

To understand what has influenced the income distribution below the 90th percentile, we begin with the three factors stressed by Claudia Goldin and Robert Margo as sources of their 1940–70 "Great Compression," namely, the rise of unionization, the decline of international trade, and the decline of immigration.[7] These factors convincingly explain the reduction in inequality among the bottom 90 percent during 1940–70, and their reversal explains much of the increased inequality after 1970. Later we examine the effect of changes in the real minimum wage and other types of institutional change.

The share of U.S. employees belonging to unions declined rapidly from 27 percent in 1979 to 19 percent in 1986, and then more slowly to 14 percent in 2005.[8] Since the real minimum wage was declining at approximately the same time, it is difficult to distinguish empirically between those two factors in accounting for the rise in the 50-10 income ratio. David Card, Thomas Lemieux, and Craig Riddell find that the decline in unionization

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4. See Bureau of Labor Statistics (2006).
5. Dew-Becker and Gordon (2005, p. 113).
6. Piketty and Saez (2003) also provide a detailed analysis of the top quantiles.
7. Goldin and Margo (1992).
8. Mishel, Bernstein, and Allegretto (2007, figure 3W, p. 182).

explains a relatively small 14 percent of growth in the variance of male wages between 1973 and 2001 and none of the increased variance of female wages. This supports Richard Freeman's earlier finding that unions tend to reduce wage inequality among men (but not women), because the inequality-increasing "between-sector" effect is smaller than the dispersion-reducing "within-sector" effect.[9] Lawrence Mishel, Jared Bernstein, and Sylvia Allegretto concur with Card, Lemieux, and Riddell and the previous literature in finding that unions' effect in raising wages and benefits is greatest at the middle of the income distribution relative to the top and bottom, and that this effect is strongest for high school graduates.[10]

The ratio of imports to U.S. GDP increased from 5.4 percent in 1970 to 16.2 percent in 2005. Several researchers, including Almas Heshmati and Tracy Miller,[11] argue that unskilled labor embodied in imports is a substitute for domestic unskilled labor, and that the growing import-GDP ratio since 1970 has contributed to the lower relative wages for unskilled workers observed since 1979. Thus far, however, we have not found in the literature any quantitative estimate of the import effect.

Annual immigration (legal and illegal) as a share of the U.S. population increased steadily from 0.13 percent in 1960 to 0.41 percent in 2002.[12] Immigration has accounted for more than half of total U.S. labor force growth over the past decade,[13] and the share of foreign-born workers in the labor force has grown steadily from 5.3 percent in 1970 to 14.7 percent in 2005.[14] Since 1990 foreign-born workers have outnumbered African American workers.[15]

A large and controversial literature studies the effect of immigration on the wages of native-born workers. A set of papers by George Borjas argues that immigration reduced real wages for native-born workers from 1980 to 2000 by about 3 percent,[16] and by almost 9 percent for native-born workers without a high school diploma.[17]

    9. Card, Lemieux, and Riddell (2004); Freeman (1980).
   10. Mishel, Bernstein, and Allegretto (2007).
   11. Heshmati (2007); Miller (2001).
   12. Gordon (2003, p. 268).
   13. Orrenius and Zavodny (2006).
   14. Ottaviano and Peri (2006, p. 1).
   15. See Kopczuk, Saez, and Song (2007, figure 10).
   16. Borjas (2003, 2006); Borjas and Katz (2005).
   17. Borjas (2003, table IX, p. 1369). Williamson (2006) provides an intriguing analogy to the late nineteenth century, when the flow of immigrants into the United States raised inequality here but the outflow from Scandinavia reduced inequality there.

Gianmarco Ottaviano and Giovanni Peri make a novel point about immigration.[18] Low-skilled immigrants disproportionately enter occupations already staffed by foreign-born workers (such as restaurant work and landscape services), and thus their main impact is to drive down the wages of other foreign-born workers, not native-born workers. It had previously been noted that, among high school dropouts, the wages of native- and foreign-born workers were almost identical up to 1980, but by 2004 foreign-born workers were earning 15 to 20 percent less. This had previously been interpreted as evidence of a declining skill level among new immigrants, but Ottaviano and Peri claim that this shift is consistent with their interpretation of increased competition of immigrants with each other in those job classifications in which they specialize.

There is a contentious literature on the effects of the minimum wage on employment, but less evidence on its effect on wage inequality. Mishel, Bernstein, and Allegretto report that the real minimum wage declined (in 2005 dollars) from $7.23 to $5.09 between 1979 and 1989, then rose in two steps to $6.25 in 1997 before falling back to $5.15 in 2005. The decline in the minimum wage in proportion to the average hourly earnings of production and nonsupervisory workers over the same period was more gradual, from 45 percent in 1979 to 31 percent in 2005.[19]

Card and John DiNardo advocate the hypothesis that the erosion of the real minimum wage accounts for much of the increase of inequality as represented by the 90-10 ratio.[20] They find an almost perfect negative correlation between the decline in the real minimum wage and the increase in the 90-10 ratio, as most of these co-movements were concentrated in the 1980–86 period. However, as noted above, at the same time that the minimum wage was falling, other institutional changes were occurring that likely also affected inequality.

A possible weakness in the minimum wage story is that, as the bottom panel of figure 1 showed, the female 50-10 ratio did not respond at all to the increase in the real minimum wage from 1989 to 1997 or to its subsequent decline, even though, as noted above, women are more likely to be paid the minimum wage. This throws doubt on whether the minimum wage is the single factor explaining the large increase in 50-10 inequality in the early 1980s.

18. Ottaviano and Peri (2006).
19. Mishel, Bernstein, and Allegretto (2007, pp. 190–95).
20. Card and DiNardo (2002).

Overall, we find that the increase in the 90-10 ratio since the late 1970s is due, at least in part, to the declining bargaining power and coverage of unions, to the increased importance of imports and immigration, and to the decrease in the real minimum wage. Frank Levy and Peter Temin provide a complementary interpretation that places more emphasis on a change in political philosophy from what they call the "Detroit consensus" of the late 1940s to the Reagan-initiated "Washington consensus" of the early 1980s.[21] The main point that Levy and Temin add is that highly progressive taxes, with 90 percent marginal tax rates for top-bracket earners in the 1940s and 1950s, sent a signal that very high incomes were socially unacceptable. Further, high marginal tax rates limited the rate at which the very rich could accumulate capital income. Beginning with the Reagan tax cuts, that element of the policy support of the Great Compression began to erode.

Skill-Biased Technological Change

Thus far the timing seems to support major roles for declining unionization (for men over 1980–86) and a declining real minimum wage (for women over 1980–89) in the rise in the 50-10 ratio. The next puzzle to be resolved is the source of the gradual steady increase in the 90-50 ratio for both men and women throughout the post-1979 period.

A central unifying hypothesis in the labor economics literature on inequality is the role of skill-biased technological change (SBTC), which was initially based on a simple model in which two skill classes of labor are imperfect substitutes.[22] Because both the relative quantity of college graduates and the relative wage they receive have increased since 1970, the SBTC hypothesis argues that employer demand must have shifted toward more-skilled workers.

A consistent theme of the SBTC literature is that the 90-50 ratio has increased markedly since the 1970s but that the 50-10 ratio has increased little if at all. We have already seen that this statement is accurate for men but not for women. At least for men, whatever skills SBTC favors must be

21. Levy and Temin (2007).
22. See, for example, Bound and Johnson (1992) and Juhn, Murphy, and Pierce (1991); Card and DiNardo (2002) provide an extensive review of the literature.

those of workers well above the 50th percentile. What we are looking for, then, and what the SBTC literature has sometimes been vague about, is the nature of the skills that favor those at the 90th percentile and above but are lacking at, say, the 70th percentile and below.

David Autor, Katz, and Melissa Kearney,[23] building on earlier work by Autor, Richard Murnane, and Levy,[24] adopt a three-way distinction among nonroutine cognitive work (including that of CEOs, lawyers, investment bankers, professors, and doctors), routine repetitive work (bookkeepers, accountants), and manual interactive work (truck drivers, nurses, waiters). This distinction emphasizes that work at the top and the bottom is inherently interactive and thus less prone to outsourcing than the noninteractive middle jobs. SBTC has increased the demand for people in the top group, while trade allows firms to substitute away from domestic workers in the middle group. The increased demand for skilled workers has also driven up college wage premia, because of reduced growth in the relative supply of college workers.[25]

Increased Inequality at the Top

We now turn to the phenomenon of increased skewness within the top decile. We introduce a three-way distinction among superstars in the sports and entertainment industries; high-paid, high-skilled workers, such as lawyers and investment bankers, who lack the audience-magnifying properties of superstars; and the controversial additional category of CEOs and other top corporate managers.

In his 1981 paper on the economics of superstars,[26] Sherwin Rosen explained the extreme skewness in certain occupational categories (primarily those involving public performance) in terms of particular characteristics of their demand and supply. On the demand side, audiences want to see the very best talent, not the second-best, and so the ability of top superstars to fill large entertainment venues and to sell recordings is an order of magnitude higher than that of second-best stars. On the supply side, the

23. Autor, Katz, and Kearney (2005).
24. Autor, Murnane, and Levy (2003).
25. For a more complete discussion of college wage premia, see Goldin and Katz, this volume.
26. Rosen (1981).

performer exerts the same effort whether 10 or 10,000 witness the performance. Together these considerations give rise to a wage premium for superstars.

The superstar premium reflects a particular type of SBTC. Rosen suggested that a succession of innovations going back to the phonograph increased the size of audiences who can experience a given performance and thus increased the incomes of superstars by many multiples. The sharp further increase in superstar incomes since Rosen's article reflects the further development of technology, including cable television, rentable videotapes and DVDs, and downloadable music.

The high incomes of our second group likewise reflect the operation of market forces. Workers in certain prestigious professions, especially top-rank lawyers and investment bankers, earn incomes that are determined by market demand for the services provided by their firms, whether an enormous law firm like Chicago's Sidley Austin or an investment bank like Goldman Sachs. Unlike with superstars, however, the work product of these professionals is not distributed to a mass audience by electronic media. They are still tied down by the need to meet in person with clients or to personally attend legal proceedings with adversaries.

Robert Frank and Philip Cook provide a unified analysis of these two groups.[27] They begin with sports and entertainment stars, where a clear definition of "winning" translates into disproportionate pay premia. Their main contribution beyond Rosen is to broaden the context of the tournament and the definition of success. Frank and Cook argue that certain leading "brands" dominate some professions in the same way that popular product brands and their extensions (Apple-Cinnamon Cheerios, for example) dominate shelf space in supermarkets. They thus extend the context of superstars to "law, journalism, consulting, medicine, investment banking, corporate management, publishing, design, fashion, and even the hallowed halls of academe."

Although Frank and Cook include "corporate management" among the winners in their winner-take-all paradigm, we treat top corporate officers separately. We distinguish this group because an ample literature indicates that CEO pay is not set purely on the market, but rather by collusion among peer CEOs who sit on each other's compensation committees.[28]

27. Frank and Cook (1995).
28. See Murphy (1999) for a review of this literature.

Lucian Bebchuk and Jesse Fried provide comprehensive evidence in favor of a managerial power hypothesis that drives top executive pay well above the market solution.[29] This is supported by the finding of Bebchuk and Yaniv Grinstein that among the top five corporate officers in each of the firms in the S&P 1,500 index, pay increased by almost twice as much between 1993 and 2003 as a set of standard market variables, including sales, return on assets, and the market return on the firm's stock, could explain.[30] The ratio of top-five compensation to corporate profits among these firms rose from 5.0 percent in 1993–95 to 12.8 percent in 2000–02.[31]

Bebchuk and Grinstein's work is subject to two major criticisms. First, for their empirical model to make sense, the factors that determine the cross section of CEO pay must also have the same effects as pay changes over time. Xavier Gabaix and Augustin Landier have argued that the cross section and the time series need not behave identically.[32] Second, executives likely care about share prices, not profits, because during the 1980s the share of top executive pay taking the form of stock options rose from 40 percent to 70 percent. If share prices rose faster than profits over the period they examined (that is, if the price-earnings ratio rose), then the ratio of executive pay to market capitalization would have increased less than the ratio of pay to profits. In fact, the price-earnings ratio of the S&P 500 rose only a modest 16 percent over the Bebchuk-Grinstein interval of 1993–2003.[33] One must look earlier to find large increases in the price-earnings ratio. (It doubled between 1990 and 1999.) Since price-earnings ratios clearly did increase enormously during much of the big run-up in executive pay in the 1980s and 1990s, it is worth considering the simple equilibrium explanation of Gabaix and Landier that executive pay moves in proportion to market capitalization.

29. Bebchuk and Fried (2004).
30. Bebchuk and Grinstein (2005).
31. Kaplan and Rauh (2007) point out that much of the high income is earned by lawyers and investment bankers, not just CEOs. However, they minimize the importance of CEOs and Wall Street pay by dividing through by adjusted gross income rather than W-2 income, which was the focus of our 2005 study of the growth of skewness in labor income. This debate is beyond the scope of this paper, as it involves such issues as the fact that lawyers report their earnings as partnership (proprietors') income, not as W-2 income.
32. Gabaix and Landier (forthcoming).
33. Using the price-earnings ratio calculated as the inverse of the earnings-to-price ratio for the S&P 500, from *Economic Report of the President 2006,* table B-95.

The Gabaix-Landier model is based on a set of theoretical distributions for firm size and CEO talent. Their stunning result is that the time-series elasticity of average CEO pay to aggregate stock market capitalization is predicted to be exactly unity: "The sixfold increase of CEO pay between 1980 and 2003 can be fully attributed to the sixfold increase in market capitalization of large US companies during that period." They also derive a superstar effect, in that "a very small dispersion in CEO talent . . . justifies large pay differences."[34]

One reason for skepticism is that the authors' own data do not support a unitary elasticity. Their figure 1 shows that, over 1970–2000, their preferred "JMW" index of executive compensation increased 22-fold while market capitalization increased roughly 8-fold.[35] More troublingly, the results that drive the Gabaix-Landier hypothesis do not hold before 1970. Carola Frydman and Raven Saks study executive compensation going back to 1936.[36] They run regressions similar to those of Gabaix and Landier to find the elasticity of CEO compensation to both own-firm and average-firm size. They confirm the result from Gabaix and Landier, and from Rosen,[37] that the cross-sectional elasticity of CEO pay with respect to firm size is 0.3. But they reject the hypothesis of a unitary elasticity between CEO pay and average firm size, instead finding an elasticity closer to 0.1 for most of their sample, both including and excluding the Great Depression and World War II.

We also tried to replicate Gabaix and Landier's result for 1970–2005. Rather than simply taking the entire period as one regression sample, however, we ran rolling twenty-year regressions to see how the compensation–firm size elasticity might have changed over time. Figure 2 plots the results, which show a large rise in the point estimate over time, from approximately 0.5 to 1.5. So a unit elasticity does not seem to be an accurate description of CEO pay even for 1980–2005.

Nevertheless, one thing that is clear is that the relationship between firm size and CEO pay has not been stable over time, and this leads to two possible conclusions. First, it may be that no connection exists between
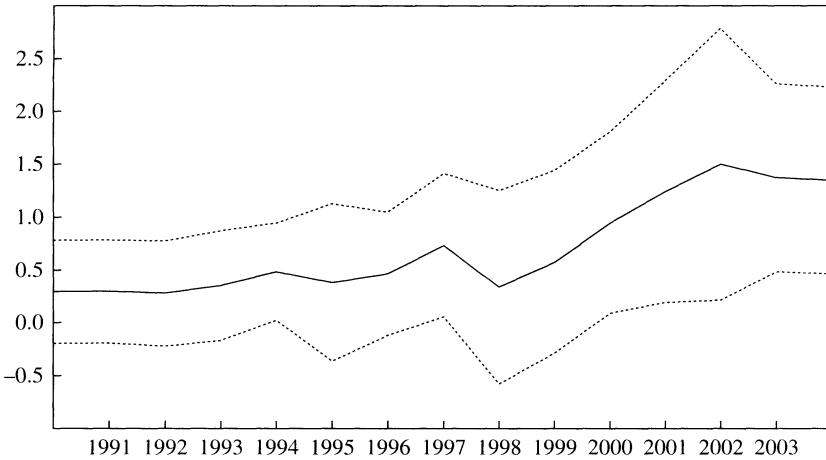
34. Gabaix and Landier (forthcoming, abstract).

35. According to their figure 1, the 1970 and 2000 observations for the JMW index are 0.5 and 11, respectively, whereas the numbers for market capitalization are 0.8 and 6.7.

36. Frydman and Saks (2007).

37. Rosen (1992).

Figure 2. Results of Rolling Regressions of CEO Compensation on Firm Size, 1990–2004[a]

Coefficient on firm size variable

firm size and CEO pay, and all theoretical attempts at finding one are misguided. If the distribution of firm size is separate from more structural factors such as the aggregate capital stock, one might not expect to find any relationship between firm size and CEO pay. On the other hand, if the average firm grows at precisely the same rate as the average quantity of capital per worker—for example, if the number of workers per firm tends to be stable—then one would expect to see a strong correlation between average firm size and the pay of *every* employee.

Bebchuk and Fried provide substantial evidence that the principal-agent setting alone cannot explain the salient facts about CEO pay.[38] They propose an alternative model in which CEOs have control over boards of directors and are mainly restricted by an "outrage constraint," whereby shareholders retaliate if they perceive executive compensation to be excessive. The key assumption of the standard principal-agent situation, that

38. Bebchuk and Fried (2004).

directors are independent, turns out to be highly questionable. To start with, their pay is far from negligible—an average of $152,000 a year in the top 200 firms. Although directors also usually own stock in the companies they oversee, presumably they stand to gain less from good governance than the salary they would lose if they were not renominated. Moreover, directors often receive substantial nonsalary benefits in the form of perks, or in business directed to their own firms. As already noted, if a CEO is also on the boards of any of his or her directors, there are ample opportunities for tit-for-tat relationships.

Bebchuk and Fried provide ample evidence that firms work to disguise the magnitude of CEO pay.[39] If contracts were optimal, firms would have no reason to try to hide what their CEOs earn. But if instead firms are bound only by an outrage constraint, they will have every reason to hide that information. This type of camouflage is available because the financial press generally reports only annual salary compensation, ignoring deferred compensation and benefits.

One of the most salient features of the recent run-up in executive compensation is the use of stock options. Brian Hall and Jeffrey Liebman propose two alternative explanations for the dramatic increase in the use of options; like much of the above analysis, they test a market-driven account against a managerial power story.[40] The first explanation is that corporate boards want to strengthen the relationship between pay and performance. This echoes the argument that the optimal set of incentives would not be tied exclusively to market performance. The second explanation, complementary to the first, is that boards want to increase CEO pay regardless of performance and choose options as a "less visible" form of compensation that is less likely to incite stockholder anger.

### International Comparisons

Perhaps the most challenging facts to be explained rest in the raw international data on inequality at the top as summarized by Thomas Piketty and Emmanuel Saez and analyzed by Anthony Atkinson.[41] Figure 3 summarizes

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39. Murphy (2002) provides some criticism of this proposition.
40. Hall and Liebman (1998).
41. Piketty and Saez (2006a, 2006b); Atkinson (2007).

Figure 3. Share of the Top 1 Percent in Total Income in Selected Industrial Countries, 1920–2000ᵃ

Percent of total income
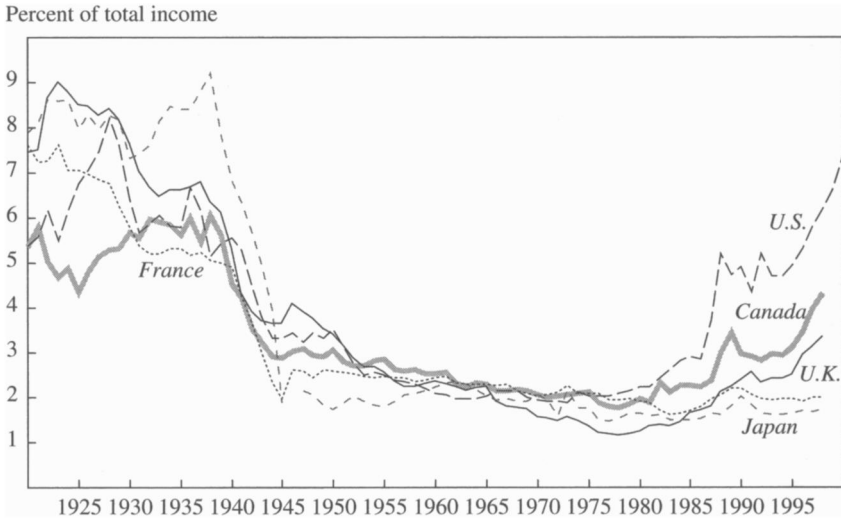
Source: Piketty and Saez (2006b).
a. Total income includes labor, business, and capital income but excludes capital gains.

Piketty and Saez's remarkable compilation of data on the income shares of the top 1 percent over the period since 1920 in Canada, France, Japan, the United Kingdom, and the United States. (Here income includes labor, business, and capital income but excludes capital gains.)

The contrast between the United States and the other countries in recent years could not be more dramatic. The income share of the top 1 percent of the U.S. distribution traces out a distinct U-shaped pattern over time, with a high of 8.2 percent reached in 1928, then a slide to a minimum of 1.9 percent reached in 1973, followed by a steady increase to 7.3 percent in 2000. Japan's performance differs the most from the U.S. pattern: there the share of the top 1 percent has remained stable since 1947 at around 2.0 percent. Shares in the other countries range widely, but all (except Canada briefly) remain above 5 percent between 1920 and 1938, falling to about 2 percent between 1960 and 1980. The upsurge in the top income share after 1980 was led by the remarkable increase in the U.S. ratio, followed by Canada and the United Kingdom, which appear to mimic the U.S. performance with an elasticity of between 0.3 and 0.5. Meanwhile the top share

in France and Japan hardly budged. These findings amount to a conundrum of great importance in assessing the behavior of inequality on both sides of the Atlantic.

Other data applying to the entire distribution, not just the top 1 percent, support the view that inequality is higher in the United States than in the rest of the developed world.[42] Thomas Harjes finds, however, that the Gini coefficient rose more in the United Kingdom than in the United States between the late 1970s and the late 1990s, and that the increase was substantial in Germany and Spain but was zero in Italy and slightly negative in France.[43] Harjes thus paints a picture not of a sharp contrast between the United States and everyone else, but of a high degree of heterogeneity. He also points out that labor's income share has fallen by 6 to 10 percentage points in most European countries but has remained stable in the United States. Since capital income tends to be more concentrated than labor income, this can mechanically increase inequality.

One approach taken by Mishel, Bernstein, and Allegretto and by others to explain the high relative level and growth of inequality in the United States is to find factors in the socio-politico-economic "system" that differentiate the United States from other developed countries.[44] Yet, as Harjes notes,[45] this "American exceptionalism" approach misses the heterogeneity in the level and growth of inequality outside the United States. It may be that countries have adopted a variety of models using different combinations of policies and institutions. For example, the "consensus model" adopted in the Netherlands, and to a lesser extent in Sweden, Ireland, and Germany, obtained moderation in wage demands in return in some cases for reduced income taxes, and in other cases with the expectation that managers would avoid seeking excessive compensation increases. In Germany executive compensation is held down by such institutional features as the two-tier company board with strong labor representation, "legal co-determination rights," and a high tax rate on capital gains from stock options.[46]

Alberto Chong and Mark Gradstein find a joint relationship between inequality and general institutional quality.[47] Using panel data from a large

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42. Smeeding (2006) contains more comparisons of Gini coefficients.
43. Harjes (2007).
44. Mishel, Bernstein, and Allegretto (2007, p. 357).
45. Harjes (2007).
46. Ponssard (2001).
47. Chong and Gradstein (2007).

set of countries over twenty years, they find that inequality drives future institutional quality—a result obtained by numerous other researchers[48]— but also that institutions in turn drive future inequality. This relationship holds for a variety of measures of institutions, including indexes of civil liberties, political rights, government stability, corruption, and rule of law.[49]

At the very top level of incomes plotted in figure 3, Piketty and Saez point out that the divergence between the English-speaking countries and the others occurs only in labor income, not capital income, as the "working rich" have replaced the "rentiers."[50] They propose three broad classes of explanations. The first is SBTC favoring people at the top, but they note that technological changes have been similar everywhere whereas top income shares have not. The second class includes changes in regulations, unions, and social norms, a view that they claim implies that "the surge in executive compensation actually represents valuable efficiency gains."[51] The third class is the U.S. managerial power explanation that we associated above with Bebchuk and coauthors, namely, "the increased ability of executives to set their own pay and extract rents at the expense of shareholders."[52]

We favor a blend of all three explanations. We see the market at work in the increase of market capitalization in the United States spilling over into executive compensation through the greater use of stock options here than in other countries. We supported the managerial power view in our summary of Bebchuk's work above. And we have summarized several institutional differences that we believe have an impact.

The greater use of stock options to reward executives in the United States than in other countries itself reflects institutional differences. Some of these involve differences in the taxing of stock options.[53] In Germany only half of the companies in the leading stock market index have any stock option program at all.[54] And until 1997 stock options were illegal in Japan, except

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48. For example, Alesina and Angeletos (2005), Alesina and La Ferrara (2005), Hoff and Stiglitz (2004), and Sonin (2003).

49. Chong and Gradstein (2007) also provide a concise review of the rather small literature on institutions and inequality.

50. Piketty and Saez (2006a, 2006b).

51. Piketty and Saez (2006b, p. 7).

52. Piketty and Saez (2006b, p. 7).

53. Tom Buerkle, "Stock Options, Once Derided, Catch on in Europe," *International Herald Tribune,* April 5, 2000.

54. Eric Pfanner, "Pay Plans Get Review after Microsoft Shift: In Europe, a New Look at Options," *International Herald Tribune,* July 10, 2003.

at small start-up companies. Restrictions were loosened in 2001, but major Japanese companies adopted stock options only with a long lag, following decades of tradition in which executive pay was many multiples less relative to average worker pay than in the United States.[55] This may have held down inequality in Japan.

In short, we see no single dominant explanation for the increase in CEO pay in the United States relative to other developed countries. Price-earnings ratios increased more here than elsewhere, at least through 2000, and this, together with the widespread and growing use of stock options, caused stock market gains to spill over into CEO pay. To some extent the lesser use of stock options abroad represents a catch-up phenomenon, with European companies adopting U.S. practices after a lag of one or two decades.

Conclusion

This paper has reviewed the increase in American inequality since 1970 at the bottom, middle, and top of the income distribution. We distinguished between the rise in inequality outside the top 10 percent, as measured by the 90-10 income ratio, and in inequality within the top 10 percent. We suggested that roughly half of the total increase in inequality since 1966 reflects the 90th percentile gaining relative to the 10th percentile, and that the other half has occurred within the top 10th percentile, particularly the top 1 percent.

For the 90-10 ratio we found a role for a reversal of the Goldin-Margo "Great Compression" and the Levy-Temin "Detroit consensus." Eroding union power, increasing imports, increasing immigration, a decreasing real minimum wage, and a decline in top-bracket tax rates have all played a role, in different magnitudes at different times since 1975. For the 90-50 ratio we endorsed the effort by Autor and coauthors to broaden the skills distinction to three or more categories; their polarization hypothesis also makes a lot of sense in explaining the facts about rising inequality and the occupations most prone to outsourcing.

We reviewed the ample evidence that SBTC is a major explanation of increased skewness of labor incomes at the top. We distinguished three

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55. Brian Bremner, "The Stock-Option Option Comes to Japan," *Business Week,* April 19, 1999.

different types of top income earners. The first are the superstars, the top members of any performance occupation; here the magnification of audiences provides disproportionate rewards to the very best compared with the second-best. A second category of top incomes is also market-driven and includes partners in law firms, investment bankers, and hedge fund managers; for this category there is no obvious analogy to audience magnification.

The most contentious question concerns the sources of the enormous increase in the United States, but not in Europe or Japan, in the ratio of top executive compensation to average worker compensation. The core distinction among the three categories is that incomes in the first two are chosen by the market, whereas the compensation of executives is chosen largely by their peers in a system that gives them and their hand-picked boards of directors, rather than the market, control over incomes. We endorse Bebchuk and Fried's idea that managerial power lies behind some of the outsized gains in CEO pay. By enriching the principal-agent model, they provide a much more realistic model of the interactions among shareholders, boards, and executives.

Some of the most interesting remaining issues involve cross-country differences, and here some of the most interesting explanations involve differences in institutions. These include different governance structures for top executives and differences in the use of stock options as executive compensation. There is also evidence that, in countries with a long history of tax progressivity, highly redistributive systems persist. Researchers also have found that low inequality feeds back into high-quality institutions, creating, at least for those who favor greater equality, a virtuous cycle.

The study of income inequality is of fundamental importance to economics for several reasons. The most obvious is that if economics is at all concerned with understanding the development of economies over time, we must understand not only changes in means, but also changes in distributions. Second, changes in inequality can be indicative of changes in the structure of the economy (such as SBTC) that may favor one group or another. Third, variation in inequality can indicate how well the various theories about risk sharing and consumption smoothing actually fit with experience. Fourth, one can learn about the effects of various institutions on inequality by studying the experiences of different countries, thus allowing better-informed policy choices. What those choices should be, however, lies beyond the reach of this paper.

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