The effects of economic growth on income inequality in the US

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ABSTRACT

The paper analyzes the relation between growth and income inequality in the US during the post-war years (1953–2008). We show that the income of the top income groups is more sensitive to growth, defined broadly as current growth and changes in expectations of future growth, compared to the income of the lower income groups. We provide evidence that this increased sensitivity arises for two reasons: (a) the top income groups receive a large portion of their income from wealth, which is more sensitive to growth than labor income and (b) the top income groups receive a large portion of their labor income in the form of pay-for-performance (equity compensation), which is also sensitive to growth. Consequently, we conclude that growth and income inequality are positively associated.

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1. Introduction

The relation between economic growth and income inequality has long been a subject of debate. As far back as the early 1960s, President John F. Kennedy used the metaphor of a rising tide that lifts all boats to explain the idea that growth is good for the poor as well as the rich.[1] However, whether the poor can reap the benefits of growth to the same extent as the rich remains an open question.

In this paper we examine the intertemporal relation between income-inequality and economic growth in the US by recognizing that income-inequality is dependent not only on concurrent growth but also on expectations about future economic growth. Our framework is based on the fact that total income comprises different types of labor income (e.g., fixed wages and pay-for-performance compensation) and non-labor (wealth) income streams, which have different sensitivities to changes in current growth and expectations about future growth rates. Therefore, to understand the complex relation between "growth"[2] and income-inequality, one has to consider the distribution of income sources across the different income groups as well as the relation between these income sources and growth.

We conjecture that high-income groups in the US can be distinguished by two main characteristics. First, they derive a large part of their income from wealth (capital gains, dividends, rent, interest), and second, they receive a relatively high wage for their labor, partly in the form of equity related compensation (e.g. stock options and restricted shares). We

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[1] John F. Kennedy, October 3, 1963, "Remarks in Heber Springs, Arkansas, at the Dedication of Greers Ferry Dam."
[2] When we use the term "growth" or "growth process", we are referring jointly to current growth rate as well as expectations about future growth rates. Note that in a rational expectation economy, expectation about future growth should converge to the realized future growth.

therefore argue that the question of whether growth increases income inequality ultimately depends on which is more sensitive to the growth process, wealth income or labor income, and labor income of top earners or labor income of low earners. These two aspects form the basis for our two hypotheses: the wealth hypothesis and the pay-for-performance hypothesis.

The *wealth* hypothesis posits that a small permanent change in growth will have a multiplicative effect on the value of wealth and human capital (stock variables).[3] However, while wealth can be converted into cash relatively easily, there are obvious frictions in converting human capital into cash either because of labor laws or incentive (contracting) difficulties. The hypothesis therefore posits that wealth derived income is more sensitive to growth than labor income, resulting in a positive association between growth and inequality.

The *pay-for-performance* hypothesis is based on the widely accepted idea that performance-based compensation schemes (e.g., bonuses, stock and option grants) constitute an important component of high income workers' wages (Juhn et al., 1993; Piketty and Saez, 2006; Lemieux et al., 2009; Frydman and Saks, 2009; Kaplan and Rauh, 2010). Therefore the hypothesis posits that the labor income of the top income groups will be more sensitive to growth than that of low-income groups, which in turn also suggests that growth is associated with higher income inequality.

The two hypotheses imply that analysis of the relation between income inequality and growth must separate between current growth and shocks to expected future growth. While growth in GDP is widely accepted as a measure of current growth, measuring changes in expected future growth rate is less trivial. We use the return on the stock market as a proxy for variation in expected future growth rates because of its proven predictive ability of future growth rates in GDP (Fama, 1981, 1990; Geske and Roll, 1983; Kaul, 1987; Barro, 1990), and its ability to encompass changes in expectations of future growth rates in a parsimonious way. Furthermore, the return on the stock market directly affects wealth as well as stock-based compensation and therefore it is imperative to control for future growth when testing the effect of current growth on income distribution.[4]

We analyze the wealth and pay-for-performance hypotheses using post-war era (1953–2008) data,[5] using the recently constructed database of Piketty and Saez (2003, 2006), which consists of annual series of US families' tax filings. The primary advantage of this database is that it includes income sources and covers many consecutive years. To alleviate concerns of endogeneity, correlated omitted variables, and correlation in the dependent and independent variables over time, our empirical analysis is based on changes. Specifically, we examine the relation between *changes* in incomes (of different groups) and *changes* in average per capita incomes (i.e., per capita growth). Further, our research setting allows us to abstract from country-wide differences that exist in panel studies of the income inequality – growth relation.

The empirical results show that the change in income of the top 1% group is approximately twice as sensitive to concurrent GDP per capita growth compared to that of the lower 90% group. We also find that the change in income of the top 1% and 5% groups is highly sensitive to variation in next year's GDP per capita growth, while the change in income share of the lower 90% group is negatively correlated with next year's GDP per capita growth. Similarly, as postulated by the wealth and pay-for-performance hypotheses, the income of the top groups is more sensitive to changes in the market return. Overall, these results strongly suggest that, in the US, higher growth rates and positive shocks in future growth rates tend to increase income inequality.[6]

To mitigate identification problems, we augment the analysis with two additional research designs. First, we follow Dollar and Kraay (2002) and use a two-stage instrumental variables approach, and second, we use a dynamic model in which changes in both income inequality and US GDP per capita growth are determined simultaneously. The results are robust and indicate that current GDP per capita growth increases income share of the top 1% and reduces the income share of the bottom 90%. Further, we find no significant effect of changes in income inequality on current GDP per capita growth.

Having established positive relation between growth and inequality, we next analyze whether this positive relation is explained by the wealth and the pay-for-performance hypotheses. The data of Piketty and Saez allows us to partition the incomes of the 90–95% group, the 95–99% group, and the top 1% group into labor and wealth income, and examine their sensitivities to current GDP per capita and market return.[7] The wealth hypothesis predicts that wealth income is more sensitive to

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[3] The multiplicative effect that we refer to can be illustrated by the growth model: the present value of cash flows of the US economy can be described by $\frac{GDP_1}{r-g}$, where GDP_1 is Gross Domestic Product next year, r is the discount rate, and g is the growth rate. Assume that initially the GDP growth rate is constant at g = 3%. Now consider two cases: (1) the country exhibits a permanent 10% shock to GDP growth (to 3.3%) and (2) the shock is transient and occurs only for one year (g does not change but GDP_1 increases by 3.3% compared to GDP_0). Empirically, the two cases are indistinguishable by observing GDP_1 alone. However, according to the growth model, the permanent shock has an immediate multiplicative effect on the value of the economy (assets and human capital in the economy). As a result, a researcher who only incorporates the time t growth of GDP in the analysis of the income distribution at time t is downward biasing the effect of the growth process on incomes.

[4] Of course, while the income of the top income groups may be more sensitive to future growth rates and by extension to stock market returns, it is also subject to greater volatility that is unrelated to GDP growth. In particular, because the market return is associated with price factors that are unrelated with future US growth rates, the income return of the top income groups (compared to that of low income groups) can deviate more often from the trajectory of US economic growth.

[5] We analyze data after the Korean War because of data limitations from earlier years and because we want to abstract from major structural changes that occurred during the period around World War II. For example, the war period was accompanied by tight labor markets, rising union strength, and substantial government intervention in the labor and product markets (Frydman and Molloy, 2011).

[6] Note that these two effects, current growth rate and shocks to expectations in future growth, tend to be negatively correlated. Thus, when current growth rate is relatively high, shocks in expectations to future growth rates tend to be negative more often, compared to periods when the current growth rate is relatively low.

[7] Wealth income is not available for the bottom 90% group; however, this is without loss of generality, as the lower 90% group's has very little wealth so their income comes almost in its entirety from labor.