Should Policymakers Care Whether Inequality Is Helpful or Harmful For Growth?

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The view that inequality is harmful for growth is gaining currency among policymakers around the world. In the strongest form of this argument, high levels of inequality can make sustained growth impossible or even cause recessions. In a weaker form, lower levels of inequality are good for growth. Among policymakers this view has almost entirely supplanted the traditional economic view that there was a tradeoff between inequality and growth and that greater inequality might be the price to be paid for higher levels of growth.

This paper is not a fresh attempt to assess the empirical evidence on inequality and growth or a survey of the existing literature. Instead this paper addresses the question of whether policymakers should even be interested in this question in its traditional form, answering with a resounding no for three reasons.

First, although more recent papers have reached the conclusion that exogenously higher levels of inequality result in lower longer-run growth rates, a number of studies have found more nuanced and complicated results, the magnitude and importance of inequality is not so high that it deserves a special place as an explanatory variable, and in general cross-country growth regressions are inherently limited in their ability to make definitive and robust causal claims.

Second, and more importantly, with few notable recent exceptions, the literature is about the impact of inequality on growth not the impact of policies to reduce inequality on growth. The former is of interest to social scientists and historians but it is the latter that is relevant for policymakers.

Third, and fundamentally, the question itself is mis-specified, at least from the perspective of policymakers. From a normative perspective most policymakers do not care about the average of incomes in the economy—which is the left-hand side variable posed in most of this literature—which accords equal weight to $1 added to the income of a poor person or a billionaire. Most social welfare functions would place more weight on the bottom than on the

top. Certainly politicians generally like to talk about the impact of their policies on "the middle class" or the poor or some other group, not simple the arithmetic average across the population. So even if inequality was bad for growth, it still might be good for growth of social welfare in the relevant normative sense.

The aggregate question posed in much of the literature is not convincingly answerable, policy focused, or normatively relevant. Instead more research should focus on developing and analyzing left-hand side variables that are normatively relevant, from simple ones like median income, the income of the bottom quintile or the mean of log income to more complicated aggregates like the Organisation of Economic Cooperation and Development (OECD)'s Multi-dimensional Living Standards (Boarini, et al. 2016). Moreover, the right-hand side variable of interest are not inequality in the aggregate but specific policies that might increase or reduce inequality.

Policies that reduce inequality while increasing growth—and there are many—are clearly worth prioritizing. But in many cases, there are tradeoffs that need to be evaluated based on the magnitude of the tradeoff and a social welfare function. The answer will vary area by area but I provide some examples and evidence that suggest that in advanced economies a lexicographic framework that focuses exclusively on distributional analysis and then only to growth when the distribution of different policies is the same is generally likely to be appropriate under a broad range of social welfare functions. This is because the distributional effects of many policies are orders of magnitudes larger than the growth effects. In developing economies, however, the scope for policy- and institutionally-induced variations in growth rates is much larger and thus the lexicographic approach is unlikely to be as widely appropriate.

The first part of this paper answers the question in the title of the paper—discussing the ways in which many of the existing approaches to answering the question of the impact of inequality on growth are misguided. In the second part of the paper I discuss some policy areas where reducing inequality and growth are complementary and also how to evaluate tradeoffs between them, developing a specific example from the analysis of tax cuts and talking more broadly about the aggregate macroeconomic evidence and how it might be similar or different between developing and advanced economies.

Aggregate Analysis on the Impact of Inequality on Growth

Many surveys have considered the ways that inequality could help or hurt growth so this is not the place to repeat them at length. Traditionally more of an emphasis was placed on ways that inequality could help growth. From a macroeconomic perspective, Nicholas Kaldor (1955) argued that because higher-income households saved more, more skewed incomes would increase national savings, capital accumulation, and thus the level of output. The traditional microeconomic argument is that inequality provides an incentive for greater investments in human capital, risk-taking and entrepreneurship, all of which are critical for growth (Mirrlees 1971; Lazear and Rosen 1981).

On the other side, a number of arguments have been put forward about ways in which inequality is harmful for growth including cutting off segments of the population from the education they would need to be maximally innovative (Bell, et al. 2016), reducing trust and thus requiring more inefficient contracts (Stiglitz 1974; Bowles 2012), making it harder to take risks because the consequences of failure can be even larger, and leading to political instability and economically harmful policies (Alesina and Perotti 1996; Keefer and Knack 2002).

A steady stream of papers have attempted to empirically estimate the answer to this question. The aggregate literature starts with Alesina and Rodrik (1994), runs through a spate of papers in the late 1990s and early 2000s, and has recently been revived with notable contributions by the IMF and OECD. On balance this literature, much of which has been summarized elsewhere (e.g., Cingano 2014 and Boushey and Price 2014), has more often found that inequality is harmful to growth than helpful to growth, although the conclusion has varied a lot from paper to paper. Findings from a number of papers also suggest differential effects by a country's level of development, with inequality having a negative impact on growth for poorer countries and an insignificant, or even positive, effect for richer countries (e.g. Deininger and Squire 1998; Barro 2000; Forbes 2000; Knowles 2005; Castelló 2010).

This literature, like all cross-country growth literature, is in some ways the best we can do in answering aggregate, general equilibrium questions. But like all cross-country growth regressions, it struggles with untangling causation from correlation, noisiness and comparability of data, and the degrees of freedom problem when there are fewer countries than there are explanations of inequality. Although instrumental variables are used to find plausibly exogenous

variations in inequality, the weakness of the instruments has raised doubts about the results (Kraay 2015).

As a social scientist if forced to answer the question of the effect of inequality on growth—recognizing the inevitably limited evidence and absence of anything resembling convincing causal identification—I would bet on inequality being harmful to growth. As a policymaker, however, I would not find that conclusion particularly useful for any particular decisions or broader prioritization. In part this is because the lack of certainty about the evidence and the fact that even in these results reducing inequality is not necessarily the most important factor for boosting growth and reasonable reductions in inequality do not result in large increases in growth. This is not to say that reducing inequality is not good, just that these empirical estimates give little reason to argue that the motivation for such reductions should be to achieve higher growth.

More importantly, however, the interpretation of the cross-country research has suffers from two other issues: the interpretation of the right-hand side variable of inequality and the meaningfulness of the left-hand side variable of growth.

The Right-Hand Side Variable: Inequality

The right-hand side variable in almost all of this empirical work is inequality itself, not redistribution—with the notable exceptions of Ostry, Berg and Tsangarides (2014) and OECD (2015) who examine the impact of both inequality and redistribution as measured by the difference between the Gini index for market income and the Gini index for post-tax and transfer income. In part, this focus has been the result of data limitations, until recently there were not comprehensive datasets that included measures of redistribution—and even now there are serious questions about the noisiness of those measures (Wittenberg 2015). However, it also reflects researchers' focus on a social science question—why do some countries grow more than others—rather than a policy relevant question.

To illustrate the difference, imagine a literature that tried to figure out whether it was better for a country to have an asset-to-GDP ratio of 75 or a debt-to-GDP ratio of 75. Undoubtedly it would find that the former is better than the later. Everything else being equal, what country would not prefer to have a sizeable asset to a meaningful debt? It would not follow,

however, that the right policy for a country with a 75 percent debt-to-GDP ratio would be to run large surpluses until it ended up with a 75 percent asset-to-GDP ratio.

Most of the literature and speculation on the aggregate impact of inequality is similar. One example is Alesina and Rodrik (1994), the paper that started the modern literature on the impact of growth on inequality. That paper found a statistically significant, economically meaningful and robust negative impact of inequality on growth—the relevant conclusion for social scientists seeking to understand growth. But the model underlying the paper provided exactly the opposite lesson for policymakers. Specifically, Alesina and Rodrik model had two features. The first feature of the model is that redistribution is economically inefficient, reducing growth (in their model, this is because the instrument of redistribution is capital taxation). The second feature of the model is that the greater degree of inequality the more a government will engage in redistribution (in their model, the median voter is decisive and her difference from the mean voter determines the magnitude of redistribution).

In the Alesina-Rodrik model inequality is only bad for growth because it leads policymakers to undertake policies that are bad for growth. The same types of features persist in models up through today, for example Halter, Oechslin and Zweimüller (2014) have a model in which greater inequality leads the median voter to want more transfers at the expense of less investment in long-term public goods and thus less long-run growth. They too find that in the long-run inequality is detrimental to growth.

If these models are taken seriously they suggest two lessons for policymakers. The first is that you are better off being born in a country that is endowed with a low level of inequality, which is about as useful as the advice that it is better to start with a large public asset than a large public debt. The second lesson, however, is that if your goal is to maximize growth then you should *not* try to reduce inequality—either through the tax system (Alesina and Rodrik) or the transfer system (Halter, Oechslin and Zweimüller)—because that would be bad for growth. That is precisely the opposite of the naïve interpretation of the headline empirical finding that inequality is bad for growth. Moreover, these particular models do not admit an "efficient" way to redistribute and if they did, they would no longer explain their empirical finding that inequality is bad for growth. Effectively, these models are subject to the Lucas critique that if you try to exploit the reduced form relationships they find in the data, the relationship will go away.

I am not arguing that to the degree inequality is associated with lower growth these models offer the correct interpretation. Consider an alternative model which has two features: policies to engage in upward redistribution through rent seeking and foreclosure of creative destruction are harmful to economic growth and the greater the magnitude of inequality, the more powerful elites will be (this is not too far from the work of Daron Acemoglu, Simon Johnson and James Robinson, see e.g., Acemoglu, Johnson, and Robinson 2001). Such a model would be observationally equivalent to the Alesina and Rodrik or Halter, Oechslin and Zweimüller models in the cross-country growth literature. But it would have exactly the opposite conclusions, both about political economy (it would imply that to maximize growth, elites power should be limited) and about policy (inequality-increasing policies themselves are bad for growth).

The purpose of this is not to take a stand on which of these interpretations is correct, just to suggest some of the limits of the policy relevance of the aggregate research and encourage more research on the specific links in the argument. Or at least promote more clarity about what results are relevant to social scientists and what results are relevant to policymakers.

Some of the policy questions are discussed in the next section, but before getting there I wanted to talk about the left-hand side variable: economic growth.

The Left-hand Side Variable: Economic Growth

An even more fundamental issue about the question of whether inequality is good or bad for growth is that growth itself has limited normative usefulness as a guide to public policy. In part this is for broadly accepted and conceptually straightforward reasons that growth is the not the same as welfare. A policy that raises GDP by 1 percentage point by having everyone work harder will not increase everyone's welfare by 1 percentage point after accounting for the cost of the lost leisure. For this reason, optimal policies in areas like public finance and regulatory policies are generally based on welfare analysis or cost-benefit analysis not a simple GDP maximization exercise. As discussed below, this can be particularly relevant in assessing tax policies—especially when they present tradeoffs between growth and inequality—because the welfare benefits can be only about one-quarter of the headline growth effects.

More important is the fact that growth rates record the growth of the arithmetic average of individual or household incomes. This reflects one particular social welfare function in which

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$1 of income is equally good whether it is added to a billionaire or a poor person. Similarly, under this metric a policy that raised a billionaire's income by $1,000 while lowering everyone else's by a combined $500 would be preferred to one that provided $400 evenly divided across the income distribution. This, of course, does not reflect the social welfare function that most policymakers would defend—policies are more often advocated based on their purported benefits for the middle class, rather than the claim that while they hurt the middle class that harm is outweighed by the benefits for billionaires. The view that $1 is equal at every income level is also inconsistent with the way individuals treat risk and marginal additions to their income.

Unfortunately, however, there is no unambiguously accepted social welfare function. One simple summary statistic would be to use median income instead of mean income, which has the virtue of being understandable to policymakers and may capture more of the normatively-relevant changes in well-being than mean income. Of course, such a measure also throws out a tremendous amount of information about how incomes are changing for everyone who is not at the median.

An economist's first instinct might be to reach for the mean of log income. This metric reflects a particular way to combine growth and inequality, with a mean-preserving spread of incomes (i.e., greater inequality) lowering the indicator. In particular, it corresponds to the normative assumption that a 10 percent increase in income for a lower-income household is equivalent to a 10 percent increase in income for a higher-income household. There is some evidence from household-level and cross-country data that this is a reasonable description of the way people view their own satisfaction (Stevenson and Wolfers 2008). The evidence, however, does not rule out other possibilities for the curvature of the utility function.

A large literature on how people respond to risk finds the coefficient of relative risk aversion somewhere in the range of 1 to 4, with 2 being a general consensus value. This suggests that someone would be willing to give up somewhat more than 10 percent of their income in a high-income state to protect against a 10 percent loss of income in a low-income state. To the degree this intrapersonal experience is used as a basis of social welfare comparisons, it would suggest that the change in log income would understate the costs of inequality. Moreover, long-standing ethical arguments have advanced the proposition that the interpersonal comparison should be based on a greater degree of risk aversion than is empirically associated with individuals. In the extreme, infinite risk aversion would lead to the Rawlsian view that changes

in welfare should be judged by the change for the worst-off person (Rawls 1971). In practical terms, such a welfare metric might correspond to looking at the change in income for the bottom quintile, a measure that has the benefit of being comprehensible to policymakers, like median income.

The Atkinson (1970) generalized mean provides a flexible framework that encompasses all of these alternative metrics. Most importantly, it allows policymakers to choose a normative parameter that reflects the weight that they put on changes in different parts of the income distribution, which can range from 0 (which corresponds to mean incomes) to infinity (which corresponds to the Rawlsian case), with values of 1.5 (roughly corresponding to median income) and 50 (roughly corresponding to the bottom quintile) often employed (Boarini, Murtin, Schreyer, and Fleurbaey 2016). Such measures, however, have the disadvantage that they are not readily understandable by policymakers are not readily available.

Recent efforts by the OECD build on the Atkinson index to also incorporate the ways in which people value longevity and are averse to a greater risk of becoming unemployed, combining these measures together into Multi-Dimensional Living Standards (Boarini, Murtin, Schreyer, and Fleurbaey 2016). This measure moves even closer to a welfare-relevant metric, but at the cost of being even less intuitively meaningful to policymakers. Moreover, it places a lot of weight on mortality—which may correctly reflect individual preferences but has the downside of varying a lot based on factors beyond the traditional considerations.

If all of these measures generally moved together then these considerations would be purely theoretical. Dollar and Kraay (2002) found that the level and growth of GDP is highly correlated with the level and growth of the bottom quintile in a large sample of countries. If you are only interested in the relative well-being of the bottom 20 percent across the Central African Republic, Brazil, and the United States, comparing GDP per capita will give you a reasonable approximation. But the differences among the Central African Republic, Brazil and the United States are much greater in magnitude than what could be driven by policy choices, especially in rich countries with relatively mature economic institution over any relevant time horizon. In the case of the advanced economies, in particular, aggregate growth rates are a poor proxy for alternative normative metrics.

An illustration of these differences is provided by Table 1 which shows growth rates for the G-7 countries from 1995 to 2015 or the closest available dates. The United States is tied with

the United Kingdom for the highest growth rate in GDP per capita over this period but is near the bottom of the group in the growth of the incomes of the bottom 20 percent, the median household, and the OECD's two measures of Multi-Dimensional Living Standards. The measure of the change in log income—measured indirectly using the change in income and the change in the Gini coefficient under the assumptions that incomes are log-normally distributed (Stevenson and Wolfers 2016)—shows a different trend as well.

Table 1

Annualized Growth Rates of Alternative Measures of Economic Growth in G-7 Countries, 1995-2015

	GDP per Capita	Bottom Quintile Average Household Income	Median Household Income	OECD Multi-dimensional Living Standards Poorest 10 % of Households	Median Household	Mean Log GDP per Capita
Canada	1.4	0.4	0.7	3.0	3.4	1.3
France	1.0	0.7	0.6	2.4	2.7	0.9
Germany	1.3	-0.2	-0.2	2.4	2.6	0.6
Italy	0.2	1.1	0.3	0.9	1.3	-0.1
Japan	0.8			1.1	1.4	0.5
United Kingdom	1.5	2.0	1.8	2.8	3.4	1.7
United States	1.5	0.0	0.3	1.5	2.4	1.2

Note: Bottom quintile and median household income are from 1994-2010 for Canada, France, and Germany; from 1995-2010 for Italy; and from 1994-2014 for the United Kingdom and United States. Mean log GDP per capita is from 1995-2014.
Source: Organisation for Economic Co-operation and Development; Gornick, et al. (2016); Solt (2016); author's calculations.

Moreover, the relevant question for policymakers is not whether the level or growth of incomes is correlated with the level or growth of these welfare-based measures. This is still the example of the Central African Republic versus the United States. Instead, the relevant question is: What is the impact of a *policy-induced change* on the change in average incomes and these other welfare measures? To the degree that one is considering policies that create tradeoffs between growth and distribution—which is the only question that requires thinking through these issues—then the correlation in the policy-driven deltas on these different metrics might be even lower than in the aggregate data.

Evaluating Particular Policies That Affect Inequality and Growth

There is no unambiguously correct metric for assessing policies. But ultimately policymakers are concerned with the question of how a given policy intervention affects the

well-being of the bottom quintile or the typical citizen or the bulk of the middle class or possibly in some rare cases (the exceedingly rational policymakers in Singapore?), mean log income.

This question shifts the focus from broader macroeconomic considerations to the more microeconomic analysis of specific policies. Posed this way, it is clear that there is no one answer to the question. Clearly there are policies that help both growth and inequality, education being one widely accepted example. There are also inequality-reducing policies that dramatically reduce growth, likely making everyone worse off—with Venezuela being just the most vivid recent case. And there are policies that might result in a small reduction in growth rates (measured in the conventional manner), but, by reducing inequality, would actually increase the growth of living standards for the bulk of citizens. The fact that policies in the real world reflect a mixture of all of the above is another reason to believe that there is no single and true answer to the question of whether inequality is good or bad for growth.

All-Good-Things-Go-Together Policies

The easiest case is policies where all good things go together, increasing growth rates (or creating a one-time increase in the level of output) and reducing inequality. Such policies are worth adopting on any of the metrics for adopting them. There appear to be a wide range of such policies, perhaps wider than policymakers had traditionally considered.

One of the strongest cases for an all-good-things-go-together policy is in education. This is clearly the case for reforms that do not cost money, for example reforms to improve the quality of K-12 education or shifting to a more Australian-like system of income-based repayments for higher education. Many reforms that do cost money, for example expanded preschool in the United States, would also likely generate economic benefits that exceed the deadweight loss associated with the taxes to fund them (CEA 2014).

Recent research and policy debates around the issue of competition point in a potential direction for expanding the possibilities of all-good-things-go-together policies. Specifically, this research identifies a number of ways in which imperfect competition in labor or product markets is leading to increased inequality—the so called "rise of rents" (Stiglitz 2012, Furman and Orszag 2015; Barkai 2016) Moreover, the same lack of competition that gave rise to these rents also may be inhibiting investment and innovation (Gutiérrez and Philippon 2017 and Gilbert

2006; Aghion, et al. 2005) To the degree that greater competition can reduce these rents that could improve both the distribution of income and efficiency.

This could be relevant in product markets, for example through more vigorous antitrust policy, less strict intellectual property policies, or increased consumer ownership of their data. It also could be relevant in labor markets, where efforts to combat collusion, reduce non-competes agreements, or increase the minimum wage or unionization, have the prospect of not only reducing inequality but also of reducing or redistributing rents in a manner that is efficiency neutral or even efficiency improving.

Policies that improve either growth (conventionally measured) or inequality without worsening the other metric would also fall into this category. Revenue neutral business tax reform, for example, has the prospect of raising the level of output with no meaningful impact on the distribution of income. Other growth-enhancing measures like infrastructure or expanded research might affect the distribution of income but in ways that have been little studied and could reasonably be considered second order for this purpose.

Evaluating Tradeoffs—the Example of Tax Reform

While one might debate whether specific policies truly belong in the all-good-things-go-together category, there is no debate that policies in this category are worth pursuing. The trickier question is when policies cause a tradeoff. To understand how to evaluate tradeoffs in theory and how they actually work out in practice I will examine a toy example from tax policy that reflects the canonical tradeoff between output and distribution generally assumed in the public finance literature (although not necessarily universal, see for example Zidar 2017 on evidence that tax cuts for lower-income households might have larger effects on employment than tax cuts for higher-income households).

Specifically, consider a 10-percent reduction in labor taxes paid for by a lump-sum tax in the Ramsey framework put forward by N. Gregory Mankiw and Matthew Weinzierl (2006). Under these parameters, this policy would increase output by 1 percent and raise welfare by an amount equivalent to a 0.5-percent increase in consumption in the long run for the representative agent (the welfare increase is lower because of the cost of foregone leisure).[1]

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[1] See Furman (2016) for details underlying these calculations.

The representative agent case, of course, is not particularly relevant for assessing the distributional impacts of public policy. To do that I drop the representative agent assumption and apply this tax policy to the actual distribution of U.S. incomes in 2010. In this case essentially all households see an increase in their before-tax labor incomes—just as in the representative agent case, as shown in Table 2. But two-thirds of households see an increase in their taxes, as the $900 lump-sum tax needed to finance the rate reduction (net of the dynamic feedback effect of 12 percent) is larger than the 10 percent rate reduction. For example, consider households in the second quintile. On average they would see a $570 net increase in their taxes from the shift to lump sum taxation—which would not be offset by the additional $180 they earned working more hours.

Table 2
Economic Effects of Shifting from a Hypothetical 25%
Proportional Income Tax to a 22.5% Labor Income Tax,
25% Capital Income Tax, and $900 Lump-Sum Tax

	Percent of Households
Before-Tax Income Increase	96
Tax Increase	67
After-Tax Income Increase	46
Welfare Increase	41

Note: Aggregate economic impacts are computed using the macroeconomic model of Mankiw and Weinzierl (2004, 2006). Values for individual families are assumed to change by the same percentage as the aggregate values. The distribution of income is derived from the 2010 IRS Statistics of Income Public Use File. See Furman (2016) for additional details. Utility is computed as $\log$(after-tax income) - $n^{(1+1/\sigma)}$, where n is the value of labor supply generated by the Mankiw-Weinzierl model (assuming an isoelastic specification of labor disutility).
Source: Furman (2016).

Overall, taking both of these into account only 46 percent of households see an increase in their after-tax incomes. This is not the only consideration for welfare. In the case of the middle quintile, for example, the increased earnings and the increased taxes roughly offset each other but with work hours up 1 percent, the overall impact on utility would be equivalent to a 0.6 percent reduction in consumption. Families in the top two quintiles, however, would be better off on average.

To map this back into the framework discussed above, while mean after-tax income rises by 1 percent the log of after-tax income falls by 1 percent, as shown in Table 3. Using the utility function assumed in the model and assuming these utilities are interpersonally, additively comparable, then welfare also declines. The same is also true of a social welfare function that uses the log of utility to effectively place less weight on the utility of higher-income households than lower-income households.

Table 3
Economic Effects of Shifting from a Hypothetical 25% Proportional Income Tax to a 22.5% Labor Income Tax, 25% Capital Income Tax, and $900 Lump-Sum Tax

	Baseline (25% Flat Tax)	Alternative (22.5% Labor Tax + $900 Lump Sum)	**Percent Change**
Income			
Mean After-Tax Income	50,221	50,788	**1.1**
Log After-Tax Income	10.2	10.1	**-1.0**
Welfare			
Mean Utility	10.00	9.89	
Mean Log of (Utility + 1)	2.39	2.36	

Note: Aggregate economic impacts are computed using the macroeconomic model of Mankiw and Weinzierl (2004, 2006). Values for individual families are assumed to change by the same percentage as the aggregate values. The distribution of income is derived from the 2010 IRS Statistics of Income Public Use File. Utility is computed as $\log(\text{after-tax income}) - n^{(1+1/\sigma)}$, where n is the value of labor supply generated by the Mankiw-Weinzierl model (assuming an isoelastic specification of labor disutility). See Furman (2016) for additional details.
Source: Furman (2016).

These results do not provide an answer to the question of whether this tax policy is a good idea. But I suspect that most of the policymakers who might otherwise have been attracted to the promise of the higher growth associated with this particular reform would overall object to the policy if they understood that this growth was achieved by higher taxes on two-thirds of households, a policy that would leave the median household working harder to earn about the same after-tax income.

Importantly, these results generalize to a large class of tax policies. In general, and oversimplifying somewhat, in most models greater growth can only be achieved by making the tax system less progressive. The traditional revenue-neutral, distribution-neutral tax reform will

leave the effective tax rate on labor income unchanged.[2] Moreover, the growth effects of tax changes are about an order of magnitude smaller than the distributional effects of tax changes— and the disparity between the welfare and distribution effects is even larger. For example, Treasury's analysis of the 2005 Bush Tax Reform Panel's Simplified Income Tax plan found it would increase national income by 0.2 to 0.9 percent in the long run and Altig et al. (2001) found that a flat tax with transition relief would increase national income by 2 percent in the long run. These are similar in magnitudes to a wide range of estimates from official organizations of recent tax proposals as shown in Table 4.

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[2] Such a reform lowers the statutory tax rate but also raises the after-tax price of items the person would like to buy, like mortgages, charity and healthcare. As a result the effective rate is essentially unchanged—although the details depend on the income elasticity of specific base broadeners and how behavior works in practice.

Table 4
Select Estimates of the Effect of Tax Reform on the Level of Output

Source	Policy Change	Short-Run	Long-Run
Gravelle (2014)	Stylized Reform: 20% Reduction in Income Tax Rates	n. r.	0.7 - 4.0
JCT (2014)	Camp Plan	0.1 - 1.6	n. r.
Treasury (2006b)	President's Advisory Panel on Tax Reform		
	Simplified Income Tax	0.0 - 0.4	0.2 - 0.9
	Growth and Investment Tax	0.1 - 1.9	1.4 - 4.8
	Progressive Consumption Tax	0.2 - 2.3	1.9 - 6.0
Treasury (2006a)	Permanent Extension of the 2001/2003 Tax Cuts		
	Financed with Future Spending Cuts	0.5	0.7
	Financed with Future Tax Increases	0.8	(0.9)
JCT (2005)	Cut in Federal Individual Income Tax Rates		
	(4.0% in first decade, 2.9% thereafter)	0.0 - 0.5	(0.2) - (0.6)
	Not Financed	0.1 - 0.3	0.3 - 0.4
	Financed with Future Spending Cuts		
	20% Cut in Federal Corporate Tax Rate		
	Not Financed	0.2 - 0.4	0.0 - 0.3
	Financed with Future Spending Cuts	0.2 - 0.4	0.5 - 0.9
Dennis et al. (2004)	10% Cut in Federal Individual Income Tax Rates		
	Financed with Future Spending Cuts	0.2	(0.4)
	Financed with Future Tax Increases	0.3	(2.1)
Altig et al. (2001)	Stylized Revenue-Neutral Tax Reforms		
	Flat Tax with Transition Relief	0.5	1.9

n. r. = Not reported. Red indicates negative values.
Note: Output measure is (in order of preference if multiple measures are reported) national income, real gross national product, and real gross domestic product. Time period for short-run effects varies across studies, but (in most cases) is an average over several years in the first decade. Long-run effects typically reflect estimates of the change in the steady state level of output.
Source: Furman (2016).

In contrast, Table 5 shows the impact on after-tax incomes of the cumulative tax and spending changes from 1986 to 2013, showing that these can easily raise or lower incomes by 6 or even 12 percent. Expanded tax credits and health insurance subsidies enacted in 2009 and 2010, for example, raised the after tax income of the bottom two quintiles by 18 and 6 percent

respectively (CEA 2016). No mainstream modelling of a tax plan has an effect close to as large, let alone one that would take effect immediately.

Table 5
Change in After-Tax Income due to Changes in
Average Tax Rates by Income Percentile, 1986 to 2013

Income Percentile	Percent Change
0-20	6.6
20-40	7.1
40-60	6.5
60-80	4.5
80-90	2.7
90-95	0.7
95-99	-3.4
99-100	-12.4

Note: Net of tax rate is 100 minus the average tax rate. Change in after-tax income due to changes in average tax rate is the percent change in the net of tax rate.
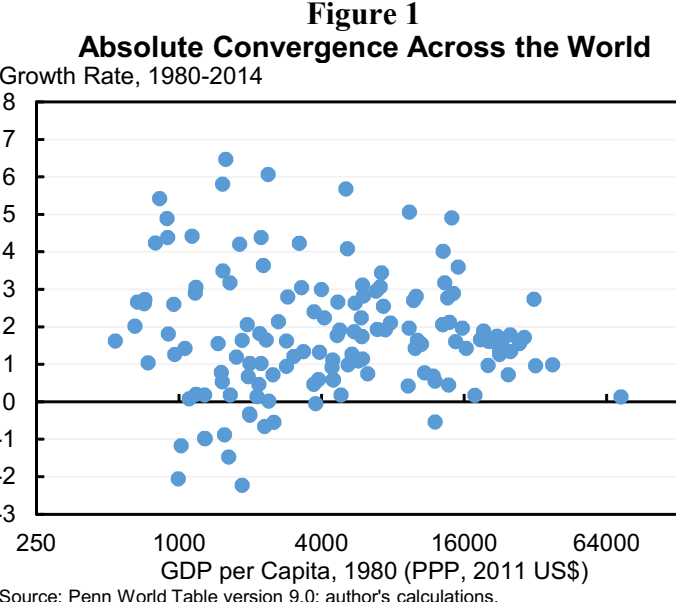Source: Furman (2016).

The implications of this are that a welfarist analyzing tax policies that entail tradeoffs between efficiency and equity would not be far off in just looking at static distribution tables and ignoring any dynamic effects altogether. This is true for just about any social welfare function that places a greater weight on absolute gains for households at the bottom than at the top. Under such an approach policymaking could still be done under a lexicographic process—so two tax plans with the same distribution would be evaluated on the basis of whichever had higher growth rates (e.g., a reformed business tax system versus the status quo). But in this case growth would be the last consideration, not the first.

Does the Tax Reform Example Generalize to Other Policies?

Analyzing tax policies has the advantage of drawing on a broad set of theoretical and empirical models that integrate output, distribution, and welfare. In most other domains of policy we do not have anything close to this. Nevertheless, I would speculate that the lexicographic approach of considering distribution first and then growth is likely broadly applicable to the types of policy decisions facing the advanced economies but unlikely to be broadly applicable to the types of policy decisions facing the emerging economies.

The logic for the speculation that policymakers in advanced economies should effectively prioritize distribution while policymakers in emerging markets should balance the two comes from that fact mature economies have relatively small variations in their growth rates while less mature ones have much wider variations. As shown in Figure 1 which plots annual growth rates for 1980 to 2014 against per capita income levels in 1980 for all the non-oil economies for which data is available, lower-income countries have exhibited substantial variations in per capita annual growth rates that are largely not explained by convergence (Pritchett 1997). In contrast, higher-income countries have all had much more similar growth rates, with even the smaller differences explained largely by convergence as the initially lower-income countries caught up with the higher-income ones.

Figure 1
Absolute Convergence Across the World

Source: Penn World Table version 9.0; author's calculations.

Overall, the interquartile range of growth rates for the countries that met the World Bank's classification for low- or middle-income at the beginning of the period was 2.1 percent while for high-income countries it was 0.5 percent. Looking at the residuals from a regression of per capita growth rates on log per capita initial incomes, the respective interquartile ranges are also 2.1 percent and 0.5 percent.

These numbers provide an indicative sense of the upper-bound on policy shifts. For an advanced economy moving the tax, regulatory, legal, educational, trade and other policies from the 25th percentile of peer countries to the 75th percentile of peer countries would be a herculean

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effort. And the fact that the growth rates between these percentiles vary by a few tenths annually suggests the difficulty of achieving much larger growth effects from such a policy.

This exercise does not establish bounds on the impact of policies. On the one hand, these ranges could overstate the plausible impact of policy changes if luck or endowments had a substantial impact on growth rates. On the other hand, if countries have offsetting collections of good and bad policies then just shifting all policies in a good direction could have a larger impact on growth than is found in actual sample of countries. Nevertheless, it appears consistent with a much wider scope for policies to impact growth rates in developing countries than in advanced economies.

Overall, the fact that the United States and France have nearly identical levels of productivity despite the fact that France fares considerably worse on most measures of regulation is just a vivid example of the fact that for mature economies with mature institutions the difference in growth rates that results from different policies is considerably lower than one might suspect. This is true both based on bottom-up estimates of the growth impacts of individual policies and the top-down analysis presented here of the difference in growth rates across the advanced economies.

Conclusion

The question of whether inequality is good or bad for growth is an interesting and important one that deserves time and attention from social scientists, although I am skeptical it will ever lend itself to a clear answer because the many different sources of inequality may have many different impacts on growth.

The interests of policymakers are different from the interests of social scientists. Policymakers are concerned not with inequality per se—which they cannot choose—but with policies that affect inequality. And they are, or at least profess to be, not concerned with growth but with how the policies they pursue affect their population, understood variously as the median income, the bottom quintile, the average income for the bottom 90 percent, or the many other metrics that draw on information from across the distribution.

Policies exist in all quadrants of the two-by-two matrix: good for both growth and distribution, good for one but not the other, or bad for both. Two of those quadrants are straightforward—policymakers should be working to identify all-good-things-go-together policies and avoid the opposite. In the case of tradeoffs, the answer is less obvious but as an empirical matter it is plausible that a number of policies in advanced economies have first order distributional impacts but only second order effects on growth—suggesting that policymakers focused on just about anything except for mean incomes would be better off evaluating their merits solely only the basis of the static impact on distribution.

It is plausible that a flat tax, for example, might have boosted U.S. growth—but by only a tenth or two annually which would not be enough to materially change the results from just looking at the direct effect of the tax change on incomes. In contrast, just about anyone would take China's deal of higher growth rates plus higher inequality—including the more than 800 million people lifted out of extreme poverty in China since 1980.

Going forward, as we continue to rethink macroeconomics, better incorporating welfare and distributional considerations into models and understanding how they relate to specific policy instruments. The fact that we cannot agree on the appropriate social welfare function is not an argument for choosing one particular social welfare function—the average of incomes—that is inconsistent with the way most policymakers describe their ultimate goals.

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