

WP 18-4 Slower Productivity and Higher Inequality: Are They Related?

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Abstract

Income growth for typical American families has slowed dramatically since 1973. Slower productivity growth and an increase in income inequality have both contributed to this trend. This paper addresses whether there is a relationship between the productivity slowdown and the increase in inequality, specifically exploring the extent to which reduced competition and dynamism can explain both of these phenomena. Productivity growth has been uneven across the economy, with top firms earning increasingly skewed returns. At the same time, the between-firm disparities have been important in explaining the increase in labor income inequality. Both of these findings are consistent with the observed reductions in competition, as evidenced by increasing concentration and economic rents, and business dynamism. We also explore the scenarios under which government policies can help mitigate, or contribute to, declining competition and dynamism.

JEL Codes: D24, D31, D40, E25, K20, L40

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Introduction

The most important development in the U.S. economy over the past forty years has been the deceleration in the typical household's income—a trend also experienced by many other advanced economies. From 1948 to 1973, real median family income in the United States rose 3.0 percent annually. At this rate, incomes doubled once a generation and there was a 96 percent chance that a child would have a higher income than his or her parents. Since 1973, the median family has seen its real income grow only 0.4 percent annually, a rate at which it would take over a century to double. As a result, 28 percent of children have lower income than their parents did.

The slowdown in income growth can be traced to two simultaneous developments (see also Stansbury and Summers paper from this conference). The first is the decline in productivity growth, with output per hour growing at a 2.8 percent rate in the earlier period and a 1.7 percent rate since 1973. The performance in the past decade has been even worse, with productivity increasing at only a 1.2 percent annual rate. The second development has been the rise of inequality. From 1948 to 1973, the share of income going to the bottom 90 percent of Americans was roughly steady at about two-thirds but has fallen steadily since then, to just over half today. The combination of a slower growing pie that is more unequally divided has posed a double blow to typical families.

This paper explores whether the fall in productivity growth and the rise in inequality are related. One possibility is that slower productivity growth is causing rising inequality. In the traditional competitive explanation for rising inequality, an increased demand for skills in the form of skill-biased technological change was met by a deceleration in the supply of skills due to less rapidly growing educational attainment, increasing the relative wages of skilled workers (Goldin and Katz 2008). This model explains much of the increase in earnings inequality through about 2000 but still leaves important aspects of earnings inequality unexplained, especially more recent trends and inequality at the very top of the income distribution. Importantly for this purpose, this model would predict that slower productivity growth would result in less skill-biased technological change and thus a reduction in inequality. So, the traditional competitive theories of inequality cannot fully account for the dual changes in productivity and inequality.

Another potential explanation is that rising inequality could be harming growth. There is some macroeconomic evidence for this view as well as plausible microeconomic channels, like the impact of inequality on the ability to harness the talents of potential innovators across the income spectrum (Ostry, Berg, and Tsangarides 2014; Cingano 2014; Bell et al. 2017). In other work for the Peterson Institute for International Economics' Rethinking Macroeconomics project, one of us outlined some skepticism of a general empirical link between inequality and economic growth (Furman 2018). Most relevant for this paper, however, is that regardless of one's view on the existence and sign of such a link, any plausible magnitude for such an effect would fall well short of explaining the 1 to 1.5 percentage point drop in productivity growth.

A third possibility, the one explored in the remainder of this paper, is that the slowdown of productivity growth and the rise of inequality have a common cause, namely that reduced competition and reduced dynamism—in part caused by specific policy changes—have contributed to both issues.

The goal of the paper is not to advance a simple monocausal explanation, since clearly many factors, some common and some unrelated, have affected productivity growth and inequality. Instead it tries to explore whether this hypothesis is consistent with empirical observations. The question of whether the hypothesis explains a part, potentially even a key part

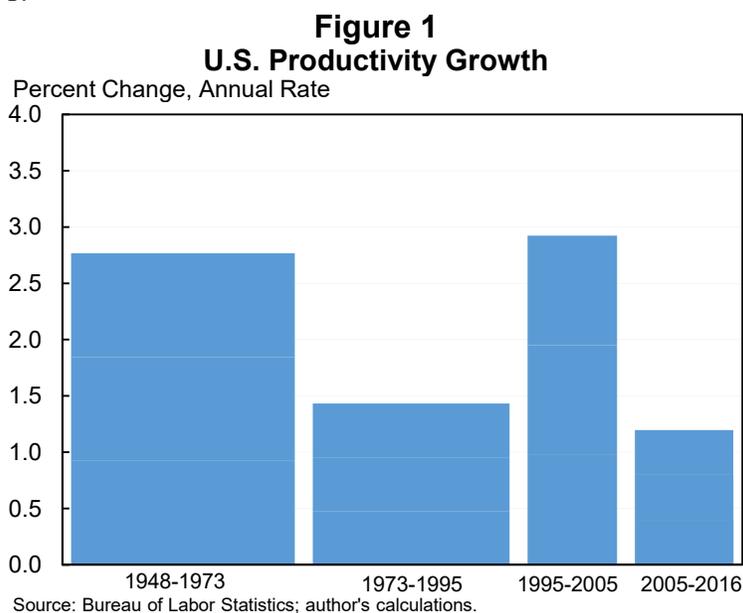
of both phenomenon, is important both for academics and others trying to explain these issues, but also for policymakers because it opens up the opportunity for a whole new set of policies. Such new policies, in areas like product markets and labor markets, have the potential to yield benefits for both productivity and inequality.

This paper builds on a paper we originally released in 2015 that speculated on some aspects of these links (forthcoming as Furman and Orszag 2018). That paper drew on new research finding that much of the growth of earnings inequality was between firms not within them (Barth et al. 2016 and Song et al. 2016). Since Furman and Orszag (2018) was initially released, further research has corroborated and advanced our broader thesis, including Gutiérrez and Philippon (2017 and 2018) linking the slowdown of investment at the industry level to reduced competition, Barkai (2016) finding evidence that reduced competition and higher markups was reducing the labor share of income, and Autor et al. (2017) linking increased concentration to larger declines in the labor share of income (although in this last case they view the increased concentration as the result of more competition not less).

This paper will first list some of the key stylized facts about the slowdown of productivity growth and the rise of inequality that we would want any explanation to address. Then it discusses reduced dynamism and reduced competition and the roles they could play in both phenomenon. Finally, it discusses some of the potential causes of this reduced dynamism and competition.

Stylized Facts on Productivity Growth and Inequality

The most important fact about productivity growth is that it slowed starting in 1973 and, after an upswing from 1995-2005, has been growing even more slowly than during the initial slowdown, as shown in Figure 1.



Importantly for the explanation advanced by this paper, the productivity slowdown has not been universal. Some firms are doing very well—in fact increasingly well as compared to other firms. Rates of return on equity across the S&P 500 have become increasingly skewed with more firms earning very high returns as shown in Figure 2. Measures of the return on capital have also

become much more skewed. This is particularly evident when excluding goodwill from the definition of capital but even holds when goodwill is included as shown in Figures 3a and 3b.¹ Understanding the growth of the magnitude of rents in the economy lies somewhere between these two measures since at least some of what is considered a rent gets counted as goodwill, making the return to that type of capital seem more normal than it really is.

Figure 2
Distribution of Annual Returns on Equity Across S&P 500

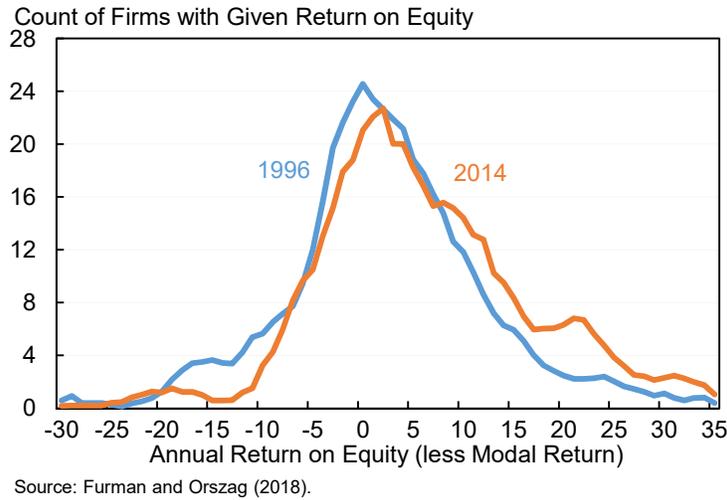


Figure 3a
Return on Invested Capital Excluding Goodwill, U.S. Publicly-Traded Nonfinancial Firms

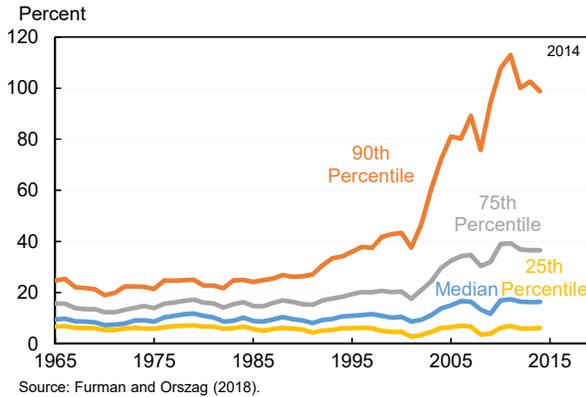
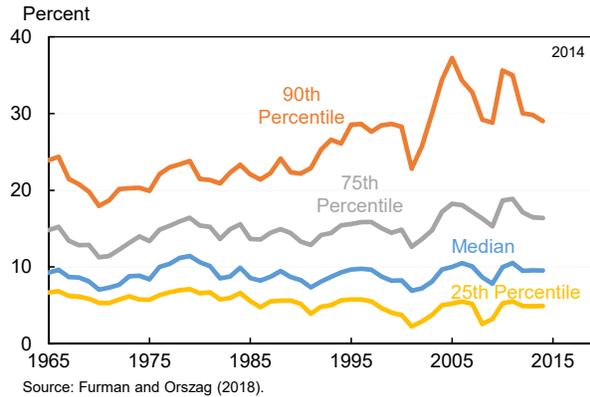


Figure 3b
Return on Invested Capital Including Goodwill, U.S. Publicly-Traded Nonfinancial Firms



The Organisation for Economic Co-operation and Development (OECD) also has a related finding that frontier firms have continued to make rapid progress in productivity while laggard firms have not—an indication that productivity growth at the frontier remains strong but is not being diffused throughout the economy (Andrews, Criscuolo, and Gal 2015). The OECD

¹ In this context, goodwill refers to a balance sheet item of companies that have been taken part in mergers or acquisitions, namely, the excess of purchase price over the book value of a company. For the purposes of computing return on invested capital, this may or may not be considered part of the definition of a company's capital.

study is limited by the fact that it only goes back to 2001 so does not answer the question of how typical or atypical this disconnect is, nevertheless its findings are part of a consistent story.

The most important fact about inequality is that it has increased. But again, for the purpose of this paper there are several important subfacts. The first is that the increase in inequality is largely *within* labor income, although a reduction in the share of income going to labor and an increase in inequality within capital income have also played a role. Specifically, Table 1 decomposes the fraction of the increase in different forms of inequality that are due to increased dispersion of labor earnings (e.g., managers being paid more than line workers), increasing dispersion of capital income (e.g., some getting more of the dividends relative to others), and a reduction in the labor share (corresponding to an increase in the capital share, which is more unequally distributed). Further up the income scale the relative importance of increased inequality within capital income grows and increased inequality within labor income falls but the change in the labor share remains a relatively less important factor.

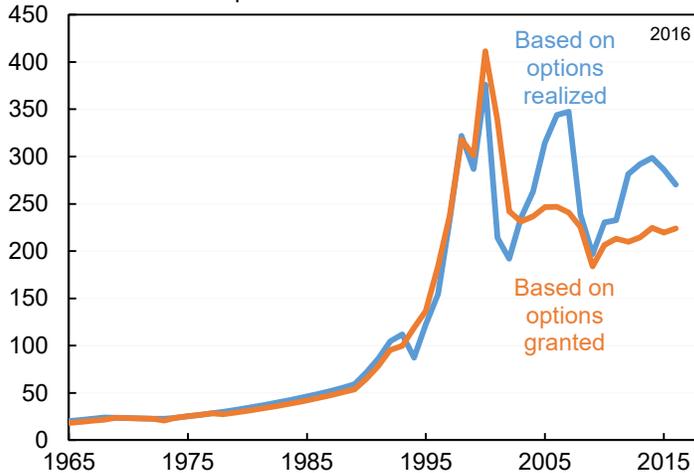
Table 1
Decomposition of Increases in Shares of Total Income, 1979-2013

	Top 10%	Top 1%	Top 0.1%
Share of Total Income			
1979	35%	11%	4%
2013	47%	20%	9%
Change	12 p.p.	9 p.p.	6 p.p.
Percent of Change in Total Income Due to:			
Increased Inequality in Labor Income	76%	47%	38%
Increased Inequality in Capital Income	8%	39%	50%
Change in Overall Labor/Capital Shares	16%	14%	12%

Note: Changes in the share of total income accruing to each portion of the distribution are decomposed using a shift-share analysis, with equal weights for each time period (such that there are no interaction effects between changes in the labor/capital share of overall income and each group's share of overall labor/capital income). Income shares are centered three-year averages. Source: Piketty, Saez, and Zucman (2017); author's calculations.

Within labor income, the rise in inequality is largely between the average workers at different firms or establishments rather than between workers within firms, according to research by Barth et al. (2016) and Song et al. (2016). For example, we have not seen CEO pay rise relative to median worker pay in the past twenty years, as shown in Figure 4. Instead, all of the workers at successful companies like Google and Goldman Sachs are being paid more relative to all the workers at less successful companies. As a result, a decomposition of the rise of earnings inequality finds that most of on the growth in inequality is across firms and not within firms.

Figure 4
CEO-to-Worker Compensation Ratio, 1965-2016
 CEO-to-Worker Compensation Ratio



Source: Mishel and Schieder (2017).

In part, the variations across firms seem to be the result of sorting—for example, businesses contracting out janitorial services into a new, lower-paid janitorial services firm. But there is also long-standing labor economics research on inter-industry wage differentials that finds that companies that are more successful will tend to share some of that success with their workers—that is that janitors are paid more by successful firms than by unsuccessful ones (Krueger and Summers 1988; Abowd et al. 2012). Even though this version of rent sharing has weakened somewhat over time, it continues to play a role (Krueger 2013).

Another possibility is that firm boundaries, such as through outsourcing, are evolving in ways that affect the decomposition of between- and within-firm components. Bloom et al (2018) find that large-firm wage premiums are declining (that is the premium paid to a similar worker at a large firm compared to a small one), and speculate that a key reason may be outsourcing. We are skeptical, however, that this phenomenon is large enough to explain why the bulk of the rise in wage inequality is between firms.

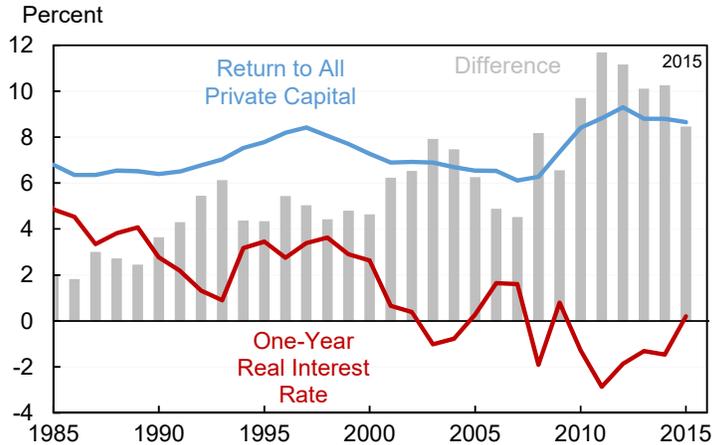
In sum, the persistence of large dispersions in rates of return and also inter-industry wage differentials would be puzzling in a world with perfect competition and free mobility of labor. The next section, however, documents the ways in which the real world is falling increasingly short of these ideals.

Increases in Concentration and Reductions in Dynamism

The evidence for reductions in competitive market pressures are mounting. First is the macroeconomic observation that while the rate of return on safe assets has fallen, the rate of return on overall capital has held steady or even risen somewhat, as shown in Figure 5. As a result, the premium on capital over safe assets has risen from around 200 basis points to over 800 basis points. Theoretically, this could reflect the fact that capital is riskier than before, “safe” assets are safer than before, or that rents have risen. At a macroeconomic level the third hypothesis is most consistent with the fact that while prices (i.e., the premium on capital) have risen, quantities (i.e., the rate of investment) have fallen. (The exact relationship between competition and investment depends on the specifics, but in a standard neoclassical model firms

facing less competition will raise their markups, reduce output, and reduce factor inputs of both labor and capital.)

Figure 5
Return to Capital vs. Safe Rate of Return, 1985-2015



Note: The rate of return to all private capital was calculated by dividing private capital income in current dollars by the private capital stock in current dollars. Private capital income is defined as the sum of 1) corporate profits ex. federal government tax receipts on corporate income, 2) net interest and miscellaneous payments, 3) rental income of all persons, 4) business current transfer payments, 5) current surpluses of government enterprises, 6) property and severance taxes, and 7) the capital share of proprietors' income, where the capital share was assumed to match the capital share of aggregate income. The private capital stock is defined as the sum of 1) the net stock of produced private assets for all private enterprises, 2) the value of total private land inferred from the Financial Accounts of the United States, and 3) the value of U.S. capital deployed abroad less foreign capital deployed in the United States. The return to nonfinancial corporate capital is that reported by the Bureau of Economic Analysis. Source: Bureau of Economic Analysis; Federal Reserve Board of Governors; author's calculations.

The microeconomic evidence is consistent with this view. At a high level of aggregation, most industries have seen a few large players account for an increasing share of the market, as shown in Table 2 (for further discussion, see CEA 2016 and Grullon, Larkin, and Michaely 2016). This same pattern is also found in more disaggregated data. Autor et al. (2017) show a consistent increase in concentration in both sales and employment and find a negative relationship between concentration and the labor share at the industry level. Gutiérrez and Philippon (2017 and 2018) have shown that governance, including common ownership, and reduced competition can account for the majority of under-investment since the early 2000s and that most of the decline in investment comes from the leading firms in an industry. Moreover, the micro data matches the macroeconomic observation—with larger reductions in investment growth, including in R&D, in industries that have seen larger increases in concentration.

Table 2
Change in Market Concentration by Sector, 1997-2012

Industry	Revenue Earned by 50 Largest Firms, 2012 (Billions \$)	Revenue Share Earned by 50 Largest Firms, 2012	Percentage Point Change in Revenue Share Earned by 50 Largest Firms, 1997-2012
Transportation and Warehousing	307.9	42.1	11.4
Retail Trade	1,555.8	36.9	11.2
Finance and Insurance	1,762.7	48.5	9.9
Wholesale Trade	2,183.1	27.6	7.3
Real Estate Rental and Leasing	121.6	24.9	5.4
Utilities	367.7	69.1	4.6
Educational Services	12.1	22.7	4.2*
Professional, Scientific and Technical Services	278.2	18.8	2.8*
Arts, Entertainment and Recreation	39.5	19.6	2.5*
Administrative/ Support	159.2	23.7	1.6
Health Care and Assistance	350.2	17.2	0.8*
Accommodation and Food Services	149.8	21.2	0.1
Other Services, Non-Public Admin	46.7	10.9	-0.2*

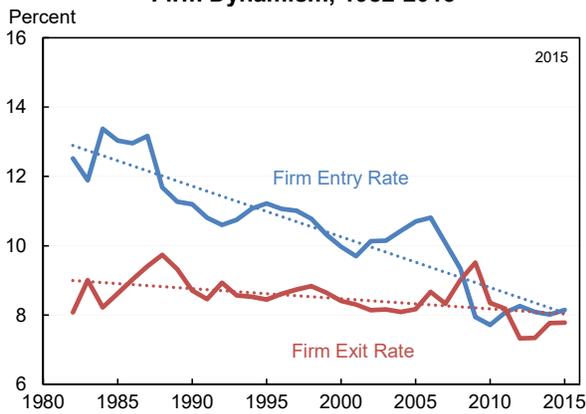
Source: Council of Economic Advisers (2016).

The statistical evidence is complemented by case studies in a wide range of industries that have found increased concentration in loan shares of major financial institutions (Corbae and D’Erasmus 2013), increased share of revenue in the top firms for eight out of nine agricultural industries (Shields 2010), a 50 percent increase in the average Herfindahl-Hirschman index in the hospital sector (Gaynor, Ho and Town 2015), as well as increases in concentration in wireless (FCC 2015) and railroads (Prater et al. 2012).

Moreover, these statistics may understate the degree of consolidation as they only measure the market shares of individual firms. Looking at the market shares of *owners* of firms there has been even more consolidation, as documented in a series of papers by Martin Schmalz and others (Anton et al. 2017; Azar, Raina, and Schmalz 2016; Azar, Schmalz, and Tecu Forthcoming). In particular, common ownership has grown as a small number of large asset managers increasingly own large stakes in all of the major players in an industry, potentially leading them to favor uncompetitive behavior.

At the same time, just about everywhere you look in the economy there is less dynamism, fluidity, and churn. As shown in Figures 6a and 6b, a one-third reduction in the rate of new business formation, together with a steady exit rate, means that, on average, firms are larger and older today while also representing an increased share of employment. Since the early 1980s, the share of firms that are less than five years old has fallen by about a third, while the share of employment accounted for by these firms has fallen by nearly half.

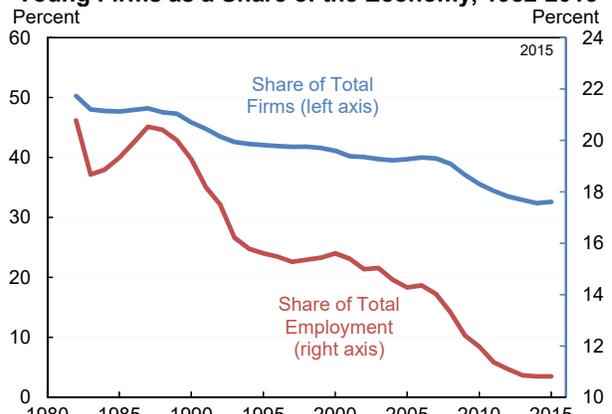
Figure 6a
Firm Dynamism, 1982-2015



Source: Census Bureau, Business Dynamics Statistics; author's calculations.

Figure 6b

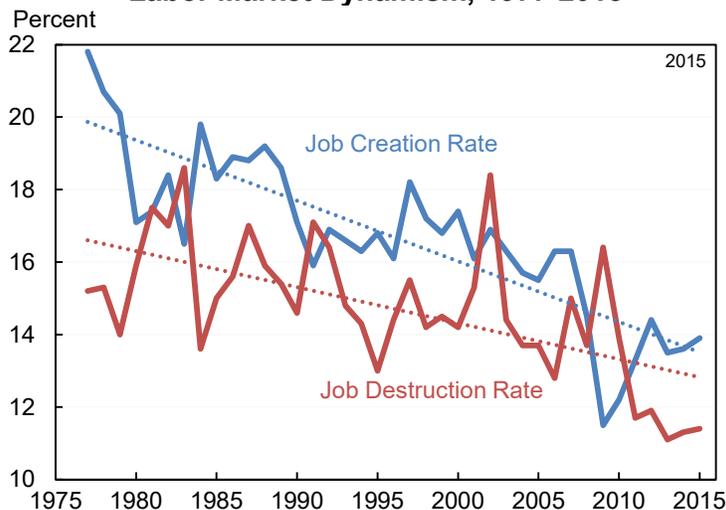
Young Firms as a Share of the Economy, 1982-2015



Source: Census Bureau, Business Dynamics Statistics; author's calculations.

Reduced fluidity has also been observed in just about every labor market series. From the perspective of employers, the rates of job creation and job destruction have fallen steadily as shown in Figure 7. Davis and Haltiwanger (2014), Decker et al. (2014), Decker et al (2018), and Hyatt and Spletzer (2013) find that the shift towards older firms is at least one factor related to the decline in labor market fluidity, though the changing age structure of firms appears to account for a small share of the drop. From the perspective of employees, the rates of shifting between different places, industries, occupations, or even just of employment-to-employment transitions have all steadily fallen. Across a range of measures, Molloy et al. (2016) find that labor market fluidity has been declining since at least the 1980s. On average, the decline has been about 10 to 15 percent, with nearly a 25 percent drop in employment-to-employment transitions. Over a longer time period, declines in geographic mobility have been even more dramatic. By 2013, the interstate migration rate was half as large as it was from 1948-1971, while intrastate migrations rates have fallen by around a third (Molloy, Smith, and Wozniak 2014).

Figure 7
Labor Market Dynamism, 1977-2015



Source: Census Bureau, Business Dynamics Statistics; author's calculations.

Why Has Concentration Risen While Dynamism Has Fallen?

In general there are two stories for explaining rising concentration and falling dynamism. The first is benign, that these factors reflect improvements in efficiency. Large firms may be the ones that drive the most effective improvements in efficiency. Telecommunications companies, for example, have increasing returns to scale that make it inefficient and hard for multiple wireless providers to coexist. Network externalities represent a genuine benefit—we are better off with a single social network where we can find all our friends instead of fragmenting into multiple different such networks. Increased price sensitivity on the part of consumers can lead to greater concentration in more efficient firms. And global competition may drive the consolidation of national capacity to meet the larger scale necessary to compete in the international market, although this last factor is only particularly relevant for the 13 percent of the U.S. economy that is exposed to trade. Reductions in fluidity may also have a benign explanation if matching technologies have gotten better so workers are able to more efficiently sort themselves into jobs.

All of these explanations have some merit, and in certain cases or sectors may have substantial merit. To the degree that concentration has risen for these reasons there may be a role for policy to address certain undesirable side-effects—natural monopolies, for example, may need various forms of regulated prices—in ways that are distinct from just increasing competition or reducing policy-erected barriers to entry.

One thing all of these explanations have in common, however, is that they are consistent with *increasing* productivity growth. This does indeed match the data in certain sectors like retail (Crouzet and Eberly 2018) or earlier time periods (Gutiérrez and Philippon 2017). But it does not match the economy-wide data recently. This motivates the search for other explanations.

One less benign explanation is a reduction in antitrust enforcement. The United States experienced a shift in prevailing attitudes towards antitrust from the early 1980s onward, with the growth of Chicago School views that competition is more extensive than previously thought, that the harms of consolidation are smaller than previously thought, and that remedies to promote more competition can bring greater costs than benefits (Posner 2009; Bork 1993; Easterbrook 1984). This intellectual development has affected both the enforcement agencies and also the courts. The result has been a near end to any actions on vertical mergers and a curtailment of actions on horizontal mergers. As Kwoka (2017) has shown, the Federal Trade Commission (FTC) has effectively stopped enforcement actions on mergers down to 5, 6 or 7 competitors and reduced enforcement actions on other mergers. More recently, parts of the anti-trust community have started to revisit whether the pendulum has shifted too far toward the Chicago view.

More evidence that this increase in concentration is not the “natural” result of efficiency, but instead reflects deliberate policy choices, comes from the fact that while concentration has risen in the United States, it has fallen in the Eurozone and some European Union members, like the United Kingdom (Döttling, Gutiérrez, and Philippon 2017). Döttling, Gutiérrez, and Philippon suggest that divergent paths in antitrust efforts, which have weakened in the United States and become stronger in Europe, may be one factor contributing to the observed trends in competition.

Other policy developments impacting this dynamic have been the increased importance of intellectual property protections, which create a legal form of monopoly, and those, such as the expansion of occupational licensing and land use restrictions, which hamper geographic mobility. The extent of occupational licensing has grown substantially, rising from 5 percent of the workforce in the 1950s to 25 percent of the workforce by 2008, with most of the rise not

being explained by the growth of previously licensed occupations like education and medicine (CEA et al. 2015). The expanded prevalence of licensing, combined with state-specific licensing requirements, creates a burden for licensed workers seeking to move across state lines. The growth of land use restrictions, by increasing the cost of housing, has also further curtailed mobility to higher wage areas (Furman 2015). Consistent with increased frictions such as these being a cause of both increased firm-level dispersion and lower productivity growth, Decker et al. (2018) highlight the role of adjustment frictions, as opposed to idiosyncratic firm-level productivity shocks, in driving both wider firm-level variance and a decline in productivity growth since 2000.

Summary and Policy Implications

Our analysis is that there is mounting evidence that an important common cause has contributed to both the slowdown in productivity growth and the increase in inequality. The ultimate cause is a reduction in competition and dynamism that has been documented by Decker et al (2014, 2018) and many others. This reduction is partly a “natural” reflection of trends like the increased importance of network externalities and partly a “manmade” reflection of policy choices, like increased regulatory barriers to entry.

These increased rigidities have contributed to the rise in concentration and increased dispersion of firm-level profitability. The result is less innovation, either through a straightforward channel of less investment or through broader factors such as firms not wanting to cannibalize on their own market shares (Arrow 1962).

At the same time, these channels have also contributed to rising inequality in a number of different ways. One is through a “rent sharing” channel as increasingly disparate firm-level success translates into increasingly disparate wages for the workers at these firms. A second mechanism is simply through increased leverage by employers that reduces wages and raises profits, in part because workers with fewer choices and less mobility may have less ability to bargain for wage increases.

This analysis has three policy conclusions. First, to the degree that concentration or reduced fluidity is the result of improvements in efficiency, there is no market failure and no need for product market policies. This situation should generally be associated with increased efficiency. Should the efficiency improvements also result in higher-than-desired levels of inequality, the appropriate remedy is in the tax-and-transfer system not in interfering with the functioning of markets themselves.

Second, to the degree that concentration or reduced fluidity is the result of policy, then the offending policies should be changed. That could entail more vigorous enforcement of antitrust policies, limits on the ever-expanding scope of intellectual property protections, and an effort to reduce regulations that create barriers to entry and mobility for both workers and firms, like occupational licensing and land use restrictions. Addressing these policy-induced market failures holds out the prospect of both increasing productivity growth and reducing inequality, bringing a wider range instruments to bear on these questions than has often been the case previously.

The third set of implications is the toughest and that is where both efficiency and policy contribute to increased concentration. In the case of the technology sector, for example, there are tremendous efficiencies from the innovation associated with leading companies and their scale. But the network effects also create tremendous barriers to entry in areas like online advertising,

search, and operating systems for mobile phones and computers. Traditional antitrust remedies would risk these efficiencies, but doing nothing risks a slowdown in innovation accompanied by increased inequality. At a minimum, encouraging greater competition through more individual ownership of data and encouragement of common standards could help set the right balance.

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