

# Has slower business dynamism been associated with slower productivity growth for US sectors?

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## Abstract

This is where I shall write the abstract.

## 1 Introduction

Business dynamism has long been regarded as a key driver of productivity growth. According to the theory of creative destruction, a dynamic economy fosters innovation by allowing more productive entrants to displace less efficient incumbents. Indicators such as the job reallocation rate, firm entry and exit rates, and resource reallocation are often cited as evidence of this churn, which theoretically drives aggregate productivity upward. However, over the past few decades, several common measures of business dynamism have steadily declined. As shown in Figure 1, the job reallocation rate – a summary statistic of the pace at which jobs shift across firms – fell from roughly 30% in 1992 to about 23% in 2020. This approximately 25% decline, suggests a meaningful slowdown in the rate at which workers are being reallocated across roles, potentially implying reduced productivity growth and innovation according to the theory.

Yet despite this marked decline in business dynamism, aggregate productivity growth has not followed a similarly downward trajectory. The five-year moving average of productivity growth in 1992 is remarkably similar to that in 2020. This divergence raises a central question: If creative destruction is slowing, why has productivity growth not slowed down as well? Are there alternative mechanisms at work that help sustain aggregate productivity growth despite falling dynamism?

To explore this question, I examine several key variables: the job reallocation rate, firm birth and death rates, total factor productivity (TFP) growth, firm markups, R&D spending, patent applications, and productivity dispersion. The job reallocation rate captures the rate at which jobs are created and destroyed across firms, and thus reflects how rapidly labour is moving toward more productive uses. The firm birth and death rates serve as direct but nuanced indicators of creative destruction. A high firm death rate, for instance, is only indicative of a healthy competitive environment when accompanied by a high birth rate. On their own, such figures can also signal downturns or sectoral stagnation. TFP growth provides a measure of output not explained by labour and capital inputs, and therefore is a good proxy for technological progress. Firm-level markups help track shifts in market power, while R&D spending and patent filings offer insight into the innovation strategies firms pursue to maintain or improve competitiveness.

This paper argues that although business dynamism has declined, productivity growth has remained resilient because of rising market concentration and the outsized influence of “superstar firms”. These firms, often leaders in their respective industries, have maintained high levels of productivity growth and driven investment in R&D, despite broader declines in entry rates and job reallocation.

At the same time, rising markups suggest growing market power, which is concentrated in these firms. As market share reallocates toward highly productive incumbents, aggregate productivity can rise even if the broader ecosystem of firms becomes less dynamic. This pattern is consistent with Schumpeterian growth models, which emphasise the role of innovation-driven competition and strategic R&D investment by market leaders.

Empirical research also supports this view, for example, Autor et al. (2020) find that industries experiencing rising concentration often display faster, not slower, productivity growth. De Loecker et al. (2020) show that average firm markups have increased dramatically since 1980, with market share shifting toward high-markup firms. Aghion et al. (2005) highlight an inverted-U relationship between competition and innovation, where moderate levels of competition foster innovation. Meanwhile, Andrews et al. (2016) document a growing gap between productivity growth at frontier firms and laggards. Griffith et al. (2023) tie these trends to the Schumpeterian tradition, illustrating how innovation is often concentrated among a few firms that use R&D to preserve their leadership.

In what follows, I investigate these trends using US sectoral data and firm-level indicators to better understand how productivity growth can persist in an era of declining business dynamism.

## 2 Data and Empirical Strategy

This paper combines a descriptive and econometric approach to examine the relationship between business dynamism, productivity growth, and market concentration in the United States over the past three decades. First, I document long-term trends in key indicators of business dynamism, including job reallocation rates, and firm entry and exit rates. I compare these to aggregate productivity growth patterns. The aim is to establish whether the decline in dynamism was accompanied by slower productivity growth.

To formally test this relationship at the sectoral level, I conduct a panel regression using sector-level data, including fixed effects to control for time-invariant differences across sectors, and controlling for sector size using their relative output share in the economy. The dependent variable is total factor productivity (TFP) growth, while key independent variables include the job reallocation rate and firm birth/death rates. This setup allows me to evaluate whether there is a statistically significant association between business dynamism and productivity growth. The equation I will estimate is as follows:

$$TFP_{st} = \alpha_{st} + \theta_1 fdr_{st} + \theta_2 fbr_{st} + \theta_3 jrr_{st} + \beta y_{st} + \beta_s + \gamma_t + \epsilon_{st}$$

where  $\theta_1, \theta_2, \theta_3$  are the coefficients of interest on the firm death rate, firm birth rate and job reallocation rate respectively.  $y_{st}$  represents the sector output share in the economy and  $\beta_s, \gamma_t$  are sector and time fixed effects respectively.

To further understand the underlying mechanisms, I estimate firm-level markups and productivity using methodologies outlined in Akerberg et al. (2015), and De Loecker et al. (2020). These estimates allow me to track trends in markup dispersion and productivity dispersion across firms, particularly focusing on the upper tails of the distribution (e.g., 95th, 80th percentiles). I also examine how R&D investment and patenting activity have evolved over time, assessing whether innovation has increased during this period.

The analysis draws on several key data sources: the US Business Dynamics Statistics (BDS) for firm entry, exit, and job flows; the Bureau of Labor Statistics (BLS) for sectoral TFP and output;

Compustat for firm-level financial data used in markup estimation; the US Patent and Trademark Office (USPTO) for patent data; and FRED for R&D spending.

The analytical framework is grounded in the Schumpeterian model of growth, which posits that firms with higher profits invest more in R&D, leading to faster productivity growth. This suggests that rising market concentration, by increasing profitability at the top, can sustain productivity growth even in an environment of declining dynamism, while also contributing to greater productivity dispersion.

### 3 Discussion

#### 3.1 Business Dynamism and Productivity Growth Patterns

Economic theory suggests a strong link between productivity growth and business dynamism. One key mechanism behind this is creative destruction, a process where less productive incumbent firms are replaced by newer, more innovative entrants. These new firms often introduce improved technologies or more efficient practices, thereby raising overall productivity. This implies that periods of high business dynamism should be associated with faster productivity growth.

However, this relationship is not guaranteed. It may also be the case that incumbent firms remain more productive than new entrants, especially if they continue to invest in innovation and efficiency improvements. In such cases, productivity growth might not depend on firm turnover. Furthermore, other factors could explain a decline in dynamism. Increased regulation may raise barriers to entry, reducing the flow of new firms into markets. Greater industry concentration and market power among incumbents could also stifle competition, for example, through predatory pricing or strategic acquisitions, without necessarily causing a fall in productivity.

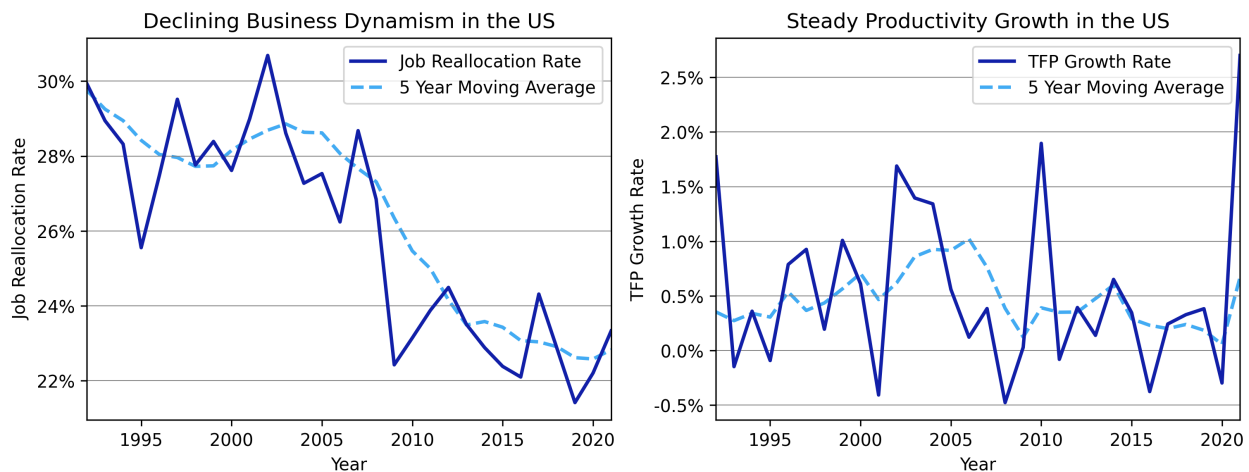


Figure 1: Creative destruction vs productivity growth.

Figure 1 helps illustrate these trends. The left panel shows the job reallocation rate alongside its five-year moving average. It reveals a clear decline in dynamism in the US over the past 30 years, with a particularly steep drop following the 2008 financial crisis. In contrast, the right panel shows total factor productivity (TFP) growth, which is more volatile. Its five-year moving average shows a slight upward trend in the early 2000s, followed by a decline after 2008. While the patterns of TFP growth and business dynamism might appear to have some alignment, it is not clear at this point

whether there is a relationship. To explore the relationship more, a panel regression can be used, controlling for both sector and time effects, along with (normalised) output.

Table 1: Panel regression results of TFP growth on business dynamism measures.

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
const	-0.0013	0.0147	-0.0898	0.9285	-0.0301	0.0275
firm_death_rate	0.3373	0.1603	2.1041	0.0358	0.0224	0.6521
firm_birth_rate	-0.0003	0.0005	-0.6212	0.5347	-0.0012	0.0006
job_reallocation_rate	-0.0772	0.0449	-1.7202	0.0860	-0.1655	0.0110
output	0.0027	0.0043	0.6416	0.5214	-0.0057	0.0112

Table 1 presents the results of such a regression, using firm birth rates, firm death rates, and the job reallocation rate as proxies for business dynamism. The findings suggest no strong or consistent relationship between these measures and TFP growth. The only statistically significant result is the firm death rate, which appears positively associated with productivity growth. However, interpreting this result is challenging. As noted earlier, a rising death rate alone does not necessarily reflect increased dynamism, especially if it is not accompanied by a corresponding rise in the birth rate. Since the birth rate is not significantly correlated with productivity growth in this model nor clearly different from 0, the significance of the death rate may reflect other dynamics, such as unproductive firms exiting during recessions, rather than the healthy process of creative destruction.

Even when firm birth and death rates are excluded and the regression focuses solely on the job reallocation rate, the relationship with TFP growth remains statistically insignificant. In other words, across a range of specifications, there is little evidence to support a robust link between business dynamism and productivity growth in the data.

This raises an important question: if business dynamism has declined, why hasn't productivity growth shown a consistent downward trend? One possibility is that productivity gains in recent decades have come increasingly from within firms, particularly large incumbents that have invested heavily in technology, automation, and process improvements. This shift would weaken the traditional assumption of a link between business dynamism and productivity growth.

### 3.2 Market Concentration, Markups and R&D

A similar pattern that has emerged over the last 30 years in the US has been a strong increase in the market concentration and the markup charged by firms. For example, De Loecker et al. (2020) find that average markups in the US increased from 18% in 1980 to 67% in 2017 implying a significant increase in the pricing and market power of incumbent firms over that period.

Using the methods for productivity and markup estimation outlined in Akerberg et al. (2015), and De Loecker et al. (2020), this paper examines markup trends from the early 1990s to 2021. The results support the broader findings that markups have been rising steadily across the distribution, with especially sharp increases among the most dominant firms. As Figure 2 illustrates, firms in the 95th percentile of the markup distribution saw their markups grow from approximately 2.5 times marginal cost in 1992 to over 4.5 times by 2021. This significant dispersion suggests that a small number of high-markup firms are pulling away from the rest, possibly reinforcing their market dominance.

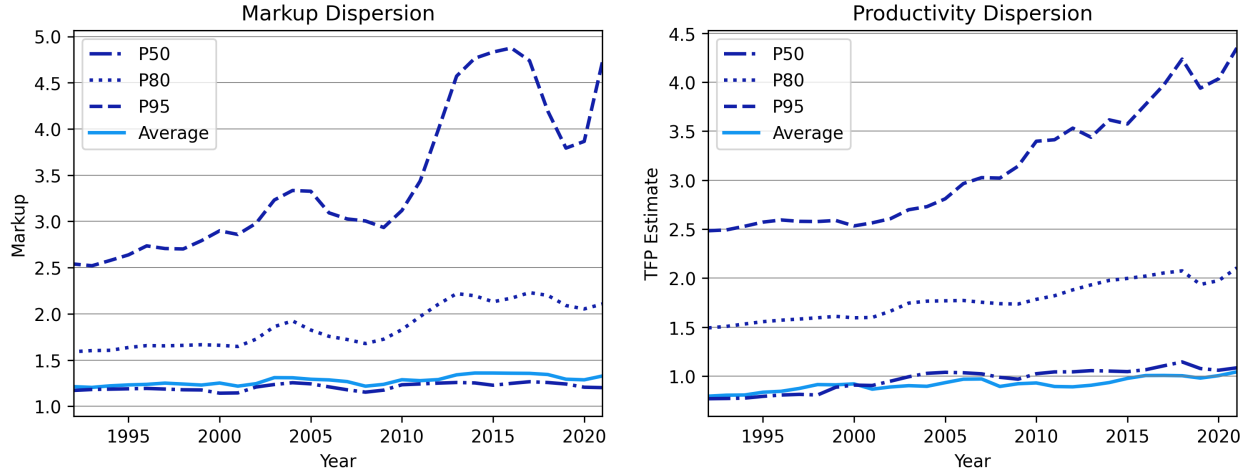


Figure 2: Increasing productivity and markup dispersion.

Rising markups translate into higher firm profitability, which, according to Schumpeterian growth theory Aghion & Howitt (1992), plays a key role in driving innovation. Profitable firms have a greater financial capacity to invest in R&D and also a stronger incentive to do so, as innovation helps them maintain or extend their lead in concentrated markets. Leading firms may therefore reinvest their profits to defend their competitive position and create higher barriers to entry.

This theoretical link is reflected in the empirical data. Figure 3 shows consistent year-on-year increases in real R&D spending in the US, alongside a rising number of US originated patents being filed. While causality is complex, the co-movement of rising markups, market concentration, and innovation inputs suggests that the accumulation of market power may be enabling, rather than stifling, innovation – at least among incumbent firms.

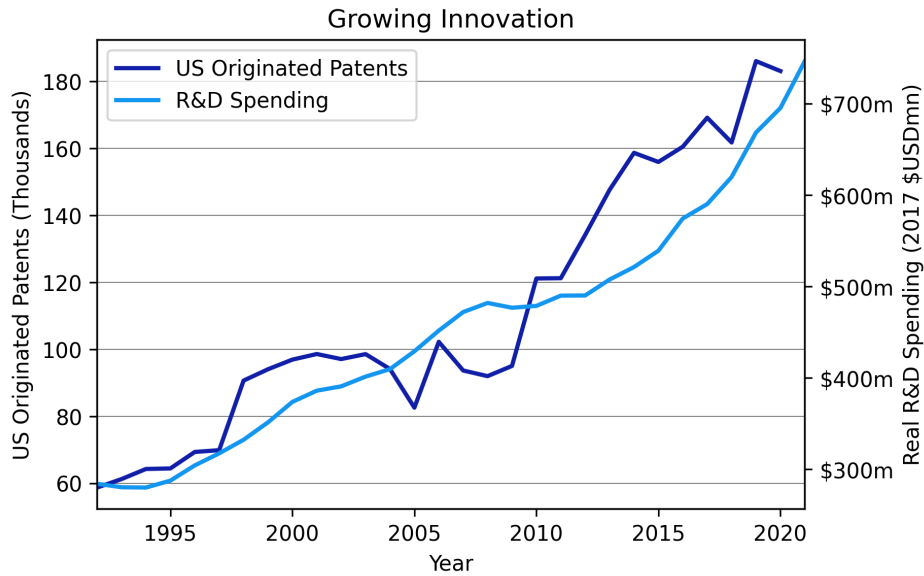


Figure 3: Growing real R&D spending and patent filings.

### 3.3 Productivity Dispersion

Alongside the rise in markups, Figure 2 also reveals a marked increase in productivity dispersion over the same period. This trend is especially pronounced at the top of the distribution. Firms in the 95th percentile of markups increased their markups by just over 80% between 1992 and 2021, while firms in the 95th percentile of productivity saw their productivity rise by just under 80%. A similar pattern appears at the 80th percentile, where both metrics grew by just over a third.

While we cannot definitively establish a causal link, the similarity is nonetheless striking. It suggests that rising market power and profitability may be enabling some firms to sustain strong productivity growth, potentially through reinvestment in technology and innovation.

This widening gap between the most productive and least productive firms is well-documented in recent literature. Studies on “superstar firms” have noted how a small number of dominant players are increasingly responsible for aggregate productivity growth and innovation (Autor et al., 2020). These firms are able to pull ahead due to economies of scale, access to capital, and large R&D budgets, leaving smaller competitors further behind. The result is a growing dispersion not just in market outcomes but in fundamental productivity as well.

### 3.4 A New Kind of Creative Destruction?

Traditionally, creative destruction refers to the process whereby new, more productive firms displace inefficient incumbents, driving productivity growth. However, the patterns observed in this analysis suggest the emergence of a new form of creative destruction, driven not by external disruption, but by the internal reinvention of incumbent firms.

As dominant firms gain market share and pricing power, they do not merely defend their positions by erecting barriers to entry; they actively invest in innovation to preempt potential challengers. Through sustained R&D spending and technological adoption, they continuously “destroy” their own previous models and practices to remain competitive. This self-disruption allows incumbents to retain leadership roles in increasingly concentrated markets.

Rather than through firms continuously entering and exiting, today’s productivity frontier is shaped by firms that transform themselves faster than others can catch up. This model of innovation-driven consolidation may explain how productivity can rise even as traditional measures of business dynamism, such as firm entry and job reallocation, are declining.

## 4 Conclusion

This analysis set out to explore whether declining business dynamism in the United States has been associated with slower productivity growth. The answer, based on sector-level data from 1992 to 2021, appears to be no.

Measured through indicators such as job reallocation and firm entry rates, business dynamism has indeed declined in recent decades. However, total factor productivity (TFP) growth has remained relatively stable over the same period, with no clear downward trend. At the same time, the data reveals sharp increases in market concentration and firm markups, particularly among firms at the top of the distribution. These high-markup firms have also seen the strongest increases in productivity. In line with the Schumpeterian growth theory, rising profitability appears to be fuelling increased investment in research and development, as seen through sustained growth in real R&D spending and patenting activity.

Together, these trends have contributed to widening productivity dispersion. The top-performing firms are pulling further ahead, not because of increased competition from entrants, but because they are innovating from within and leveraging their market power to continuously improve and adapt. This dynamic points to a new kind of creative destruction, one in which incumbents disrupt themselves in order to maintain their dominance.

Nevertheless, several limitations must be acknowledged. The markup and productivity analysis relies on Compustat data, which covers only publicly listed firms, potentially omitting important dynamics in private or smaller enterprises. Moreover, heterogeneity across sectors may obscure more nuanced trends. Finally, while the relationships observed are interesting, establishing causality remains a significant challenge.

Overall though, the findings suggest that the mechanisms behind productivity growth may be shifting. As entry rates fall and competition diminishes, innovation increasingly appears to be driven by incumbent firms reinventing themselves. Whether this model of self-disruptive innovation can be sustained, and whether it benefits the broader economy, remains to be seen.

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