Commentary on **Slowing Business Dynamism and Productivity Growth in the United States**

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Comments given at the *2020 Jackson Hole Conference* on the paper Slowing Business Dynamism and Productivity Growth in the United States by Ufuk Akcigit and Sina T. Ates.

The title of this session is why has the trend rate of growth declined. The authors offer their answer in the title: "Slowing Business Dynamism".

The starting point of the analysis is a striking empirical pattern, which has been studied by a number of authors. Several recent studies document a remarkable increase in firms market power in the United States over the past four decades. This is to my mind one of the more interesting and important empirical finding about the US macroeconomy in the last few years. The literature has documented this development in a variety of ways, and the paper surveys some of this evidence. One way is to look at the revenue shares of firms in each sector. Author et al (2017), for example, document that the concentration of sales among the top 4 percent manufacturing firms went from 38 to 43 percent from 1982 to 2012, and show a similar pattern across a number of other sectors. Other authors document how measures of firm concentration, such as the Herfindahl-Hirchman index, have increased (see e.g. Guiterres and Phillipon (2017)). Another common measure, which is the focus of a growing literature, is to measure *markups*, that is, the price charged for a product in excess of its marginal production cost. The markup is a simple measure of firms market power. According to most accounts, markups have increased substantially over the past few decades, although individual measures vary. One the upper end, De Locker and Eechout estimate that markups have increased from 18 percent in 1980 to 67 percent in 2015 while on the lower end Hall (2018) estimates that markups have increased from 12 to 27 percent. Another strategy, see e.g. Barkai (2020), is to look at the profit share, that is the part of national GDP, which is not paid to labor or capital, but instead often attributed to "pure profit" or sometimes dubbed "factorless income" (Karabarbounis and Neiman (2019)). This share has been rapidly increasing in recent decades, and in my own work (Eggertsson, Robbins and Wold (2020)) we estimate an increase from about 12 percent in 1970 to 22 percent in 2018.

While there are number of controversies related to each individual measure, I think it is fair to say that there is an emerging consensus in the economic literature that firms market power has increased significantly over the past 40 years. Why is this so, what is driving it, and what are the implications?

One of the key points of this paper is to explain this development by a slowdown in *knowledge diffusion* and *business dynamism*. The authors then link this slowdown to the decline in productivity and slower trend growth. The author's make this case in two steps, first theoretically, then empirically. Let me summarize each step below before offering some observations.

1. **The theoretical case**

The authors suggest that a slowdown in knowledge diffusion is driving both the rise in market power as well as the slowdown in productivity. What is knowledge diffusion? By knowledge diffusion the authors have in mind the ability of firms to catch up with the leaders in their

industry. Consider for example the production of cellphones, where Apple is arguably the dominant force. In the model the authors propose, knowledge diffusion is modeled as the probability a firm in the cell phone industry can catch up to the leader in that industry. If this probability declines – for whatever reason -- then the Apples of the world will take a larger share of the market and thus increase their market power.

What about innovation and growth? If the ability of competitors to catch up to the industry leader goes down – other things constant -- this gives the leading firm, the Apples of the world, less and less incentive to innovate. Why? They are now facing smaller competitive pressures from their competitors that are now lagging further behind on average. Moreover, the followers also have a smaller incentive to innovate. The follower is discouraged by the superior technology of the industry leader because the odds of any innovation pushing it to the frontier is now lower. The result of a slowdown in knowledge diffusion is thus to increase the market power of industry leader *and* lower investment in technological innovation by both industry leaders and their followers. This, in turn, feeds into lower trend growth.

The empirical case

The authors buttress their case by data on patents. They establish several interesting and highly suggestive correlations. An important development they document is that patents seems to be increasingly concentrating in the hands of the top 1 percent largest firms. The stylized facts are quite striking when you look at data on patents reassignments which record the buying and selling of patents over time. While the top 1 percent of firms were responsible for the purchases of about 35 percent of patents in 1980, this number is now about 55 percent. Thus, big firms are increasingly responsible for new patent purchases. It is striking that this increase goes hand-in-hand with the rise of market power.

Perhaps even more striking, is that if a firm is accumulating patents this seems to be statistically correlated with *litigation between the patent acquiring firms and their competitors*. Thus, one interpretation is that patent acquiring firms are not necessarily trying to improve consumers experience. Instead, their goal is to use patents to establish a dominant position in a market by squeezing out their competitors -- which in-turn allows the them to charge higher markups.

Another piece of evidence consistent with this interpretation is the *nature* of the patents that are being filed over time. The authors document that to an increasing extent, patents are not geared towards big transformative ideas – how we typically imagine new patents -- that can genuinely change the landscape of an industry. Instead, over time patents seem to correspond small and iterative innovation, more geared towards carving out a dominant position in a market and preventing competitors from adapting the core technology of leading firms. The authors dub this as building “thicket” around its core technology to prevent adaption by competitors. The image this produces is of a firm more interested in innovative ways of forcing their competitors out of business rather than creating better customer experience.

I have a personal favorite, however, in the fascinating picture the authors sketch out. The authors provide evidence about the productivity of inventors. It appears that the number of inventors is decreasing in new firms over time. What seems to be happening is that mature firms are hiring the inventors away from young dynamic firms. Even more striking, however, is that once the inventors is bought by the larger firms, which are leading the industries and charging the highest markups, the actually "stop inventing" -- that is -- there is a statistically

significant decrease in the inventors productivity when they move to the mature firms. This happens even as the inventors income is increasing! What emerges from this account, is that over time firms are getting larger and larger, but at the same time less innovative and dynamic, and ultimately more prone to prop up prices of products in excess of their marginal costs. The result is a slowdown in business dynamisms and growth.

Shifting back the question

Overall, I view one of the key contributions of this paper as providing one plausible story for the mechanism through which some leading firms have increased their market power. The data the authors provide offer a rather compelling piece of evidence that patent accumulation, and their application in stifling competition, may have played an important role in the process. Moreover, it seems quite plausible, that via this mechanism, a slowdown in diffusion contributed to slower productivity growth.

Yet, the question of this session is why the trend rate of growth of has declined. If one accepts the answer the authors offer, this leaves me with a slightly reformulated question: Why has the transmission of knowledge slowed down from 1980 onwards? After all, the authors do not explicitly address why, exactly, the knowledge diffusion started to slow down some 40 years back.

Is there a unified explanation?

In searching for possible candidates for an explanation to this slightly reformulated question, I think it is helpful to recognize that, aside from a rise in monopoly power, there is also a series of other patterns in the data over this time period that seem to challenge the perspective one may take from the standard neoclassical model, the basic organizing framework of most economists over the last half a century. This is a theme I developed with Ella Wold and Jacob Robbins recently (Eggertsson, Wold, Robbins (2018)). I think this is useful, for it helps us to narrow down the kind of candidates that are plausible for a unified explanation.

Let me briefly summarize the “five puzzles” we identify in that paper, where we follow the grand tradition of macroeconomics of calling something a puzzle if it contradicts the standard neoclassical framework:

i) Since the mid or late 1970's the wealth to output ratio has increased in the United States, without any change in capital to output – according to the neoclassical model, they should be equivalent.

ii) A gradual increase in Tobin’s Q away from 1 – in the neoclassical model, Q is 1 in the long run.

iii) Average returns of capital have remained roughly constant, while the marginal return has declined -- the two should be the same in the neoclassical model.

iv) Labor and capital shares have declined simultaneously -- the sum of the two should be constant in the neoclassical model.

v) A modest decrease in the investment to output ratio, despite increasing Tobin’s Q and historical low interest rate -- the neoclassical model predicts an investment boom.

In our work, we highlight that a gradual increase in market power as well as a fall in interest rates can rationalize these five "puzzles". I do not want to revisit *why* these two forces are

helpful to reconcile the five puzzles. Instead, I want to point out a certain pattern we found which also may have important implications for the current paper. While we also focus the observation that market power appears to be increasing from about mid 1970's to the present, we also emphasize that there is evidence that market power follows a "U" shape. That is, if one goes back to 1960, there is evidence for that market power was higher at that point --declined into the mid 1970's where it bottomed out -- and has been rising ever since. Real interest rates also appear to follow this pattern. Moreover, the “five puzzles” summarized above also seem to follow a u-shape or an inverted u-shape of similar form, even if the evidence is somewhat uneven.

All this is to say, that if one wants to argue that it was a slowdown in knowledge diffusion that led to the increase in market power from the mid 1970's onwards, the question is, does that seem like a plausible explanation for the pattern prior to that period? Was knowledge diffusion low around 1960 then increased until mid 1970's and declining ever since? Of course, there is nothing that says that one needs a single explanation for these patterns. But the basic Occam razor principle would suggest that one explanation to rule them all would indeed be ideal.

To be clear, I will not be offering a unified explanation here. Yet, since I have the role of discussant, however, I will use that freedom to offer a speculative suggestion. To recap: we are looking for some kind of primitive force (ideally exogenous and not dependent on policy) that can explain a U-shaped pattern for market power as well as interest rates from the 1960s to the present day.

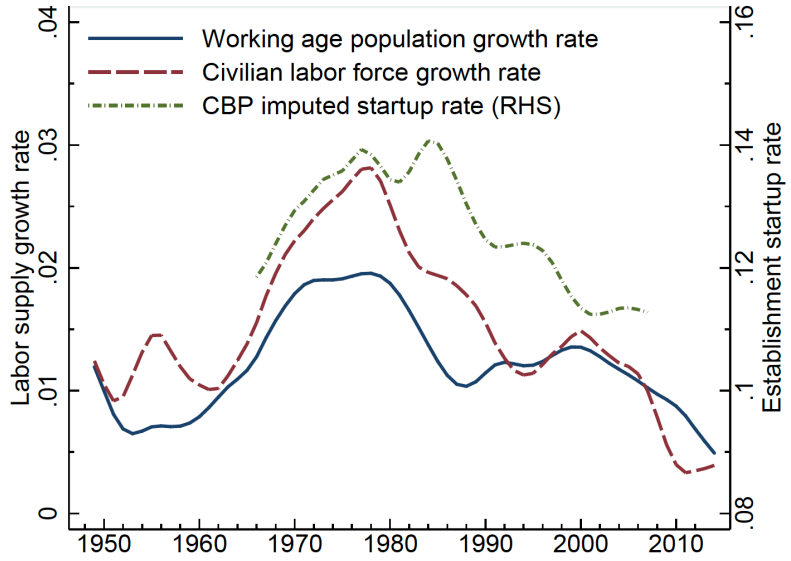

Figure 1: Growth rate of the labor force

Is there a role of demographics?

In some of my recent work (see e.g. Eggertsson, Mehrotra and Robbins (2019)) we found demographics to be useful in explaining the dynamics of interest rates over the past half a century. Could this be a unifying theme? Figure 1 is taken from Pugsley, Karahan and Sahin (2018). It shows the growth rate of the the labor force. The sold line shows the growth rate of the working age population, while the dashed line shows the growth rate of the civilian labor

force. This measure takes into account that there was a one-time increase in female labor force participation in the 1960's and 1970's. As the figure reveals this measure shows precisely the type of hump shape (inverted U) that could potentially rationalize the trends under question, i.e. the U-shaped form of markups and interest rates, and accordingly resolve the five puzzles discussed.

To be clear, this does not necessarily contradict the proposition that since 1980 there has been a slowdown in knowledge diffusion. Instead, it could give one explanation for *why* knowledge diffusion has been declining. In order to do so, of course, one would need a theory which links the slowdown in the growth rate of labor supply in the US labor market to the slowdown in knowledge diffusion.

It is not difficult to think of such a mechanism. One example: the growth rate of the labor supply is closely tied to young people entering the labor market. To the extent that young workers are more easily able to adapt new technology, this may then capture the exogenous parameter in the authors model which captures the probability that a follower firm catches up to the industry leader. More broadly, demographics could link to variations in market power, and/or trend growth, in a number of different ways. Consider first the demand side. As people age, their appetite for new products declines as they get more fixed in their habits (Borstein (2018) is a recent paper that explores this idea). Thus, as the population ages, we may see smaller and smaller incentives for innovation in new projects. It is not difficult to see how this could potentially manifest itself in increasing markups, slower business dynamism, and ultimately lower trend growth. Consider next the supply side. It is not difficult to see how aging may affect innovation and learning. At the most mundane level, people's incentive to learn are larger, the longer is the horizon they expect to live, providing a direct channel through which knowledge diffusion may be affected by the age composition of the work force. There is of course also evidence that younger people – in general -- find it easier to learn than older people. As the saying goes, you can't teach an old dog new tricks. But one could think of various more subtle mechanisms.[1]

Conclusions

It was not long ago that demographers and economist worried about a looming problem of ever-expanding population on Earth, implying a not too distant environmental disaster and/or exhaustion of finite resources. Indeed, this has been a long running theme in economics, which earned it the title "the dismal science". More recently, however, both demographers and economist have started to recognize that in not so distant future, the world population is predicted to contract rather increase. Indeed, this is already happening in several leading industrial countries as summarized in Jones (2020). In popular culture we see this in recent book titles like "Empty Planet". The paper cited by Jones (2020) is in fact titled "The End of Economic Growth?". The basic idea in Jones account is that because most innovations are non-rival goods -- all people benefitted from Newtons invention of the calculus -- and because innovations are arguably related to the number of innovators, which again are a function of the overall population, then a shrinking population could lead to the end of growth as we know it.

[1] Engbom (2017) is an example of a recent paper that explores the consequences on aggregate supply of aging.

All this is to say, that I think changing demographics will be high on the agenda in coming years, and will be likely to feature into most economic discussion, including the one under study here. The title of this session is "Why has the trend rate of growth declined?" and the excellent paper by Ufuc Akcigit and Sina Ates ties that development directly to the slowing business dynamism and what they identify as the slowdown of knowledge diffusion. I think their account has many strengths. In my mind, however, it raises the deeper question of what has been driving the slowdown in knowledge diffusion in the first place. If the slowdown in trend growth turns out to be permanent, and if the slowdown in knowledge diffusion emerges as the main culprit, I suspect that will be the question we next should address. My guess is that the demographic transition might play an important role in getting to the bottom of this question.

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