Reply to John Haltiwanger's Remarks on "The Reallocation Myth"

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1. Adjustment costs

We agree that market and regulatory frictions are distortions that can generate TFPR dispersion, reduce allocative efficiency, and lower the level of aggregate productivity. If such frictions get worse, they can subtract from growth.

Technological adjustment costs also lower the level of aggregate productivity (for a given distribution of TFPQ), but of course do not have obvious policy implications.

Our indirect inference in section 4 is indeed subject to the criticism that adjustment costs may extend beyond 5 years. We can look into whether there is serial correlation in 5-year firm employment growth rates.

Growth is notably above-average for surviving firms < 5 years old in Figure 4B of Haltiwanger, Jarmin and Miranda (2013 REStat). That was one reason we set the threshold at 5 years for "entrants". We can check how much difference it makes to use a threshold of 10 years.

In Figure VIII of Hsieh and Klenow (2009), we report that TFPR does correlate positively with 5-year input growth, consistent with adjustment costs to TFPQ shocks even at this frequency.

We would define Amazon as a gazelle from 1999-2012 given its rapid growth then. Amazon has arguably done a lot of innovating since 1999 in its range of products and delivery. It seems that Apple, Google, Microsoft, GM, Intel and others have, similarly, done a lot innovating beyond their first 5 or even 10 years of existence. Does this mean they couldn't have done this if they had been older? I don't know.

All firms were entrants at one point, of course. Yet one could have (a) all growth coming from entrants (entrants do all the innovating, incumbents just imitate them until they are creatively destroyed) or, at the other extreme, (b) all growth coming from incumbents (incumbents do all innovating until an entrant imitates them out of business).

Our results are totally silent on the indirect contribution of entrants through their effects on incumbent innovation. Entrants could stimulate incumbents to innovate as in Aghion and Howitt's "escape from competition" models. But it could go the other way. Less competition from entrants could raise the return to innovation by incumbents (due to the lower hazard of being eclipsed, and more available research talent to incumbent firms).

2. Sectors

Manufacturing is where most of the R&D and (especially) patents are. By this metric there is little innovation by Wal-Mart and other firms outside manufacturing. Yet manufacturing contributes only about 10% of TFP growth since 1987 according to the BLS Multifactor Productivity data series.

Maybe manufacturing is a big source of knowledge spillovers. I would love to have hard evidence on how big they are, their sources by firm and industry, and their recipients by firm and industry. I wouldn't call downstream use of ICT a knowledge spillover if the effect was just on ICT capital used downstream.

Akcigit and Kerr (2016) and Acemoglu, Akcigit, Bloom and Kerr (2013) are about manufacturing, specifically those firms in manufacturing who do R&D and patent. These firms comprise less than 40% of manufacturing employment, according to your (Haltiwanger's) discussion of the paper at the NBER Summer Institute a few years ago. Haltiwanger stressed that all entrants innovate, whether they do R&D and patent or not.

We think our methodology with Daniel Garcia-Macia (our 2016 working paper on "How Destructive is Innovation?") should identify the job destruction from the Big Box revolution in retail as coming from creative destruction. Wal-Mart etc. expanded at the expense of many firms that exited and contracted. In my 2016 working paper on "Missing Growth from Creative Destruction" with Philippe Aghion, Antonin Bergeaud, Timo Boppart and Huiyu Li, we found that the market share of incumbents fell most (after 5 years) in sectors such as retail. Incumbent market shares did not fall much in manufacturing.

In joint work with Liran Einav, Jon Levin and others, I am working with the Visa credit/debit card data to shed light on creative destruction in retail. In preliminary results, we are finding lots of local crowd out of brick & mortar stores due to online spending by locals (not shocking).

3. Olley-Pakes and overhead costs

The Olley-Pakes (OP) covariance term is problematic too, from the perspective of the models in my 2009 and 2014 papers with Hsieh and in our 2016 working paper with Garcia-Macia. We added a little to our Jackson Hole draft on this.

If the OP covariance term is problematic, then so is its within-firm term. In Decker, Haltiwanger, Jarmin and Miranda (2017 working paper on "Declining Dynamism, Allocative Efficiency, and the Productivity Slowdown"), there is quite a contrast in Figure 2 between the unweighted average within-firm productivity growth using OP (-3% per year) and the weighted average of within-firm productivity growth using FHK (+1.5% to +4% per year). If the latter is more accurate, then the covariance term in OP must not be capturing allocative efficiency appropriately.

In Bartelsman, Haltiwanger and Scarpetta (2013 AER), common overhead costs help generate the positive covariance term. Common-to-all-firms overhead costs cannot be very big, however, because the smallest firm is small in most industries. Moreover, if overhead costs were the primary source of variation in TFPR, one would expect a strong positive relationship between TFPR and size that is not in the U.S. data -- at least according to Figure VI in my 2009 paper with Chang. We also report that little of the TFPR dispersion is accounted for by age and size. Note that we use wages in the denominator of our TFPR = Revenue/Inputs. One reason others may find TFPR increasing with size is the size wage premium, which we effectively net out in our efficiency units interpretation.

Idiosyncratic overhead costs could account for a lot of the dispersion in TFPR. As stressed in Haltiwanger, Kulick and Syverson (2016), this dispersion need not represent distortions. My recent working paper with Mark Bils and Cian Ruane ("Misallocation of Mismeasurement?) is consistent with this. We present evidence that first differences (the change in revenue over change in inputs, which should difference out plant-specific overhead costs) do not project strongly on levels of TFPR. This could be due to measurement error as in our title. But it could also be due to idiosyncratic overhead costs. We talk about this in the paper, but should emphasize it more.

Aside: I routinely use industry-specific cost shares (e.g. in my 2009 paper with Chang). My paper with Bils and Ruane allows industry production elasticities to differ across India and the U.S. We have tried allowing industry production elasticities to differ over time within the U.S. and India, and this has not mattered for the moments we examined.

4. TFPQ vs. TFPR (and TFPQ_HK vs. TFPQ_physical)

My paper with Chang in 2014 ("The Life Cycle of Plants in India and Mexico") does not find a strong relationship between TFPR and TFPQ_HK in U.S. manufacturing. We get an elasticity < 0.1.

TFPQ_HK is indeed indirect and relies on a demand elasticity. If we thought good demand elasticity estimates were available for the wide span of industries (and countries and time), we would gladly plug them in. [Revenue productivity is also an indirect measure of true TFPQ. For instance, if TFPR dispersion comes from price-cost markups, this may be increasing in TFPQ but is typically not proportional to TFPQ.]

I believe there is a vital distinction between TFPQ_HK and TFPQ_physical. I think of TFPQ_physical (deflating TFPR by the firm or plant's average unit price) as capturing process efficiency. My hope is that TFPQ_HK incorporates quality and variety, in addition to process efficiency. Think of a firm with many products (e.g. GM or Procter & Gamble) or producers of very high quality products (Apple, Intel, Toyota). My impression is that these firms are not big primarily because their production costs are low (high TFPQ_physical), but rather because they have a lot of varieties and/or high quality ones (high TFPQ_HK).

For our Missing Growth paper we looked at the elasticity of average unit prices with respect to establishment revenue and found it to be basically zero. By this metric, we see no evidence that large establishments are large because of low unit prices, on average. This is only for the subset of manufacturing with quantities. It is for establishments not firms. But it is fully consistent with Hottman, Redding and Weinstein's (2016 QJE) findings on consumer product manufacturers in the AC Nielsen data. Big firms are big, they find, primarily because of high residual demand (quality, customer base), secondarily because they produce a high number of products (UPC codes), and not at all because of low markups or low marginal cost.

This is not to say that process efficiency has no effect on the size of firms and plants. Wal-Mart could be an example of a high process efficiency firm. Wal-Mart's many store locations might be thought of as variety achieved because of low costs.

Given the conceptual distinction between TFPQ_physical and TFPQ_HK, it is not surprising that TFPQ_HK varies more than TFPQ_physical and that that they do not correlate strongly with each other. More surprising to me is the idea that TFPQ_HK correlates less with exit than does TFPQ_physical. Conditional on TFPR, TFPQ_HK should be *very* correlated with size. Foster, Haltiwanger and Syverson (2008) found that size was a strong negative predictor of exit conditional on TFPR and TFPQ_physical (leading to their follow-up paper on Learning About Demand). In the Annual Survey of Manufacturers from 1978-2007, my paper with Bils and Ruane found that exit has a bigger semi-elasticity with respect to TFPQ_HK (-0.03) than with respect to TFPR (-0.02). This was based on gross output, not value added. I have not run the horse race with TFPQ_physical for the subset of industries with quantities, but can look into that. This is for plants. I would think the importance of TFPQ_HK would be even greater for *firm* exit. Firms with many establishments will tend to have high TFPQ_HK and exhibit low exit rates.

Prices are not inversely related to TFPQ_physical in the environment of my 2009 paper with Chang. We did not assume or impose that TFPR was orthogonal to TFPQ_physical. If the elasticity of TFPR with respect to TFPQ_physical is 0.5, then the elasticity of price with respect to TFPQ_physical should be -0.5 in our model.

5. The knife-edge critique

My understanding is that a knife-edge is when a summary statistic moves discontinuously when a parameter changes infinitesimally. As I argued in my discussion of Haltiwanger, Kulick and Syverson (2016) last summer, I don't see this in my 2009 paper with Chang. Neither "tau" nor "A" nor misallocation would vary discontinuously as one introduced (say) an infinitesimal overhead cost or infinitesimally variable demand elasticities.

I am in favor of refining estimates of production functions and demand systems and market structure, and seeing what this does to the distortions and misallocation one would infer. I would categorize markup dispersion (facing a given buyer) as a type of distortion, even if such dispersion arises endogenously due to non-CES preferences or non-monopolistic competition. See Michael Peters' job market paper (updated in December 2016), or Edmond, Midrigan and Xu (2015).

6. Allocative efficiency

As mentioned above, we are skeptical that *improving* allocative efficiency has contributed positively to growth in recent decades. It could be that deteriorating allocative efficiency has been a drag on growth. This is entirely consistent with Decker, Haltiwanger, Jarmin and Miranda (2017 working paper "Changing Business Dynamism and Productivity: Shocks vs. Responsiveness").

If one uses the methodology from my papers with Chang in 2009/2014, the decline in allocative efficiency looks massive and predates the slowdown in aggregate productivity growth. It implies something like a 50% decline in aggregate manufacturing efficiency due to falling allocative efficiency if taken at face value (Bils, Klenow and Ruane, 2017). Even beyond manufacturing, revenue labor productivity dispersion has been rising since 1987 according to Barth, Bryson, Davis and Freeman (2016 JoLE). My paper with Bils and Ruane maintains that this reflects rising measurement error and/or rising dispersion of overhead costs, at least in the Annual Survey of Manufactures.