

Referee Report for Kehrig (2016)

“The Cyclical Nature of the Productivity Distribution”

1 SUMMARY

Different models lead to different predictions about how the distribution of plant productivity changes over the cycle. This paper empirically tests two competing hypotheses. The Schumpeterian framework suggests that recessions are cleansing – the process of creative destruction forces bad firms to exit in a downturn so that the economy gets more productive overall. On the other hand, if firms compete for production factors, as in the Melitz (2003) model, the reduced factor prices in recessions will allow bad firms to survive, so that recessions are generally sullyng and the economy becomes less productive.

Using a long establishment-level panel constructed from the Census of Manufacturers, Annual Survey of Manufacturers, and the Longitudinal Business Database provided by the U.S. Census Bureau, the author finds evidence that recessions are on average sullyng. This is driven by firms at the bottom tail getting less productive, while those at the top end of the distribution do not see productivity decreases. The dispersion in the productivity distribution is shown to be countercyclical, lending credence to the sullyng hypothesis as lower productivity firms can survive in a recession. This effect is shown to be stronger in durable goods manufacturers than in non-durable manufacturers. The result is robust to calculating productivity with Solow residuals or the Olley-Pakes (1996) procedure.

The author then builds a model to rationalize the observed data. In his model, a fixed cost of operation generates endogenous exit in the face of aggregate productivity shocks. The general equilibrium effects allow for both cleansing and sullyng effects to exist, but the baseline calibration shows that sullyng dominates. The result is stronger for durable goods sectors, which are assumed to have a higher fixed cost of management.

This paper is a strong contribution to the literatures on productivity and business cycles. The empirical work is carefully done, and presents valuable new facts. Measuring productivity is difficult, but the author carefully discusses and justifies the assumptions required for measurement. However, the model is superfluous to the paper, and there remain some additional empirical work to be done.

2 COMMENTARY

2.1 EMPIRICAL WORK

As stated above, the empirical work in this paper is carefully done and generally believable. Suitable robustness to the estimation of productivity is provided, and the results continue to hold. There are three additions I would suggest:

1. Figure 13 in the appendix presents the raw time series of the author’s measure of productivity dispersion. The figure shows a clear upward trend in productivity dispersion. This fact is, to my knowledge, new and potentially important. It should be given much more treatment in the main body of the text. Does this upward trend come from reallocation to more dispersed

industries? Or are all industries getting more dispersed? Examining these secular trends is important for selecting between mechanisms determining endogenous countercyclical productivity dispersion. For instance, if the claim is that productivity dispersion is countercyclical primarily because of fixed costs, some argument should be made that fixed costs are becoming more prominent determinants of the productivity distribution over time.

2. The author's measure of productivity dispersion is the median (across industries) standard deviation of normalized productivity within an industry. The author provides robustness to the measure of variance, and the result continues to hold. But the author only examines within-industry productivity dispersion. To get a sense about the productivity distribution in the full economy, the author should present more moments of the dispersion distribution. Do some industries get much more dispersed in recessions, while others get less dispersed? What kinds of industries fall into these categories? Do the more countercyclical industries tend to be a growing or shrinking share of the economy during recessions? And is the median industry the same across recessions? It's possible that the median industry has countercyclical dispersion but all the countercyclical industries shrink greatly in recessions, which leads to aggregate procyclicality in dispersion.
3. The above exercise will also shed some light on the mechanisms driving this countercyclical dispersion. I presume the author includes the model in order to elucidate a mechanism that could give the observed empirical results. But the reader must operate on faith that durable goods manufacturers have higher fixed costs of management than do non-durable goods manufacturers.

The model is unnecessary for the thesis of the paper. The paper's goal is to test between two existing models to ascertain whether recessions are cleansing or sully. This is done in the empirical section. Perhaps the model could be moved to the appendix to provide readers a framework through which to interpret the results. This would free up space for the additional analysis suggested here. However, empirical tests of some proposed mechanisms would be welcome. Do the results hold if we project the industry-level dispersions onto exit and entry rates first? Do these mechanisms align with the trend observed in Figure 13?

3 MINOR ISSUES

- There are a number of typos throughout the paper, including a number of question marks in the calibration table.
- The author uses the Olley-Pakes procedure as his main method to construct productivity measures. This procedure requires that investment is a strictly increasing function of productivity. Therefore, he must throw out all establishments which have 0 investment, which amounts to only 15% of establishments. This number is surprisingly low. I imagine there are a large number of very small maintenance investments, which may be uncorrelated with productivity. The authors should present some summary statistics on investment.