

Online Appendix to:

Declining Dynamism, Allocative Efficiency, and the Productivity Slowdown

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Figure A1 reports average annual aggregate labor productivity growth, for three different time periods, from official BLS data and from RE-LBD microdata. As noted in the main text, our RE-LBD numbers are constructed using different source data and methodology from BLS statistics. In particular, we construct labor productivity by detailed 6-digit NAICS industry as total industry revenue divided by total industry employment, where revenue is deflated using BEA deflators (typically at the 3-digit or 4-digit level). We construct an economywide aggregate by taking the weighted average of industry productivity, where weights are calculated based on each industry's share of aggregate employment, averaged over the 1997-2013 period. Hence, industry weights are held constant to abstract from cross-industry variation in gross output per worker.

Figure A1 shows that our microdata-based productivity numbers are reasonably similar to official BLS data. We closely match average annual productivity growth for the 1997-1999 period, and we find a somewhat stronger decline in average growth from this initial period to the 2004-2006 period than is reported by BLS. Generally, though, we obtain figures that are remarkably consistent with official statistics.

* Board of Governors of the Federal Reserve System, University of Maryland and NBER, U.S. Census Bureau, and U.S. Census Bureau, respectively. We gratefully acknowledge financial support from the Kauffman Foundation. Cody Tuttle provided excellent research assistance. Any opinions and conclusions expressed herein are those of the authors and do not necessarily represent the views of the U.S. Census Bureau or of the Board of Governors or its staff. All results have been reviewed to ensure that no confidential information is disclosed.

Figure A2 reports average 90th percentile rates of within-firm productivity growth by firm employment class. We first obtain the 90th percentile of firm-level growth in labor productivity (for continuer firms) by industry, where the percentile is based on the unweighted distribution of the industry. We then average these 90th percentiles using time-invariant industry employment weights as above. We do this for each size class and for all firms. The average 90th percentile falls over time within each size class, with larger declines among larger firms. Figure A3 follows the same concept as Figure A2, but we instead take the 90th percentile of the employment-weighted distribution within industries. Weighted 90th percentiles show a downward-stepping pattern in within-firm productivity growth that is similar to unweighted 90th percentiles, again suggesting a decline in productivity growth among the highest-performing firms (even within size classes). Note that these exercises, which track only the top part of the within-firm productivity growth distribution, are mechanically reflected in the covariance term of Dynamic Olley-Pakes (DOP) decompositions described in the main text. This term is typically interpreted as a measure of allocative efficiency, but it captures these notable patterns among firms with high within-firm productivity growth.

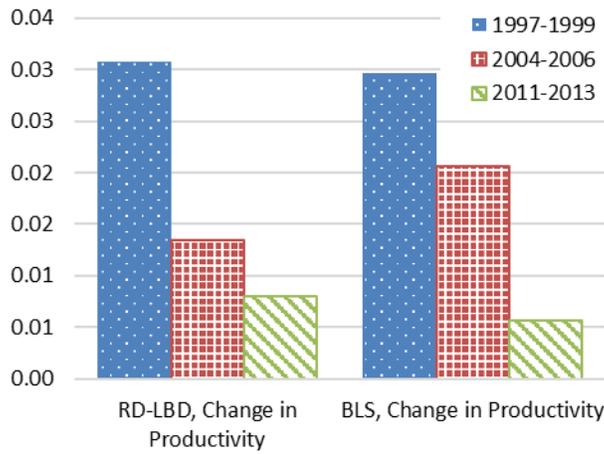
Figure A4 reports the “within” term of the DOP decomposition constructed separately for each size class. These data add nuance to the economywide results described in the main text. Within-firm productivity growth is negative on average (unweighted) for small firms, though among the smallest firms it actually became less negative from the late 1990s to the mid 2000s. Among the largest firms, productivity growth was positive in the late 1990s but stepped down thereafter.

Figure A5 reports the “within” term of the Foster Haltiwanger Krizan (FHK) decomposition, again performed separately for each size class. Recall that this method

highlights the employment-weighted average of within-firm productivity. These terms are positive across the entire firm size distribution, indicating that larger firms have higher productivity growth even within size classes. Within-firm productivity growth stepped down from the late 1990s to the mid 2000s for the larger size classes. Taken together, Figures A4 and A5 show very different productivity dynamics for small and large firms, with slight improvements among small firms but declines among larger firms during the period of the aggregate productivity slowdown. Declines in within-firm productivity growth among some firms suggest that the productivity slowdown is not entirely a story about allocative efficiency, but the size-dependent nature of changes in firm-level growth highlights the complex interaction between allocative efficiency and within-firm improvements.

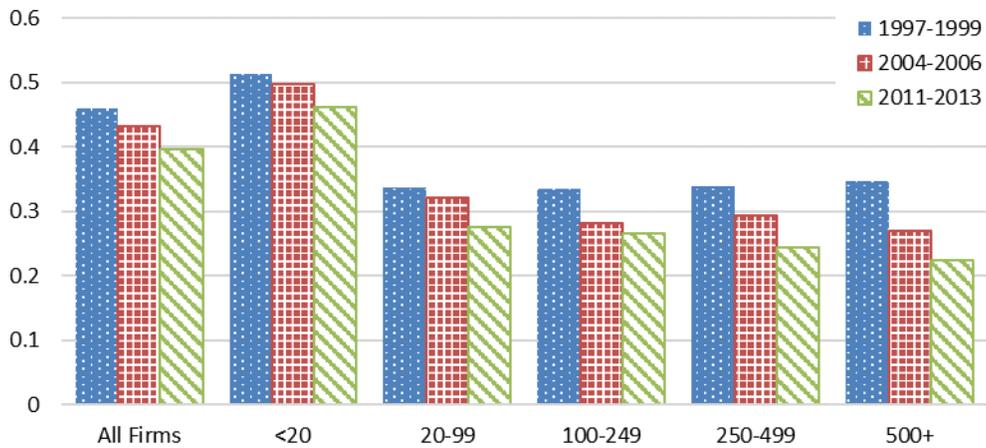
Figure A6 reports the difference between the FHK and the DOP “within” terms, again by size class. This exercise is inspired by equation 3 from the text, which shows that the difference between the FHK and DOP terms depends on the correlation between firms’ initial employment shares and their within-firm productivity growth. Positive covariance between initial size and productivity growth can be interpreted in allocative efficiency terms. Figure A6 shows that this difference is positive but declining for all size classes.

Figure A1: Annual Productivity Growth



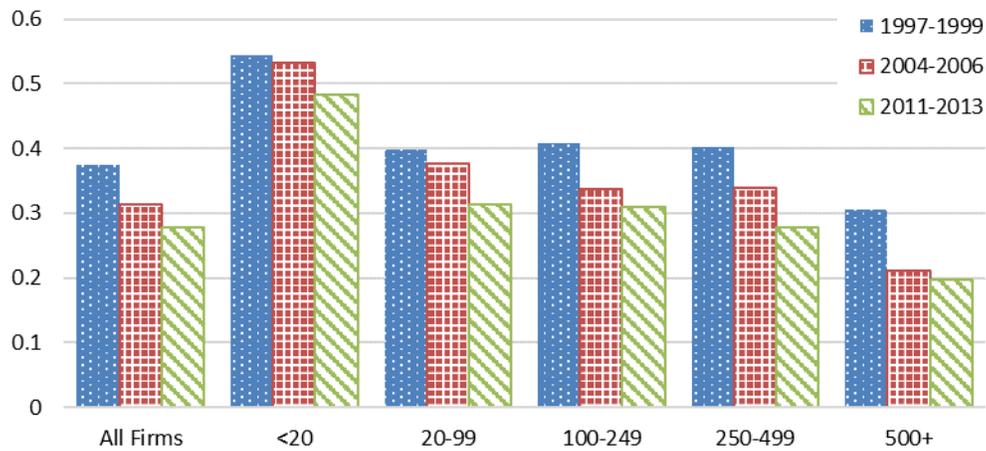
Source: RE-LBD, BLS, and author calculations.

Figure A2: Average 90th Percentile Growth Rates (Unweighted)



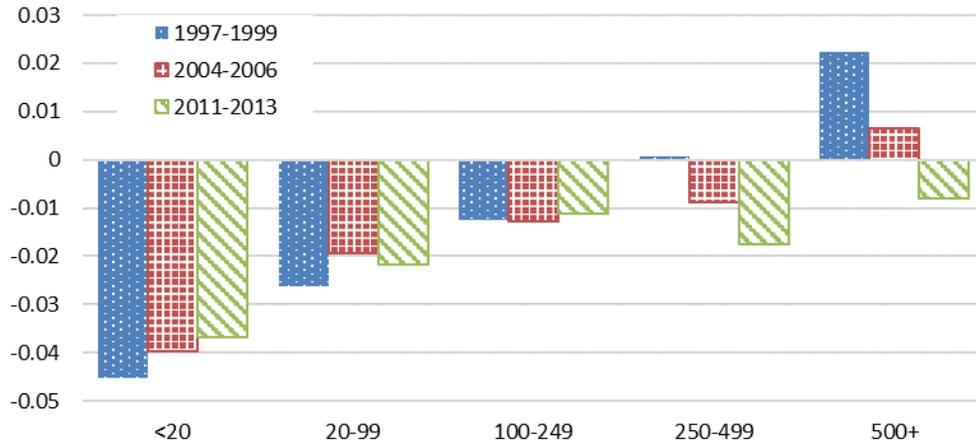
Source: RE-LBD and author calculations.

Figure A3: Average 90th Percentile Growth Rates (Weighted)



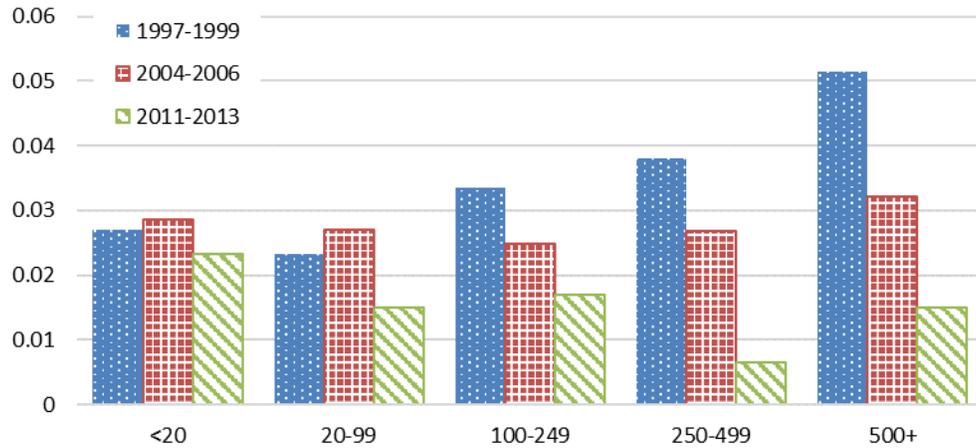
Source: RE-LBD and author calculations.

Figure A4: Within-firm Productivity Growth by Firm Size (DOP Method)



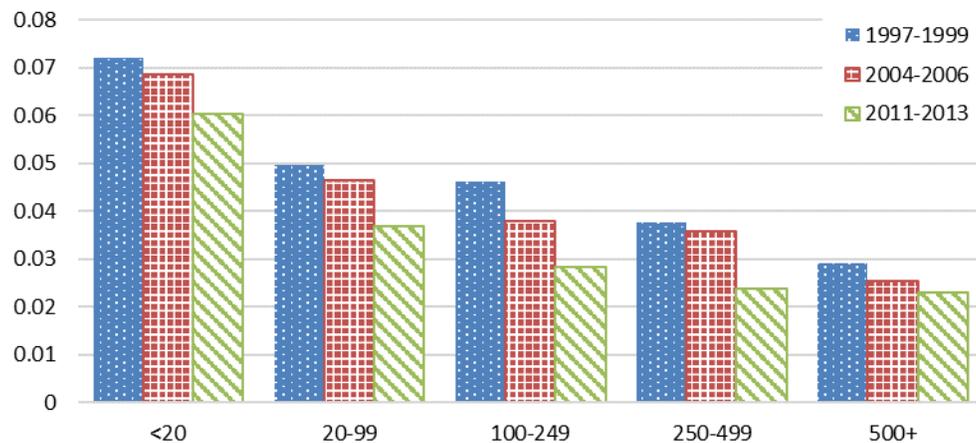
Source: RE-LBD and author calculations.

Figure A5: Within-firm Productivity Growth by Firm Size (FHK Method)



Source: RE-LBD and author calculations.

Figure A6: Difference Between FHK and DOP “Within” Terms



Source: RE-LBD and author calculations.