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Firm Size Dynamics of Industries: Stochastic Growth Processes, Large Fluctuations, and the Population of Firms as a Complex System

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Purpose

With the emergence of various longitudinal data sources for firms, studies on business size distributions, business turnover, and business growth/decline have had a resurgence among the academic community. This study was conducted to better understand the dynamic nature of the growth and decline of firms in various size classes and industries.

Overall Findings

Firm growth rates do not fit the often assumed normal distribution. As a result, there are more slow-growing firms, more fast-growing firms, and fewer medium-growing firms than are generally modeled by economists. This finding held for all industries analyzed and growth rates were unrelated to establishment size.

Highlights

• The distribution of the growth of firms mapped a pyramid shape of the Laplace distribution rather than the inverted u-shape of normal distribution. Hence, business growth tends more to the tails (or extreme gains and losses) and less to the median than is commonly believed.

• Looking at the North American Industry Classification Systems' (NAICS) 20 major industry sectors revealed differing mean growth rates but similar distributions and variances. Particularly surprising was the similar results from two industries that had negative mean growth rates. The finance industry was unique in that its pyramid shape had convex curved sides. This may have been a result of the time period chosen as equity markets were exploding from 1998 to 1999.

• Both small and large size classes exhibited similar distributions of growth rates and variances. The similar variance findings differed from previous research.

• This research is an exciting first step into growth analysis that generated some interesting questions such as would more detailed industry classes produce differing results, would these results hold up for the growth distribution of firms by age instead of size and is there persistence among the growth of establishments over time?

• With the findings from this report, economists will have to reevaluate their econometric tools when modeling the growth of businesses.

Scope and Methodology

The researchers utilized special tabulations from the U.S. Census Bureau's Statistics of U.S. Business (SUSB). SUSB excludes farms but includes nearly all employer firms in the U.S. Establishments (or business locations) surviving from 1998 to 1999 were the basis for the study which employed a method to approximate firm size associated with the establishments. Establishments that opened and closed during the period were not included in the analysis. Note that the Office of Advocacy is a partial funder of the SUSB.

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The log of growth rates for establishments were charted and checked with a Kolmogorov-Smirnov goodness-of-fit test to determine statistically if they more closely matched a normal or Laplace distribution.

This report was peer-reviewed consistent with Advocacy's data quality guidelines. More information on this process can be obtained by contacting the Director of Economic Research at advocacy@sba.gov or (202) 205-6533.

Ordering Information

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