

# Economics 641

## Problem Set 2

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### 1 The Firm Size Distribution

Download the Compustat data here: [https://www.dropbox.com/s/rcujpfsm9c4z7r8/PanelAnnual\\_compustat1980\\_2015.dta?dl=0](https://www.dropbox.com/s/rcujpfsm9c4z7r8/PanelAnnual_compustat1980_2015.dta?dl=0)

Use Gabaix's survey article, esp Section 7, for guidance and greater detail: <http://pages.stern.nyu.edu/~xgabaix/papers/pl-ar.pdf>

#### 1.1 Power Law In Firm Size

Take the data for (fiscal) 2015. Generate log firm size by taking the log of firm sales. Generate the rank of the firm by size (this should be done for each year separately. Plot one against the other. Does the relationship look linear? Estimate the power law coefficient by using the estimator proposed by Gabaix and Ibragimov (2011). What is the coefficient estimate? What happens to the power law coefficient estimate as you raise the lower size cutoff (that is, drop more and more firms at the bottom of the size distribution?

Repeat the exercise for employment. How does the power law coefficient for employment compare to the sales one?

Repeat the exercise for 1-digit SIC sectors individually. How much do the power law coefficients differ across sectors? Are all sectors "granular"?

Repeat the exercise for data for 1985. How do the results compare to 2015?

#### 1.2 Size-Volatility Relationship

Compute the sales growth rate for each firm in each year. Compute the standard deviation of each firm's sales growth rate over the entire period the firm is present in the sample. Regress the log standard deviation of firm sales growth on the log of firm size (you can take the average firm sales over the period it is present in the data, after adjusting for inflation). What is the coefficient? What happens when you add sector fixed effects?

Repeat the exercise for each decade separately. Is the size-volatility relationship stable over time?