Growth and Firm Size Distribution: An Empirical Study of Listed E-Commerce Companies in China

Wei Zhang, School of Information, Central University of Finance and Economics, Beijing, China
Yan-Chun Zhu, Business School, Beijing Normal University, Beijing, China
Jian-Bo Wen, School of Foreign Studies, Central University of Finance and Economics, Beijing, China
Yi-Jie Zhuang, Technical Infrastructure, Google Inc., Mountain View, CA, USA

ABSTRACT

Studies on the firm’s size distribution (FSD) can set a good foundation to know about the growth path and mechanism of e-commerce firms. The purpose of this paper is to understand features of the China’s listed e-commerce firms by testing Gibrat’s law and Zipf’s law within the Internet sectors. From a macroscopic perspective, with the approach of OLS estimation, Zipf’s coefficient of the FSD is calculated to test whether Zipf’s law holds. From a microscopic perspective, the relationship between e-commerce firm size and growth is explored by quantile regression method. The results indicate that from 2005 to 2014, Zipf’s law cannot be rejected, with the relationship changing over time, Gibrat’s law holds partly. It implies that competition status among China’s e-commerce firms becomes more stable.

KEYWORDS

E-Commerce Firm, Firm Size Distribution, Gibrat’s Law, Zipf’s Law

1. INTRODUCTION

With the growing popularity of information technology, as an important part of the emerging new industry, Internet industry enters into different fields, and accelerates the integration of the various areas. It also plays an important role in driving economic growth and promoting the economic transformation.

Till the year of 2013, the number of China’s B2B firms reached 11,400 with an increase of 4% compared with last year. There are about 24,620 of B2C, C2C and other non-main stream firms (China e-Business Research Center, 2013). According to China E-commerce “Twelve-Five plan”, it is estimated that by the year of 2015, small and medium-sized firms (SME) using e-commerce will take up 60% among SME. A survey report by China e-Business Research Center, by the end of first half year 2015, national e-commerce transactions amounted to 7.63 trillion RMB, rising by 30.4% compared to last year. Wherein the B2B transaction size is over 5.8 trillion RMB with year-on-year growth of more than 28.8%. According to statistics of China e-Business Research Center (2015), the online retail market deal reached 1.61 trillion RMB, with a year-on-year increase of 48.7%. The total volume of online retail takes up 11.4% of all social consumable total retail sales with an increase of 31% compared with last year’s 8.7%.

DOI: 10.4018/JECO.2016040105

Copyright © 2016, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.
Though China’s Internet industry grows fast, there still exist risks and challenges triggered by its internal structural evolution. For example, compared with the traditional business, what are the characteristics of the size distribution in the process of e-commerce firm’s growth? What is the relationship between firm size and growth? Are small businesses growing faster than large firms? All of the questions have attracted the attention of the academic world (Davidsson, Achtenhagen, and Naldi, 2010; You, Miao, and Liu, 2013; Nason and Wiklund, 2015).

In the current research on the firm size distribution, the researchers focus on the description of the characteristics of firm size and try to analyze the growth motivation only by testing whether Gibrat’s law or Zipf’s law is true or not, based primarily on sample data from services, manufacturing, finance, retail and other traditional industries (Davidsson, Achtenhagen, and Naldi 2010). However, the current studies on the business growth are limited to traditional industries and rarely involve the emerging Internet industry. Compared with the traditional firms, e-commerce firm relying on the Internet, cloud computing, networking and other IT technology has distinct characteristics of network economics, and its growth size distribution displays new features and new law (Stam, 2010).

Based on the annual report data of China’s listed e-commerce firms, this paper attempted to reveal the size distribution characteristics of e-commerce firms by checking whether the Zipf’s law is true from the macro level. And then, from the micro level, this paper examined the relationship between firm size and e-commerce firms’ growth rate to explore growth path with the help of Gibrat’s law empirical analysis.

2. LITERATURE REVIEW

Firm size distribution is one of the core issues of modern firm theory (Davidsson, Achtenhagen, and Naldi 2010; Nason and Wiklund, 2015). With the analysis of firm size distribution, researchers and policy makers can know about the concentration degree of the specific industry, have an insight into the industry’s business cycle and timely implement anti-monopoly policy (Kang et al, 2011). Thus, in recent years, practitioners and scholars began to focus on firm size distribution problems. Distribution law and feature research have become an important task in the field of economics, economic physics, management science and other areas. Currently, the researches on firm size distribution were mainly concentrated in the Gibrat’s Law and interpretation (Nason and Wiklund, 2015).

In 1931, Gibrat built a dynamic model of firm size and industry structure and proposed Gibrat’s law under his name. Assuming that the initial size of the firm is the $S_t$, from the first period $t-1$ to $t$, the business growth rate is $\eta_t$, which is calculated from the equation $\left( S_t - S_{t-1} \right) / S_{t-1} = \eta_t$. To transform and expand the model, another equation $s_t = s_{t-1} (1 + \eta_t) = s_0 (1 + \eta_0)(1 + \eta_1)\ldots(1 + \eta_t)$ can be given. After adapting logarithmic method to both sides of the model, $\log s_i \approx \log s_0 + \sum_{s=1}^{t} \eta_s$ can be obtained. When $t$ goes to infinity, $\log s_t \sim N(\eta t, \sigma^2 t)$, it means that that firm size distribution converges to lognormal.

Inspired by Gibrat’s law, many scholars investigated firm size distribution law based on the empirical data from manufacturing, mining, transportation and other traditional industries. They concluded that corporate growth was a random process independent of the initial size, and the firm-size distribution converged to lognormal distribution law, which proved Gibrat’s Law. As an example of empirical study conducted by Hart and Prais (1956), it was found that firm size distribution converged to lognormal distribution. By using quantile regression, Serrasqueiro et al (2010) analyzed the growth of SMEs in Portugal motives, and found that the size distribution of small businesses was in accordance with Gibrat’s Law. Piergiorgio (2010) studied the correlation between firm age and size, and found that business life cycle affected the firm size distribution, but the size met the Gibrat Law when entering into size of the equilibrium state. Chen’s results revealed that the size of China’s...
Integration and Enterprise Architecture Challenges in E-Government: A European Perspective
[www.igi-global.com/article/integration-enterprise-architecture-challenges-government/1512?camid=4v1a](www.igi-global.com/article/integration-enterprise-architecture-challenges-government/1512?camid=4v1a)