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Extended Abstract

The Determinants of Firm's Growth in the Telecommunication Services

Industry: Empirical Evidence from India

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Abstract

The study of firm growth literature provides valuable insights into firm behavior, the evolution of the industry over time, and the overall growth process. The topic becomes even more relevant in the context of the high growth of this sector and the importance of ICT firms in bridging the information asymmetry and overall process of economic growth. This study investigates the factors determining the firm's growth in the Indian telecom services sector using an unbalanced panel of 204 firms from 2000 to 2019. Dynamic Panel estimation technique System GMM is used to take care of endogeneity issues caused by the dynamic nature of firm growth models. Results indicate that the growth of firms in the Indian telecom services industry is explained by systematic factors like size, R & D intensity, asset turnover, import, and age of the firm and is not random.

KEYWORDS: Firm Growth, ICT, Telecommunication, System GMM, Dynamic Panel.

**The Determinants of Firm's Growth in the Telecommunication Services Industry:
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Extended Abstract**

1. Introduction

The dynamics of firm growth has been a topical research area, with a vast body of literature providing valuable insights on firm behavior. Knowledge about determinants of a firm's growth assumes importance as it provides meaningful insights into working of corporate strategic behavior, the evolution of industry structure over time, and ultimately to the growth of the overall economy. The earliest contributors to the field are Gibrat (1931) and Penrose (1959). While Gibrat's law implies that firm growth follows a random walk suggesting that large and small firms grow at the same rate, Penrose's vision of the firm emphasized the importance of learning and doing and stated that firm's growth is linked to their knowledge and not linked to size per se. Several studies have been done in the developed country context that validates and proves, and disprove these theories. Despite a vast literature on the growth of firms, empirical work that examines the growth of firms in the ICT industry in India are few. The topic becomes all the more relevant in the context of the high growth witnessed in the sector. India is currently the world's second-largest telecommunication market after China, with total subscribers as high as 1173.83 million as of December 31st, 2020 (TRAI subscription report). The industry has undergone a tremendous structural change from a monopoly to an oligopoly, with several mergers and consolidations in the last decade. At the same time, the industry is suffering from increasing cost structure and accumulation of debt. Against this background, this study intends to analyze the performance of the firm and the determinants of firm growth in the telecommunication services sector in India.

2. Literature Review

2.1 Growth and Size relationship

In the literature of industrial economics, one of the most conflicting and intensively researched issues, Gibrat's law, states that firm growth does not depend on its size or previous growth history (Gibrat, 1931). Several studies find support for this hypothesis (Audretsch et al. 2004), while others find contradictory evidence (Evans 1987; Piergovanni et al. 2003) suggesting that firm growth is negatively related to firm size, i.e., a smaller firm grows faster than the larger one.

Penrose (1959) provides the earliest contribution to the firm growth literature in the well-known "Penrose effect". While Penrose attributes firm growth to learning by doing and internal resources, he argues that large firms will eventually face managerial constraints and increased operational costs leading to a decrease in profit persistence. In other words, the Penrose effect is related to the managerial constraint on the rate of growth of firms, and it predicts that there exists a negative correlation between growth rates in the successive period. Thus, the firm growth rate does not persist over time, and smaller firms may eventually catch up. Geroski (2005) contradicts the Penrose effect and argues that skills related to core competencies are durable and cannot be imitated and thus gives a persistent competitive advantage to some firms and therefore lead to persistent profit differences between firms. Such polar opposite findings can be attributed to reasons such as the nature of the industry, time frame, and the scale of the firm.

Canarella and Miller (2018) study the determinants of firm growth in the U.S. telecom sector and find evidence contrary to Gibrat's law. Results suggest that agency cost, financial leverage, R & D investment, and financial performance are important determinants of firm growth.

2.2 Innovation

Innovation is considered one of the key factors of firm success and survival as it provides the firm with a continuous competitive advantage. In an industry based intensively on technology changing rapidly, companies must improve their technical capacity to have a favorable position in the market.

Empirical studies find a positive relationship between Growth and R&D (Liu et al. 1999, Jaisinghani, 2016). Recent studies also indicate a positive impact of lagged R&D (Chen et al., 2019). Chen et al. (2019) study the impact of R & D intensity on the performance of the listed Taiwanese industry for 2005 and 2016 and finds that R & D expenses in the current year negatively impact business performance. However, lagged value of R & D impacts business performance positively. He argues that significant R & D expenses may reduce firm performance in the same period and continue to influence it in the next period.

2.3 Financial Measures.

The firm's financial structure, such as profitability, asset turnover, and leverage, can play an essential role in the firm's growth as it proxies the firm's capacity to access resources that are important for the growth and survival of firms. For example, Oliveira and Fortunato (2006) study the firms in the service sector in Portugal from 1995 to 2001 and finds that financial measures like profitability and financial leverage significantly explain the firm growth. However, empirical studies find mixed evidence in this regard.

2.4 Age

The empirical literature suggests a negative relationship between firm growth and age, suggesting that newer firms grow at a faster rate than older firms (Evans 1987). Cowling (2004) finds a strong negative relationship between age and the profit of the firm. He argues that this negative relationship can be due to the inability of older firms to generate more profitable ideas or due to older firms operating in a more mature market having exhausted their profit potential and therefore having little opportunity to grow.

2.5 Trade

The massive expansion of the telecom network in India is paralleled by the import of telecom equipment. Mishra et al. (2020) highlight the importance and potential of import to influence the manufacturing capacity of the telecom sector in the context of India. Wagner (2019) infers a positive relationship between import and firm productivity, and there remains a significant productivity differential between firms that engage in international trade and the firms that do not.

There exist plenty of studies to explore determinants of growth of firms in general but only a few analyses the growth of firms in the telecom industry in particular. Also, with respect to India, studies related to the analysis of determinants of a firm's growth in the telecommunications industry are scanty. Few studies that analyze the performance of firms are based on measuring the relative efficiency of firms based on cross-sectional data. This study intends to bridge the gap by analyzing determinants of firm growth in the telecommunication services industry based on the firm-level data for 2000-2019.

3. Data and Methodology

To analyze the determinants of firm growth, the sample for the study consists of an unbalanced panel of 204 firms in the Indian telecom services sector for 2000-2019. The annual firm-level data for the study has been extracted from the Prowess database of the Centre for Monitoring Indian Economy (CMIE).

This study employs econometric analysis techniques for dynamic panel data to analyze the determinants of growth of the firm in the telecommunication industry. Dynamic Panel estimation (System GMM) is useful when time-invariant unobservable factors affect both dependent and independent variables, and some explanatory variables are related to past values of the dependent variable. For example, the growth of a firm can depend on the lagged value of firm growth, and also explanatory variables such as R & D decisions and the firm's financial structure can depend on past values of firm growth. System GMM estimation technique for dynamic panel model is adopted to overcome unobserved heterogeneity, persistence, and endogeneity.

4. Results

Initial results indicate that the firm's size has a positive impact on firm growth, whereas size-squared and age have a negative impact on firm growth in the Indian telecom services industry. Thus, relatively newer firms have higher growth rates. Also, asset turnover has a negative effect on the growth rate of the firms. Additionally, system GMM estimation results also suggest that the previous year's growth rate and market share have a significant positive impact on the firm growth, whereas R & D intensity and import of raw materials are negatively related to the growth rate of firms.

5. Conclusion and Discussion

The growth of firms in the Indian telecom services sector is explained by systematic factors like size, asset turnover, age, market share, and import and is not random. This study includes only the telecom services industry for the period 2000 to 2020. Therefore, examining the factors determining growth factors in other sectors of the ICT industry may prove helpful in examining the validity of the results.

References:

1. Audretsch, D., Klomp, L., Santarelli, E. et al. Gibrat's Law: Are the Services Different?. *Review of Industrial Organization*, 24, 301–324 (2004).
2. Canarella, G., & Miller, S. M. (2018). The determinants of growth in the U.S. information and communication technology (ICT) industry: A firm-level analysis. *Economic Modelling*, 70, 259–271.
3. Chen, Tsung-Chun., Guo, Dong-Qiang., Chen, Hsiao-Min., & Wei Tzu-ti (2019). Effects of R&D intensity on firm performance in Taiwan's semiconductor industry, *Economic Research-Ekonomska Istraživanja*, 32:1, 2377-2392
4. Cowling, M. (2004). The Growth – Profit Nexus. *Small Business Economics*, 22(1), 1–9.
5. Evans D. S. (1987b) Tests of Alternative Theories of Firm Growth. *Journal of Political Economy*, 95, 657–674.
6. Gibrat R. (1931) *Les Inégalités Économiques*. Paris: Librairie du Recueil Sirey.
7. Geroski, P. A. (2005). Understanding the implications of empirical work on corporate growth rates. *Managerial and Decision Economics*, 26(2), 129–138.
8. Jaisinghani, D. (2016). Impact of R&D on profitability in the pharma sector: an empirical study from India. *Journal of Asia Business Studies*, Vol. 10 No. 2, pp. 194-210.

9. Mishra, B., Ghosh, S., & Kanjilal, K. (2020). Evaluation of import substitution strategy in Indian telecom sector: Empirical evidence of non-linear dynamics. *Telecommunications Policy*, 44(7), 101998.
10. Oliveira, B., & Fortunato, A. (2008). The dynamics of the growth of firms: evidence from the services sector. *Empirica*, 35(3), 293–312.
11. Penrose, E. (1959) *The Theory of the Growth of the Firm*. Basil Blackwell, Oxford.
12. Piergiovanni, R., E. Santarelli, L. Klomp & A. R. Thurik (2003). Gibrat's Law and the Firm Size/Firm Growth Relationship in Italian Services. *Revue d'Economie Industrielle*, 102, 69–82.
13. Liu, Jin-Tan., Tsou Meng-Wen., & Hammit, J.K. (1999). Export Activity and Productivity: Evidence from the Taiwan Electronics Industry. *Weltwirtschaftliches Archiv*, 135(4), 675-691.
14. Wagner, J. (2019) Effect of international activity on firm performance. *IZA World of Labor* 2019: 47v2.

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