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Manufacturing Firm Size Distribution in Iran Evidence from Food & Beverages and Non-Metallic Mineral Products

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Abstract

Empirical studies have shown that the size distribution of firms can be described as a lognormal or Pareto distribution. However, these studies have focused on developed countries and little attention has been devoted to developing countries. Using the variable of number of employees as a measure of firm size, this paper investigates the shape of firm size distribution in the food & beverages industry and also in the non-metallic mineral products industry over the period of 1997-2005. Our findings show that there is no universality of the size distribution of firms between industries. In other words, the size distribution varies in terms of kind of industry, so that our results make it clear that food & beverages industry follows lognormal distribution, conversely to other industry which a good representation of Pareto distribution. From policy point of view, knowledge about firm size distribution caused new entrance firms to decide wisely and therefore provide improvement on performance after entry.

Keywords: Firm Size Distribution, Lognormal Distribution, Pareto Distribution, Manufacturing Industries, Iran.

JEL Classification: L11, D22, C46

1. Introduction

Firm size distribution (FSD here after) has long been an issue of interest to researchers, especially those working in the fields of economic modeling, competition policy and the impact of government regulation (Schaper *et al.*, 2008:719). In fact, FSD in an industry is an important element of market structure which affects the industry concentration. Due to the fact that FSD reflects the organization of output in an economy, this issue has always been considered in economic researches. Therefore, researchers and policymakers often use it to implement antitrust policy.

The static FSD that we observe in practice are the cumulated result of underlying firm dynamics involving entry of new firms and growth,

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decline, and exits of incumbent firms. Knowledge about firms' behavior in time of entry and adapting to the optimal size can provide valuable information on the characteristics of firms in the industry. However, it is expected that new entrants firms adjust themselves to the optimal size over time due to the fact that failure to adapt not only waste the resources, but also cause variety of social problems.

Despite the widespread studies in developed countries, this issue rarely performed in developing countries. Therefore, in this paper, we investigate the FSD in the case of Iran in the period of 1997-2005. Our focus is to look at the distribution in two foremost industries namely food & beverages industry and non-metallic mineral products industry. With this aim, the paper is organized as follows. In section 2, we briefly discuss the stylized facts of FSD along with reviewing some researches performed in this field. Section 3 and 4 gives some facts about introducing models used in this paper and also the estimation method. Section 5 discusses the findings and finally in Section 6, conclusions are provided, together with an implication.

2. FSD: Literature Review and Stylized Facts

The FSD in industrial countries shows that a small number of large firms coexist with a large number of small firms which is indicates the market structure and therefore, the degree of concentration. So, a long established feature of industrial economics is that most industries are characterized by a fairly right skewed size distribution of firms, meaning that much of the probability mass lies to the right of the modal value.

Since the seminal work of Gibrat (1931), skewed distributions have received considerable attention in lots of studies. In fact, Gibrat, with stating the Law of Proportionate Effect (LPE here after), has shown that firm growth follows a random walk and so, growth of firm is independent of observable characteristic of firm including size or past growth. In other words, firms’ growth rates are independent of their initial size. Therefore, LPE has shown that if firms’ growth is randomly distributed, then the FSD would be skewed and approaches to a lognormal distribution. This issue has been studied extensively in economic literature with mixed empirical evidence. For instance, Hart and Paris (1956), Sutton (1997), Bottazzi *et al.* (2002), Geroski *et al.* (2003) and Reichstein *et al.* (2005) in empirical studies have shown that FSD is highly skewed and the lognormal distribution is a good fit to the empirical one, whereas Audretsch *et al.*

(2004), Lipczinsky *et al.* (2005), Oliveira and Fortunato (2008) and Lotti *et al.* (2009) have found that Gibrat's Law is most likely rejected. Also, on the theoretical side, Jovanovic's model (1982) of 'noisy selection' which states efficient firms grow and survive and inefficient firms decline, questioned early studies on the dynamics of industries that found no relation between size and growth rates of firms.

Although Gibrat have introduced the idea that firm size is precisely lognormally distributed, but further researches, starting with Simon and Bonini (1958), have often described the FSD by the Yule or Pareto (also known as Power Law) distribution. In fact, the Power Law predicts that the frequency of firms above a certain size (or a minimum size) is inversely proportional to firm size (Cefis *et al.,* 2009). Overall, it can be stated that there is no generalization on the shape of FSD. On this matter, Hall (1987) has discovered that FSD may changes over time and may differ from lognormality (Cabral and Mata, 2003). On the other study, Axtell (2001) has found that correct results on the shape of FSD can be obtained only when the right proxy for firm sizes adopted. Also, he has shown that the Power Law (or Pareto) distribution is a good fit to the empirical one. In addition of these studies, some scholars (ex, Cefis *et al.,* 2009) have argued that the FSD as a whole follows a Power Law. Gaffeo *et al.* (2003) has analyzed the average size distribution of a pool of firms from G7 countries over a 13-year period and for different proxies for firm size. They found that the empirical distributions are all consistent with a Power Law but the resulting distribution generally is not of the Zipf type. In comparison of size distribution of Japanese and US companies, Kaizoji *et al.* (2006) have analyzed the FSD in terms of sales and total assets of the separate financial statement of the Japanese and the US companies. The results of the investigation have showed that the size distribution of the US firms is approximately lognormal, in agreement with Gibrat's observation, and in contrast, the size distribution of the Japanese firms is clearly not lognormal, and the upper tail of the size distribution follows the Pareto Law.

Regards to the upper tail of firm size distribution, Cirillo and Hüsler (2009) in the case of Italian firms have obtained Pareto Law with the value of α in the vicinity of 1.8 for almost 20 years. In addition, the same value is persistent even after data aggregation. More recently, Kang *et al.* (2011) using the data of the non-financial firms listed on the stock markets have showed that the upper tail of the Korean FSD can be well described by Power Law distributions.

However, most of the previous studies in this line mainly pay their attention to the cases of developed countries. Given that FSD depends on the economic structure of each country, the distribution of firm sizes in developing countries is also an interesting issue to be examined. To date, few studies have been performed for developing countries. To the best of our knowledge, in the case of analyzing upper tail of FSD, the studies of Zhang *et al.* (2009) and Lee & Hsu (2014) are the only studies performed on this issue. With analyzing the data of top 500 Chinese firms, Zhang *et al.* have revealed that their revenues and ranks obey the Zipf's law with exponent of one for each year in the period of 2002 to 2007. But, the study of Lee & Hsu have shown that FSD of the top 100 Taiwan business groups deviated from the Zipf’s law.

Bhalla and Mukherji (2010) have analyzed the FSD of micro, small and medium enterprises in the period of 1999-2001. Based on two measures of firm size, gross value of output and employees, and also with the use of Kernel density estimation, they have shown that FSD is lognormal just in terms of gross value of output. Also, as firm ages, FSD has become less skewed and more lognormal.

Although examining FSD is an important issue, nevertheless In Iran, as a developing country, only one research on this topic has been performed by Feizpour et al. (2014). In this study, using Kernel density method, authors had examined the theories of active and passive learning. The results of their study had showed that although firms follow the passive learning based on number of employees as a measure of firm size, but this finding is in contrast with the results obtained in terms of output value and value added which adjust themselves to the optimal size, converge to the lognormal distribution and so follow active learning.

In total, there is a theoretical debate about whether FSD are best modeled using a lognormal distribution or a Power Law one. In particular, our main debate in this paper is whether firms are distributed with Pareto Law or lognormal in the most two important industries in Iran as a developing country.

3. FSD: Basic Definitions and Properties

Although distributions like Yule, Zipf and Generelized beta distribution of the second kind (GB2)[1] can be used for explaining FSD, but as mentioned in Section 2, lognormal and Pareto distributions are the two foremost candidate distributions of firm size which will be reviewed in this part. For the purpose of reviewing these two distributions, a non-negative random variable X has a lognormal distribution if the random variable $Y = \ln X$ has a normal distribution. Recall that the normal distribution Y is given by the density function

$$f\left(y\right)=\frac{1}{\sqrt{2\pi}\sigma}e^{-(y-\mu)^2/2\sigma^2} \qquad (1)$$

where μ is the mean, σ is the standard deviation, and the range is $-\infty < y < \infty$. The density function for a lognormal distribution therefore satisfies

$$f\left(x\right)=\frac{1}{x\sqrt{2\pi}\sigma}\exp\left\{-\frac{1}{2\sigma^2}\left(\log x-\mu^2\right)\right\}. \qquad (2)$$

On a logarithmic scale, μ and σ can be called the location parameter and the scale parameter, respectively (Mitzenmacher, 2003).

The lognormal distribution is skewed, with mean $e^{\mu+\frac{1}{2}\sigma^2}$, median e^{μ}, and mode $e^{\mu-\sigma^2}$. If X has a lognormal distribution, then in a log-log plot of cumulative distribution function or the density function, the behavior will appear to be nearly a straight line for a large portion of the body of the distribution. Indeed, if the variance of the corresponding normal distribution is large, the distribution may appear linear on a log-log plot for several orders of magnitude (Limpert et al., 2001).

In regards to Pareto distribution, a random variable X is said to have a Power Law distribution if

$$\Pr\left[X \geq x\right] \sim cx^{-\alpha} \qquad (3)$$

for constants $c > 0$ and $\alpha > 0$. One specific commonly used Power Law distribution is the Pareto distribution, which satisfies

$$\Pr\left[X \geq x\right]=\left(\frac{x}{\beta}\right)^{-\alpha} \qquad (4)$$

[1]For further studies refer to Simon and Bonini (1958), Axtell (2001) and Cirillo (2010).

for some $\alpha > 0$ and $\beta > 0$. The Pareto distribution requires $X \geq \beta$. When plotted in a log-log plot, the distribution is represented by a straight line. The density function for the Pareto distribution is $f\left(x\right) = \alpha\beta^{\alpha}x^{-\alpha-1}$.

The Pareto distribution is characterized by a scale parameter β and a shape parameter α, which is known as the tail index (Mitzenmacher, 2003).

As can be explained, most of the literature in this field of research has been used the lognormal and Pareto distribution to evaluate and compare the firm size distribution. Hence, this paper uses these two distributions for investigating firm size distribution.

4. Estimation Method

4.1. Maximum Likelihood Estimation (MLE)

In statistics, maximum-likelihood estimation (MLE here after) is a method of estimating the parameters of a statistical model. When applied to a data set and given a statistical model, MLE provides estimates for the model's parameters. In general, for a fixed set of data and underlying statistical model, the method of maximum likelihood selects the set of values of the model parameters that maximizes the likelihood function. Intuitively, this maximizes the agreement of the selected model with the observed data, and for discrete random variables, it indeed maximizes the probability of the observed data under the resulting distribution.

Nevertheless, for determining the maximum likelihood estimators of the lognormal distribution parameters μ and σ, we observe that:

$$f_L\left(x;\mu,\sigma\right) = \prod_{i=1}^{n}\left(\frac{1}{x_i}\right) f_N\left(\ln x;\mu,\sigma\right) \qquad (5)$$

where by f_L we denote the probability density function of the log-normal distribution and by f_N that of the normal distribution. Therefore, the log-likelihood function is:

$$\begin{aligned} \ell_L\left(\mu,\sigma \middle| x_1,x_2,...,x_n\right) &= -\sum_{k}\ln x_k + \ell_N\left(\mu,\sigma \middle| \ln x_1, \ln x_2,...,\ln x_n\right) \\ &= constant + \ell_N\left(\mu,\sigma \middle| \ln x_1, \ln x_2,...,\ln x_n\right) \end{aligned} \qquad (6)$$

Thus, the maximum likelihood estimators for the parameters of the lognormal distribution are:

$$\hat{\mu} = \frac{\sum_k \ln x_k}{n} \tag{7}$$

and

$$\hat{\sigma}^2 = \frac{\sum_k \left(\ln x_k - \hat{\mu}\right)^2}{n}. \tag{8}$$

The likelihood for a sample from a Pareto distribution is

$$L = \prod_{j=1}^{n} \frac{\alpha x_0^{\alpha}}{x_j^{\alpha+1}}. \tag{9}$$

This yields the MLE of α

$$\hat{\alpha} = n\left[\sum_{j=1}^{n} \log\left(\frac{X_j}{\hat{x}_0}\right)\right]^{-1}. \tag{10}$$

4.2. Goodness-of-fit test

The goodness of fit of a statistical model describes how well it fits a set of observations. Measures of goodness of fit typically summarize the discrepancy between observed values and the values expected under the model in question. In assessing whether a given distribution is suited to a data-set, Kolmogrov-Smirnov test is used in this paper. The KS statistics for a given cumulative distribution function $F(X)$ is:

$$D_n = \underset{x}{Sup}\left|F_n(X) - F(X)\right| \tag{11}$$

where $F_n(X) = \frac{1}{n}\sum_{i=1}^{n} I_{X_i < x}$ is the empirical cumulative distribution function. The null hypothesis that the sample comes from $F(X)$ is rejected at level of α for $\sqrt{n}D_n > K_\alpha$ is obtained from $\Pr(K \le K_\alpha) = 1 - \alpha$, according to the Kolmogrov distribution.

5. Data and empirical findings

For investigating the FSD in terms of industry, this study uses food & beverages (code 15) and the non-metallic mineral products (code 26) industries, as they are the most important industries in Iran. As shown on Table (1), these two industries, in total, contain 37 percent of firms, 26 percent of employees, 24 percent of output value and also 27 percent of value added among 23 industries in Iran. These statistics is a testament to the importance of these two industries among other manufacturing industries.

Table 1. Percentage of firms, employees, output value and value added in the food & beverages and the non-metallic mineral products industries; 2005

Industry	Firm	Employees	Output Value	Value Added
Food & beverages	18.6	11.9	14	11.3
Non-metallic mineral products	18	14.4	9.6	15.8
Total	36.6	26.3	23.6	27.1

Source: Statistical Center of Iran

In this paper, we use the variable of number of employees as a measure of firm size for analyzing the FSD. In addition, this study includes entrance firms in 1997 which has been followed until 2005[1].

Table (2) reports some descriptive statistics of the employees according to these two industries. As shown on this table, examining of the quartiles indicates a shifting to the right of distribution, regardless of the type of industry. Also, further inspection shows the increase in the mean and standard deviation and a reduction in skewness and kurtosis from 1997 to 2005. Despite the increment of mean and standard deviation, the coefficient of variation reduces which is a representation of tendency towards more homogeneity.

Table 2: Summary statistic of employees of manufacturing firms in 1997 and 2005

	Food & beverages		Non-metallic mineral products	
	1997	2005	1997	2005
Min	10	10	10	10
Median	14	27	16	24
Max	490	448	1191	796
Mean	39.9	54.9	40	68.6
Sd	66.5	70.9	100.1	122.9
Sk.	4.4	2.8	7.6	3.5
Kurt.	21.2	8.8	70.7	13.8
CV	1.7	1.3	2.5	1.8
Employees	9696	7698	15488	9293
firms	243	142	387	138

For inspecting deviation from normal distribution, Figs (1) and (2) report the q-q plot of normal distribution in 2005 for both industries. These

[1]The data at firm level is only available for 1996 to 2005.

graphs describe the widespread heterogeneity across firms in the final year of the period, which produce a skewed distribution.

Fig.1: Food products and beverages industry;2005

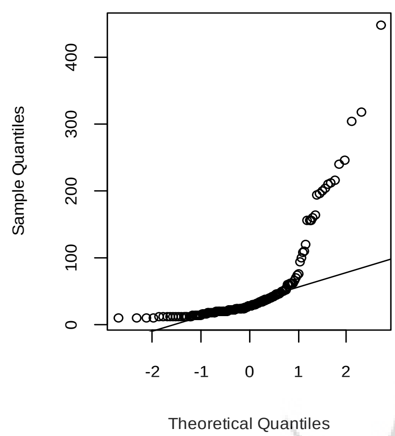
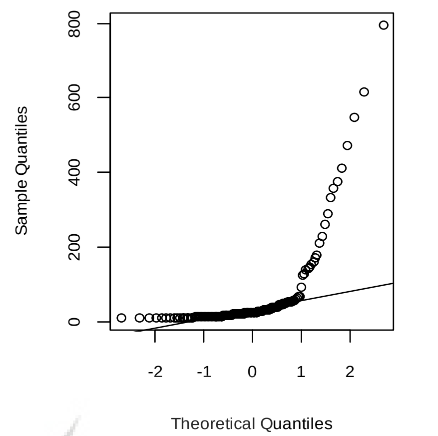


Fig.2: Non-metallic mineral products industry;2005



Additionally, the evolution of the FSD for the starting and final distributions of each industry is shown on Figs (3) and (4). As observed on these figures, the FSD changes to the right as time passes. Overall, it can be stated that FSD is highly skewed and tends to reduce over time. Nevertheless, our results indicate similarity of the evolution of FSDs, regardless of the type of industry which is considered.

Fig.3: Food products and beverages industry

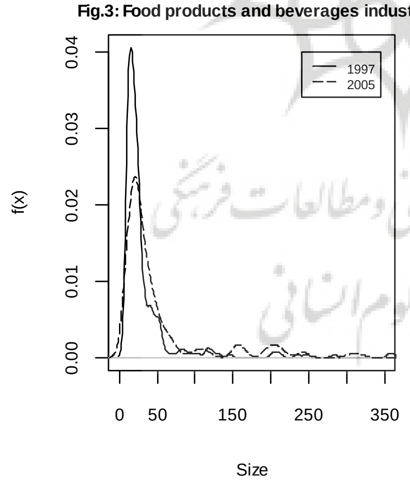
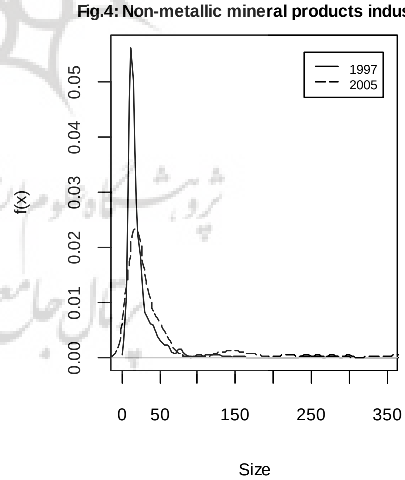


Fig.4: Non-metallic mineral products industry



With respect to the statistical analysis of firm size distribution, equations (7), (8) and (10) were estimated for 1997-2005. In other words, we want to assess what kind of distribution, lognormal or Pareto, is appropriate for representing the FSD in these industries. Therefore, Tables (3) and (4) show estimation of lognormal and Pareto Law along with the goodness-of-fit test.

According to Table (3) which is corresponded to the food & beverages industry, and with inspection of Kolmogorov-Smirnov statistics, the FSD in this industry follows a lognormal distribution, especially after two years of entering. As a matter of fact, the Kolmogorov-Smirnov statistics do not reject the hypothesis of a lognormal distribution at five percent level inversely to the Pareto distribution.

Table 3: Estimation of lognormal and Pareto distribution in the food & beverages industry

	Lognormal distribution				Pareto distribution			
	$\hat{\sigma}$	$\hat{\mu}$	KS	P-value	$\hat{\alpha}$	$\hat{\beta}$	KS	P-value
1997	0.79	3.21	0.15	0	1.11	10	0.09	0.01
1998	0.81	3.18	0.13	0.02	1.14	10	0.09	0.03
1999	0.83	3.33	0.11	0.07*	0.97	10	0.13	0
2000	0.85	3.36	0.09	0.21*	0.95	10	0.12	0
2001	0.85	3.38	0.1	0.14*	0.93	10	0.11	0.02
2002	0.85	3.39	0.09	0.32*	0.93	10	0.13	0.02
2003	0.87	3.46	0.08	0.51*	0.86	10	0.15	0
2004	0.89	3.49	0.11	0.31*	0.83	10	0.17	0
2005	0.88	3.52	0.1	0.35*	0.82	10	0.17	0

*Significant at 5 percent level

Does the FSD in the non-metallic mineral products industries follows a lognormal distribution, as the case of food & beverages industry or Pareto distribution is more appropriate for this industry? To address this question, Table (4) reports the estimation of these two distributions. Conversely to the other industry, in this case, the P-value of lognormal distribution for the entire period is rejected at five percent level, nevertheless the Pareto distribution is a good fit to the empirical one for the last four years.

The probability density functions of both industries in the starting and final year of the period along with the lognormal and Pareto distributions are drawn in Figs (5) and (6). In fact these graphs show the agreement of the empirical distributions with the theoretical ones.

Overall, the results show that whether the FSD follows what kind of distribution varies from industry by industry. It means that policies should be different from each industry due to their various behaviors.

Table 4: Estimation of lognormal and Pareto distribution in the Non-metallic mineral products industry

	Lognormal distribution				Pareto distribution			
	$\hat{\sigma}$	$\hat{\mu}$	KS	P-value	$\hat{\alpha}$	$\hat{\beta}$	KS	P-value
1997	0.84	3.05	0.18	0	1.34	10	0.12	0
1998	0.83	2.93	0.23	0	1.58	10	0.14	0
1999	0.89	3.17	0.16	0	1.15	10	0.12	0
2000	0.94	3.25	0.15	0	1.05	10	0.09	0.02
2001	0.95	3.25	0.14	0	0.98	10	0.1	0.03
2002	0.97	3.37	0.15	0	0.93	10	0.08	0.12*
2003	0.98	3.47	0.11	0.02	0.85	10	0.09	0.11*
2004	1.01	3.47	0.16	0	0.85	10	0.11	0.06*
2005	1.04	3.48	0.14	0	0.84	10	0.09	0.12*

*Significant at 5 percent level

6. Conclusion

Previous researches have determined that FSD as a whole follows as a lognormal and Pareto distributions. In this regards, this paper using the variable employees as a firm size tried to examine the shape of the distribution on the two import industries, food & beverages and non-metallic mineral products. The results show that distribution is different for these industries, so that the food & beverages industry follows lognormal and in contrast the distribution of the non-metallic mineral products industry is a good representation of Pareto distribution. Therefore, there is no universality of the size distribution of firms between industries. From the policy perspective, knowing the FSD can affect on the new entrance decision and improve their performance.

Fig. 5: Fitting the lognormal and Pareto distributions on empirical one in the food & beverages industry

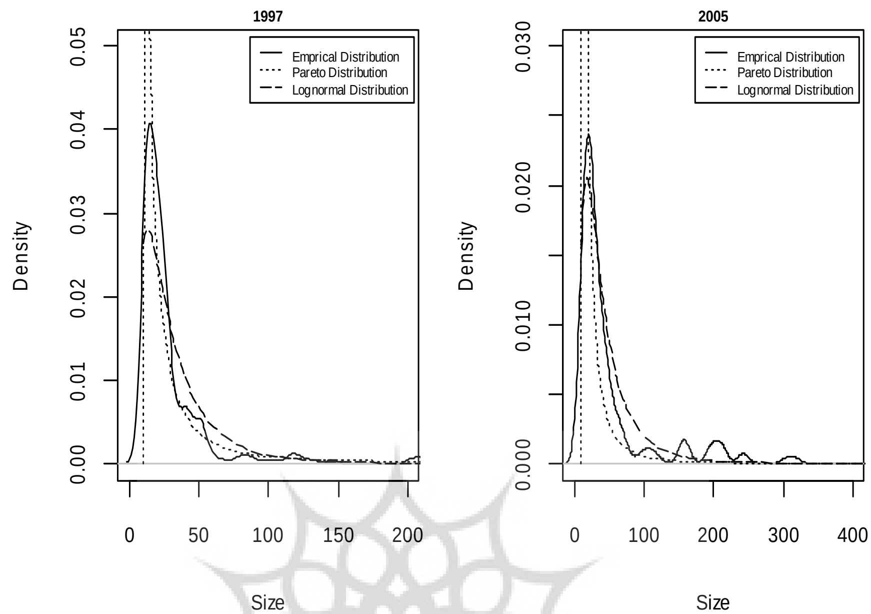
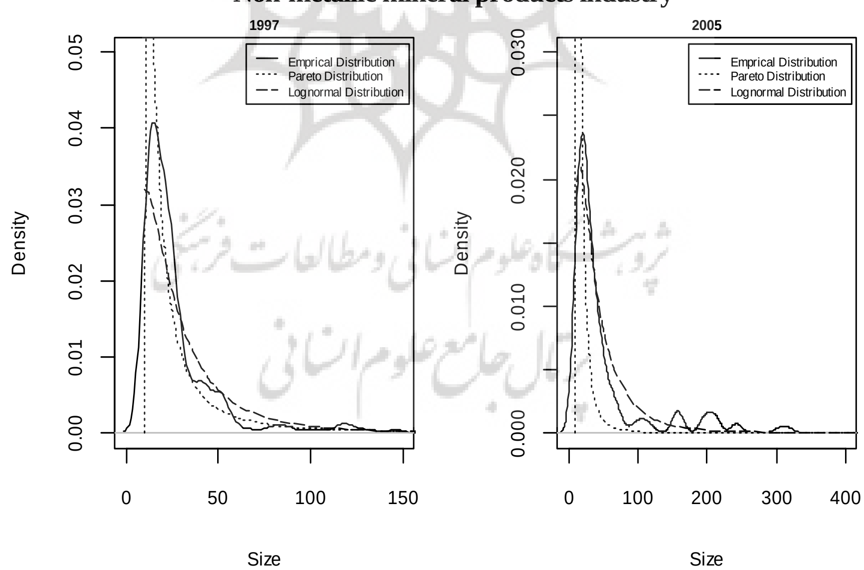


Fig. 6: Fitting the lognormal and Pareto distributions on empirical one in the Non-metallic mineral products industry



Refrences

1. Audretsch, D.B., Klomp, L. and Thurik, A.R. (2004), “Gibrat’s Law: Are the Services Different?”, Review of Industrial Organization, Vol. 24, 3001–3324.
2. Axtell, R.L. (2001), “Zipf Distribution of Us Firm Sizes”, Science, Vol. 293, 1818-1820.
3. Bottazzi, G., Cefis, E. and Dosi, G. (2002), “Corporate Growth and Industrial Structure: Some Evidence from the Italian Manufacturing Industry”, Ind Corp Change, Vol. 11, No. 4, 705–725.
4. Cabral, L. and Mata, J. (2003), “On the Evolution of Firm Size Distribution: Facts and Theory”, American Economic Review, Vol. 93, 1075–1990.
5. Cefis, E., Marsili, O. and Schenk, H. (2009), “The Effects of Mergers and Acquisitions on the Firm Size Distribution”, Journal of Evolutionary Economics, Vol. 19, 1-20.
6. Cirillo, P. and Hüsler, J. (2009), “On the Upper Tail of Italian Firms’ Size Distribution”, Physica A, Vol. 388, 1546–1554.
7. Cirillo, P. (2010), “An Analysis of the Size Distribution of Italian Firms by Age”, Physica A, Vol. 389, 459-466.
8. Gaffeo, E., Gallegati, M. and Palestrini, A. (2003), “On the Size Distribution of Firms: Additional Evidence from the G7 Countries”, Physica A, Vol. 324, 117-123.
9. Geroski, P., Lazarova, S., Urga, G. and Walters, C. (2003), “Are Differences in Firm Size Transitory or Permanent?”, Journal of Applied Econometrics, Vol. 18, No. 1, 47–59.
10. Gibrat, R. (1931), “Les Inegalities Economiques”, Paris: Sirey.
11. Hall, B.H. (1987), “The Relationship Between Firm Size and Firm Growth in the United States Manufacturing Sector”, Journal of Industrial Economics, Vol. 35, 583–606.
12. Hart, P.E. and Prais, S.J. (1956), “The Analysis of Business Concentration: A Statistical Approach”, Journal of the Royal Statistical Society, Vol. 119, 150–191.
13. Jovanovich, B. (1982), “Selection and the Evolution of Industry”, Econometrica, Vol. 50, 649-670.
14. Kaizoji, T., Iyetomi, H. and Ikeda, Y. (2006), “Re-examination of the Size Distribution of Firms”, Evolutionary and Institutional Economics Review, Vol. 2, 183–198.

15. Lipczinsky, J., Wilson, J. and Goddard, J. (2005), “Industrial Organization: Competition, Strategy, Policy (2nd ed.). New York: FT Prentice Hall.

16.Lotti, F., Santarelli, E. and Vivarelli, M. (2009), “Defending Gibrat’s Law As a Long-Run Regularity”, Small Business Economics, Vol. 32, No. 1, 31–44.

17.Oliveira, B. and Fortunato, A. (2008), “The Dynamics of the Growth of Firms: Evidence from the Services Sector”, Empirica, Vol. 35, No. 3, 293–312.

18. Reichstein, T. and Jensen, M.B. (2005), “Firm Size and Firm Growth Rate Distribution-The Case of Denmark”, Industrial and Corporate Change, Vol. 14, 1145-1166.

19. Simon, H. and Bonini, C.P. (1958), “The Size Distribution of Business Firms”, American Economic Review, Vol. 48, 607–617.

20. Sutton, J. (1997), “Gibrat’s Legacy”, Journal of Economic Literature, Vol. 35, 40–59.

21.Zhang, J., Chen, Q. and Wang, Y. (2009), “Zipf Distribution in Top Chinese Firms and an Economic Explanation”, Physica A, Nol. 388, 2020-2024.

22. Kang, S.H., Jiang, Z., Cheong, C. and Yoon, S. (2011), “Changes of Firm Size Distribution: The Case of Korea”, Physica A, Vol. 390, 319-327.

23. Limpert, E., Stahel, W. and Abbt, M. (2001), “Log-normal Distributions across the Sciences: Keys and Clues, BioScience, Vol. 51, No. 5, 341–352.

24. Lee, Y.H. and Hsu, C.H. (2014), “Business Size Extension and Zipf’s Law: The Case of Top Corporate Groups in Taiwan”, International Journal of Business and Management; Vol. 9, No. 4; 124-130.

25. Bhalla, M. and Mukherji, A. (2010), “Firm Size Distribution of Indian Medium, Small and Micro Enterprises”, Indian Institute of Management Bangalore, Working paper, No. 310, July 2010.

26. Mitzenmacher, M. (2003), “A Brief History of Generative Models for Power Law and Lognormal Distributions”, Internet Mathematics, Vol. 1, No. 2, 226-251.

27. Feizpour, M.A., Ahmadi, Z. and Emami Meibodi, M. (2014), “Firm Size Distribution and its Changes Trend in Textile Manufacturing New Firms Using Non-Parametric Technique: 1997-2005”, The Economic Research, Vol. 13, No. 4, 103-126.

28. Schaper, M.T., Dana, L.P. and Anderson, R.B. (2008), “Distribution of Firms by Size: Observations and Evidence from Selected Countries”, Int. J. Entrepreneurship and Innovation Management, Vol. 8, No. 6, 718-726.