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## **ECONOMIC SUCCESS AND SUSTAINABILITY IN PHARMACEUTICAL SECTOR: A CASE OF INDIAN SMEs**

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**Abstract.** Our paper examines one of the key aspects of the organizational economics – the factors of economic success and sustainability of the pharmaceutical small and medium enterprises (SMEs) in India. Indian pharmaceutical industry is known for its high fragmentation and weak generic based R&D initiatives. The study uses inflation adjusted cross section data for 20 SMEs in the year 2013-2014 and applies OLS regression model with robust standard errors. It has found that exports, R&D expenditure, and previous year profits have exercised positive impact on SMEs' growth. The negative, yet statistically significant influence of advertising and marketing expenditure highlights the need to rethink about strategic management policies of SMEs. Our results suggest that SMEs are required to pay more attention towards the global market expansion and value creation through R&D investment, as a part of their long-term growth and survival strategy.

**Keywords:** economic success, sustainability, pharmaceutical industry, economic growth, R&D

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### **1. Introduction**

Organizational economics is distinguished by its special focus on the structure, interaction, operation and implication of organizations (that are distinguished here from the institutions (which become the subject of the

analysis attributed to the institutional economics) and are typically represented by firms – micro-enterprises, small and medium enterprises, or large enterprises (or even multinational corporations) alike), as well as its interest in drawing a link between competition and organization (Argyres et al., 2016). With regard to the above (and within the provided context), understanding the factors that lead to growth of firms (micro, small or large) becomes a very challenging endeavour that represents one of the key issues of organizational economics. However, it is not always that simple to conduct such an analysis since the data on many firms is unavailable and is very expensive to obtain.

Our research focuses on the factors of growth of the pharmaceutical small and medium enterprises using a sample of Indian pharmaceutical firms. Indian pharmaceutical industry is a knowledge intensive industry and majorly focuses upon export revenue generation from generic drugs manufacturing. It is globally ranked third largest industry in volume and thirteenth largest in value of pharmaceutical products (Annual Report, Department of Pharmaceuticals, Ministry of Chemistry and Fertilizers 2009-10). This industry is highly fragmented in nature and there were 10,563 pharmaceutical manufacturing units in India, comprising 8174 formulations and 2389 bulk drugs based units as per first Pharmaceutical Manufacturing Census of India in 2011 (Government of India, 2012). Though this industry is led by large firms but small and medium enterprises (SMEs) are also performing very well. It would be pertinent to explore which factors contribute in growth of SMEs in the Indian pharmaceutical sector.

Against this backdrop, the key objective of this paper is to analyze the determinants of growth in the Indian pharmaceutical SMEs for recent time period i.e., 2013-2014. The Indian pharmaceutical industry has been chosen as a subject of this research due to its peculiarity and uniqueness with regard to its development under the process patent regime introduced in 1970. Following the patent regime introduction, Indian SMEs successfully and creatively “copied” patented innovative products of foreign multinationals making them cheaper and more affordable to the less wealthy Third World customers (Mazumdar and Rajeev, 2009). This gives us enough material for studying the organizational economics and the growth and development aspect of small business enterprises represented here by the Indian small and medium enterprises (SMEs) in the pharmaceutical sector. The Indian flourishing pharmaceutical industry and the SMEs that prospered using the installed regime met the harsh reality when, following the intellectual property rights debate and signing the WTO agreement, India amended the Patent Act of 1970 for the first time in 1995 and then again in 2005.

Jane Bower and Sulej (2007) as well as Kumar et al. (2004) point out that following the changes related to international patents, SMEs in the Indian pharmaceutical industry had to seek for the new strategies in managing the business organization, some of them being American-inspired. Pradhan (2008) describes that evolution pointing out that the increasing number of Indian Transnational Corporations (ITNCs) during that turmoil experienced fundamental changes in the nature and scope of the investments, expansion into the new industries and sectors, as well as the emergence of India as an important region for trans-border activity. Chaturvedi and Chataway (2006) show that Indian firms did not fall into despair but managed to come up with many innovative ideas related to their management solutions and the structure of the organizational scheme and functioning. All the above makes them a promising subject for the research.

The rest of the paper is organized as follows: Section 2 provides a literature review. Section 3 encompasses description of databases and discussion on conceptual framework. Section 4 elaborates on the applied methodology. Section 5 focuses on results and discussion, while Section 6 sums up findings of the study and comes up with the discussion of main results and implications for organizational economics.

## 2. Literature review

The last quarter of the 20<sup>th</sup> century showed that SMEs are not subjects deemed merely to exist on the peripheries of the modern economy. On the contrary, there are lots of issues which large enterprises cannot deal with (Ehrenberger et al., 2015). The position of SMEs has grown steadily and the number of SME employees has increased tremendously. Today, the SME sector has expanded, with small and micro-firms operating in both traditional and newly emerging sectors. SMEs use the most advanced technologies and bring innovations to the market. Quite often, they attract perspective labour force to the potential labour markets (Glazar and Strielkowski, 2010; Janda et al., 2013; Strielkowski and Weyskrabova, 2014; Strielkowski et al., 2016; Jankelová et al., 2017). Recent technological changes from the second half of the 1970s are sometimes called the “Second Industrial Divide,” and can undoubtedly be compared to the Great Industrial Revolution (Lapinskienė et al., 2014; Fornahl et al., 2015; Chamberlin, 2015). Certainly, the most important innovations were those within the ICT (Information and Communication Technologies) sector or energy sector (see for example Naisbitt, 1995; Jovanovic, 2001; Lisin and Strielkowski, 2014; Štreimikienė et al., 2014; Tvaronavičienė et al. 2015; Lisin et al., 2016; Zielińska, 2016; Tvaronavičienė, 2016; Strielkowski et al., 2017; Zemlickiene et al., 2017; Tvaronavičienė, 2017). Thanks to these developments, SMEs were able to break through some of the largest barriers to their development and competitiveness (Strielkowski, 2012).

Consequently, they increased their access to information, to geographically remote markets, and to financial resources. Additionally, they appeared to being capable of decreasing portions of their transaction costs, improving managerial techniques, and decreasing promotional costs. Of course, this is not an extensive list of the effects brought about by the ICT sector alone. Some of the innovations emerged from large enterprises; however, those innovations could not give them the same advantage over the SMEs that they had before. The development of ICT is so dynamic that it appears difficult to describe not only its economic effects, but also its directions. Innovations often appear in startling moments and under unexpected circumstances. The access to information of firms and individuals becomes cheaper and easier. Their future impact on business cannot be described in detail. As a result, an SME might as well own the same technologies and know-how as the large firms and be able to use them more effectively (Naisbitt, 1995).

Information and telecommunication technologies influence all spheres of the economy, from the production of goods to services. Banking, the exchange of information, mass media, consulting and education – all these can offer new services since ICT’s appearance (for instance eBusiness). The revolutionary nature of the ICT sector’s changes was not just a result of its influence on economic processes but was also due to its quick expansion into other, newer sectors. Less-developed countries were getting access to new technologies faster and easier than before. ICT development is global by nature, and this partly accounts for the rebirth of the SME sector all around the world. A specific example of technological progress can be seen in the food- and raw material-processing industry, which used to be the domain of large firms because of the sheer scale of the economics involved. It was in this industry that the first signs of new trends and technological development emerged. This was connected to the digitally run machines which were introduced as early as 1952. The process of substituting mechanical machines with electronic devices had begun. Electronically operated machines were suitable for producing short series and could be easily re-programmed in order to perform different tasks.

However, the processes described above did not stop the effect of the economies of scale. Large enterprises still were the first to implement new labor-saving technologies. As a result, large enterprises were surpassing SMEs in dynamics and labor productivity. The processing industry is the best example of that progression: its share in the overall employment decreased over the last decades mainly due to the reduction in the number of workplaces in large corporations. An increase in supply caused by a rise in labor productivity would be sufficient to satisfy the

escalating demand (which is still on the rise due to the growing incomes). This increase in employment in the sector is no longer a pre-requisite for that. Apart from that, the need to reduce costs forced large enterprises to attempt to improve their economic effectiveness. In order to be able to free the entrepreneurial abilities of their employees, most of those enterprises had to decentralize and de-bureaucratize their structures. These attempts took different shapes, from decentralizing decision-making within the hierarchical structures, to dividing a firm into independent units within the same ownership structure, to giving up certain types of economic activities (Carree, 2002; Białowas, 2016). Within the context of large firms' changes, this ceding of certain types of economic activities was important. Diminishing large enterprises through subcontracting, franchising, outsourcing and the creation of spin-offs led to the appearance of small (dependent or independent) enterprises on the market. The decisive motive for employment reduction in large enterprises was the existence of high labor costs. The protection of employees' rights, guaranteed by the unions, was also lower or nonexistent in the SME sector.

The decreasing employment rates in large enterprises led to the loss of many jobs and the inevitable threat of widespread unemployment. The role of the push factor – establishing a private business – was growing. Surely, such small businesses were very well-known for their high death rate; however, they could considerably increase the population of micro-enterprises (Storey, 1994). The changes in the ways that technological progress has helped SMEs are hard to fully explain. Storey (1994) tried to explain them basing his reasoning of Kondratiev's theory of long waves (Storey, 1994). Namely, he suggested that the new cycle that started in the 1990s could be characterized by new technologies and new spheres of business activity, which would be developed and exploited by the SMEs. As a result, the importance of small firms would grow. However, with the passing of time, some of yesterday's SMEs would have become today's large enterprises, and the other part of small enterprises would have been absorbed by (or fused with) large firms. Large enterprises would have gradually gained control over the economy, so the rebirth of the SME sector would be, according to Storey, a temporary thing (Storey, 1994).

Economic growth nowadays does not depend on an increase in employment. However, the creation of new workplaces still remains at the center of attention for economists, politicians and the general public. Technical progress today has clear labor-saving characteristics, with labor productivity at quite high levels and increasing even more. Therefore, it is no longer necessary to increase the number of workplaces to meet the market's demand for products. Consequently, many developed Western economies face constant and relatively high unemployment. Of course, unemployment does not have exclusively a technological nature. Its short-term determinants might be quite different; however, a constant influence of this technical progress is apparent. The war on unemployment at the turn of the new century is becoming a growing priority of economic policies in the majority of the highly-developed and developed world economies. The same target is being pursued by the less-developed economies, although their determinants of unemployment are quite different (Strielkowski and Čábelková, 2015; Bordea and Pelligrini, 2016; Bordea et al., 2017).

As long as the creation of workplaces is in the interest of every human society, there should be some person, entity or organization that will have the task of creating them. SMEs are being looked at as one of the most important channels of reducing the threat of unemployment through the creation of workplaces. For many years, technical progress was generated in large enterprises, which produced goods on a large scale. Labor productivity grew very fast and the number of workplaces in the large economic organizations increased accordingly. Empirical verification from the 1990s confirms that the dynamics of employment are negatively correlated with the size of an enterprise. Employment increases in small enterprises, and especially in micro-enterprises. This means breaking "Gibrat's Law," according to which the growth (in per cent) of the firm does not depend on its initial.

In neoclassical and industrial economic theory, the main goal of the enterprise is to maximize profits or minimize costs (so-called "duality theory"). According to neoclassical and industrial economics, the most successful

enterprise will be the one with the highest profits. Moreover, profits and costs are easily quantifiable factors that can be relatively easily measured. Therefore, it is not difficult to define an enterprise's "growth" using the neoclassical approach. However, enterprises in the real world may have goals other than maximizing their profits and minimizing their costs. Therefore, their measures of "success" might be not easy to put into quantifiable (or objective) terms. For instance, one can see that in small enterprises, financial performance and success is not the same thing (Kotey and Meredith 1997). The entrepreneurship route to growth and success is not just creative, but also opportunity-driven. According to Du et al. (2013), enterprise growth and success cannot just be explained by a single definition but is a rather complex and holistic fit and balance of several factors.

Some authors define firm's "success" as its ability to survive on the market for a period of at least two to three years (Carter et al. 1997; Boden and Nucci 2000). Therefore, a "successful" entrepreneur as an individual who started a business, built it up where no previous business had been functioning, and continued for a period of at least five years to the present profit-making structure. Other studies on the personality of entrepreneurs (Gatewood et al., 1995) defined "success" more in financial terms, linking the most common characteristics found among entrepreneurs to measures like return on investment, growth in sales, and yearly profit, or to the personal income of the owner/manager of the business. Furthermore, according to Driessen and Zwart (2006), three main characteristics of firm's growth and success can be deduced, followed by five secondary ones: (i) the need for achievement, (ii) an internal locus of control and (iii) a risk-taking propensity. The secondary characteristics include: (i) the need for autonomy, (ii) the need for power, (iii) a tolerance of ambiguity, (iv) the need for affiliation, and (v) endurance.

All in all, measuring and determining growth (and success) of a firm is not an easy task. Good data is required in order to conduct a comprehensive analysis and to deduce the factors determining the growth and success of a business firm. In general, it appears that the two groups of factors (those internal to the firm and external to the firm) can be outlined and employed for such an analysis. In addition, factors that could potentially have some positive impact on enterprise growth and success can also be used. In the section that follows we will present our conceptual framework that would enable us to determine the factors of growth of our chosen sample of business entities.

### 3. Conceptual framework

Our study employs real financial data from the audited annual financial statements for Indian pharmaceutical industry for the year 2013-14. The study uses cross section data of 20 SMEs listed in Prowess Database of Center for Monitoring Indian Economy (CMIE). According to the Marginal and Small Manufacturing Enterprises act of 2006 Indian manufacturing sector SMEs are defined as follows (Table 1):

**Table 1.** Manufacturing Enterprises – Investment in Plant & Machinery

Description	in INR	in USD(\$)
Micro Enterprises	Up to Rs. 25 Lakh	Up to \$ 62,500
Small Enterprises	above Rs. 25 Lakh & up to Rs. 5 Crore	above \$ 62,500 & up to \$ 1.25 million
Medium Enterprises	above Rs. 5 Crore & up to Rs. 10 Crore	above \$ 1.25 million & up to \$ 2.5 million

*Source: MSMED (2006)*

The SMEs that are subject of our research are considered on the above-mentioned basis. The subject of the exploration of determinants of growth is of greater research interest because such research studies may help policy makers to recommend and implement public or company specific policies that may stimulate and

maximize growth among the SMEs in this competitive industry. The dependent variable in our study is the growth rate of SMEs. This measure is an indicator of how much potential these SMEs carry. Total assets, sales and employment are the most widely used variable for measuring firm level growth. Various studies namely, Loi and Khan, (2016); O'Regan and Garwe (2006); Hermelo and Vassolo, (2007); and Olwale and Garwe (2010) have taken sales as a measure of growth in their studies. Present study also uses sales growth rate as dependent variable as sales is the most important indicator of growth from the managerial point of view. It is calculated as annual growth rate of total sales for the year 2014 (1):

$$SGR = \frac{\text{sales revenue of 2014} - \text{sales revenue of 2013}}{\text{sales revenue of 2013}} * 100 \quad (1)$$

where SGR is sales growth rate.

Table 2 presents and defines the list of dependent and independent variables that are postulated to be affecting the growth of SMEs in the Indian pharmaceutical sector.

These independent variables are briefly described below:

- **R&D Expenditure:** Existing literature indicates that R&D expenditure affects SME growth in a knowledge intensive industry such as pharmaceuticals. R&D investment is made by SMEs to generate maximum profits and increase sales. R&D investment is a part of long term survival and growth strategies in the Indian pharmaceutical SMEs, so present study also supposes a positive impact of R&D on sales growth.
- **Exports:** Bernard and Jensen (1995), in their seminal paper, analysed the links between exports revenues and productivity. Increased productivity further results in sales growth due to optimal costs.. Thus basing upon a common notion of exporting firms being more profitable and drawing from the prior art, it is hypothesized that export intensity may have positive impact on the profitability.
- **Leverage Ratio:** Extant studies suggest that SMEs faces serious difficulties while borrowing from external sources due to their size. These SMEs generally do not depend upon external finances for increasing their growth rate due to high cost of external debt financing. Previous studies indicate a negative relation between leverage and performance (Athanasoglou et al., 2008; Mohpatra, 2012; and Sun et al., 2013). It is hypothesized that leverage ratio has a negative impact on SMEs' growth.
- **Past Profits:** Past profits are expected to favorably and significantly impact SME's growth rate because with the increase in profits, SMEs can manage to invest in high returns project and thus may increase their growth.

**Advertising and Marketing Expenditure:** It increases level of brand recognition and creates a favorable position for the SMEs. In pharmaceutical industry small firms prefer to advertise locally and they emphasize upon promoting their products among local doctors. These selling techniques help them to grow rapidly. Basing upon prior art, it is hypothesized that advertising and marketing intensity positively impact the profitability.

**Table 2.** Determinants of growth in the Indian Pharmaceutical SMEs

Variables	Symbols	Description
<b>Dependent Variable</b>		
Firm Growth	SGR	Annual growth rate of sales of the firm <sub>i</sub>
<b>Independent Variables</b>		
Research & Development (R&D) Expenditure	RDE	R&D expenditure of the firm <sub>i</sub>
Exports	EXP	Total exports revenue of the firm <sub>i</sub>
Leverage Ratio	LEV	Total debt as a percentage of total equity of the firm <sub>i</sub>
Advertising and Marketing Expenditure	AMI	Advertising and Marketing expenditure of the firm <sub>i</sub>
Profits	PAT	Profit after tax of the firm <sub>i</sub> , lagged for one year

Source: Own results

#### 4. Methodology

In order to examine the determinants of growth, the study uses simple OLS regression with robust standard error to deal with the problems of possible autocorrelation and heteroscedasticity. Descriptive statistics are presented in Table 3.

**Table 3.** Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SGR*	20	7.18	28.64	-92.88	59.38
EXP	20	348.33	538.32	10.00	2043.00
RDE	20	26.57	63.98	0.40	243.80
AMI	20	100.04	156.72	0.00	646.30
LEV	20	0.47	0.53	0.00	1.70
PAT	20	92.14	145.40	-53.80	530.60

Note: \*SGR is shown in % while other variables are measured in million INR.

Source: CMIE Prowess Database (2016)

**Table 4.** Collinearity Diagnostics

Variable	VIF	1/VIF
RDE	6.69	0.15
EXP	5.6	0.18
LEV	1.91	0.52
PAT	1.27	0.79
AMI	1.22	0.81
Mean VIF	3.34	

Source: Own results

Collinearity diagnostics confirmed no multicollinearity among the variables, as depicted in greater detail in Table 4. Our empirical model specifications are as follows (2):

$$SGR = \alpha + \beta_1 RDE + \beta_2 EXP + \beta_3 LEV + \beta_4 PAT + \beta_5 AMI + e \quad (2)$$

where the independent variables are those described above and e is an error term.

## Results and discussions

Estimated coefficients are presented in Table 5. Table 5 shows very small but statistically significant coefficients for EXP, RDE, AMI and PAT.

**Table 5.** Estimated Coefficients of OLS Model

Variables	Coefficient	Robust Std. Err.	P values
EXP	0.02060	0.01143	0.05
RDE	0.00674	0.00251	0.00
AMI	-0.00997	0.00430	0.00
LEV	3.49755	2.87207	0.86
PAT	0.00870	0.00467	0.04
Number of obs		20	
Prob > F		0.04	
R-squared		0.47	
Root MSE		1.61	

*Source:* Own results

These smaller values are due to running the regression on absolute values. LEV shows a higher coefficient value due to ratio measurement but it is in insignificant relationship with SME growth. Exports are positively associated with SGR as consistent with earlier studies. Indian pharmaceutical SMEs also depend upon exports for their growth like their market leaders and knowledge spillover from global market participation helps firm to multiply their sales in the global and domestic markets (Lu & Beamish, 2006). R&D expenditure is significantly and positively associated with firm growth. Indian pharmaceutical industry is a knowledge intensive industry and even SMEs are expected to invest in generics R&D and produce value added products (Simanjutak et al., 2011). AMI depicts a negative yet significant relationship with SME growth, contrary to the extant literature. This negative relationship may imply that SMEs may not gain from the advertising at a point of time due to the high costs of advertising. Results might differ in the long run. Profit after tax is positively and significantly associated with, SGR as expected. Past profits definitely help firms by providing an internal investible fund to invest in R&D, which is more important with reference to SMEs due to their low capability of availing external finances.

## Conclusions

The presented study has found that exports, R&D expenditure, and past profits have exercised positive influence on growth of SMEs. All these determinants are of high importance as they provide very powerful tools to SMEs to increase their growth rate. The negative and statistically significant impact of advertising and marketing expenditure highlights the need to adjust firm level strategies to increase the growth rate. Using the cross-section data is one of the major limitations of the study which can be taken for the future research. The sector of firm (mostly represented by the SMEs) played a dominating role in the creation of new workplaces in the last two decades of the 20<sup>th</sup> century in the economies of the developed nations). It constituted a considerable share of employment on a national economic scale in the majority of countries all over the world. The largest part of this increase happened before the end of the 1990s. Moreover, the gross increase in workplaces is still higher in small firms than in large ones. This comparison only holds true if large and micro firms are compared. In case the net increase of the workplaces for the last several years is taken into account, those differences do not seem quite as apparent. The future research could also focus on some unexplored dimensions. Policy variables may also be



included in such research. Researchers may conduct a panel level study in order to provide interesting insights. Two-way relationships may also be explored between growth rate and R&D expenditure. Our results seem to be important for the field of organizational economics and economics of small and medium companies, both in the pharmaceutical industry and in the other industries that heavily employ R&D and tend to grow and expand in the recent years.

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