

# Impact of the Perpetual Existence of Firms on Profitability: Empirical Evidence from Food Industry in India

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All firms strive to earn high profitability (P) since that is what is expected of firms by the shareholders, creditors, public and other stakeholders. There are many factors that influence P of a firm. Of them, age (AG) which indicates the perpetual existence of the firm in the industry always put it in an advantageous position when compared to the other firms. This study analyses the impact of various variables such as aggressive investment policy (AIP), capital intensity (CAPINS), growth rate (GROW), size (SIZ) and volatility (VOL) on the P controlling for age (AG) with regard to firms in food industry in India. Correlation and multiple regressions are used to study various variables that influence P of a firm for the various age categories. ANCOVA is used to analyze if the controlling variable, AG influences P. The study proves that AG has significant influence on the P of the firms in food industry in India. GROW and SIZ are found to be important determinants of P of new firms encouraging the expansion of the firms in terms of assets and sales, while GROW has a significant impact on P of growing firms. However, SIZ is found to be a good determinant of P in case of established firms.

**Key Words:** Age, food industry, growth rate, profitability, size, and volatility.

## Introduction

The Indian economy is predominantly agrarian. The agriculture sector alone accounted for 14.6% of GDP in 2009-10 as against 57% in the beginning of 1950s. With gradual industrialization the share of agriculture in GDP has declined paving way for secondary and tertiary sectors to flourish. Agriculture sector, which is the livelihood to about 60% of the population, is imperative in India and has a diverse agro-climatic condition and with large diverse raw material base suitable for food processing firms. India is becoming the eastern hub of the food industry, and it is being the world's second largest producer of food next to China has the potential of being the biggest with the food and agricultural sector. And India is the third largest producer of food grain and the second largest producer of fruits and vegetables. With its growing population, India is not only one of the largest producers of food materials but also a large consumer of food. The rising demand for food item and relatively slower supply response from the agricultural sector has led to frequent spikes in food inflation. Further, lack of proper infrastructure facility and proper storage facility also adds fuel to fire.

Although India is one of the world's major food producers it accounts for less than 1.5 per cent of international food trade due to obvious reasons. Lack of proper infrastructural facility has led to a storage loss as high as 30% (The Food Corporation of India), which has added to the food inflation caused due to rising demand and adverse weather, tightening food supplies.

Urgent efforts are needed to expand, improve and modernize storage of food grains in the country in order to minimize the wastage of food grains. The National Advisory Council (NAC) has informed that the government has already finalized a plan for food grain storage that will extend storage capacities to 58 million metric tons in the near future. Development of food industry would be the right alternate for overcoming these setbacks. The development should necessarily be backed by good analysis and study of the financial structure of food industry to help and grow faster and direct the growth of the industry in the right path.

## Conceptual Framework

Profitability (P) is the most spoken of issue in case of all firms. All firms strive to earn high P since that is what is expected of firms from the shareholders, creditors, public and other contributors. There are many factors that influence P of a firm. Of them, age (AG) of the firm is considered to be a crucial determinant of P. Perpetual existence of the firms would help them to understand the market condition, gain experience and efficiency in the production process which may enhance its P (Stinchcombe (1965); Chittenden et al. (1996); Hall et al. (2000); Michaelas et al. (1999)). Therefore, there exists a positive relation between AG and P of the firm. However, new firms adapting latest technology may perform better than that of the established firms. The established firms are more resistant to change in a competitive arena and newer technologies may lead to business failure (Hannan and Freeman, 1989). Hence, the

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variables influencing the P of the firms may vary from firm to firm depending on its continuation in the industry and its experience. This study analyses the variables that influence P controlling for AG with regard to firms of food industry in India.

### **Review of Literature**

Review of past studies in precise brings out different findings about the determinants of P. A considerable number of studies have probed into the relationship between size of firms (SIZ) and P. Large firms may choose to use equity financing as they have little influence on the control of them (Weston and Brigham, 1981). Small firms also fix on to external financing as they face greater information asymmetries and agency problems than that of the large firms (Berger and Udell, 1995, 1998). Small firms are characterized by variability in profits and growth. Increase in P along with increase in SIZ and AG may help them to grow at a faster rate (Storey Collins et al., 1987). Large firms with diverse capabilities, generate superior performance relative to smaller firms (Penrose, 1959; Baumol, 1959). Thus, the firm's size exhibit a positive relationship with profitability (Hall and Weiss, 1967; Berk, 1997; Michaelas et al., 1999; Hall et al., 2000; Cassar and Holmes, 2003; Darko Tipuric, 2002; Leledakis et al., 2004; Vijayakumar and Kathirvel, 2003; and Renu Luthra and Mishra, 2004). On the other hand, Capon et al. (1990), Rajan and Zingales (2000), Goddard Tavakoli and Wilson (2005), Bala Ramasamy et al. (2005), Abdussalam Mahomoud Abu-Tapanjeh (2006), Kuldip Kaur (1998) and Abdul Rahaman Amman (2003) argued for a negative relationship between SIZ and P. On the contrary, Marcus (1969) and Amato & Wilder (1990) proved that the relationship of P may vary according to the SIZ.

Intensive utilization of capital is a vital factor in determining the P of the firm. There are different perceptions about the impact of capital intensity (CAPINS) on P. CAPINS can affect P because cut-throat competition might eliminate all future profits, depressing each firm's security level (Ghemawat et al., 1986). CAPINS can affect profitability because, in incontestable markets, it offers firms the opportunity to make binding commitments of resources (Harris, 1988). Both higher predicted profitability and higher capital requirements raise CAPINS (Harris, 1988). CAPINS imposes a greater degree of risk because assets are frozen in long lived forms that may not be easy to sell. These varied views create interest in studying the impact of CAPINS on P.

Liquidity affects the firm's both P and operating risks (operating leverage) (Papaicannou et al., 1994). Liquidity and P put forth two controversial arguments i.e., whether to maximize the return by aggressive investment, which may have a bearing on the liquidity position of the firm or to dilute returns. The works of Kamath (1989) Deloof (2003), Lazaridis and Tryfonidis

(2006), Eljelly (2004), Raheman and Nasr (2007), Garcia-Teruel and Martinez-Solano (2007), Mathuva (2009), Falope and Ajilore (2009) and Amarjit Gill, Nahum Biger and Neil Mathur (2010) recognized that higher liquidity negatively influences P, whereas Bardia (2004) and Sur et al. (2001) argued on the contrary stating that aggressive investment policy (AIP) and cash-flows irregularity could affect the financing decision as they tend to raise the cost of debt which in turn may affect the P of the firm. This makes it necessary to study the impact of AIP on P of the firms.

Consistent profit earning capacity is also looked into as a determinant of P. Competitive market creates much of such risk. In more competitive market where price cut out were sort for, P gets reduced due to higher cost of debt, thereby the chances of financial distress and bankruptcy also increase (Pandey, 2002). Volatility (VOL) in earnings reduces the P due to financial distress and bankruptcy risk. Growth (GROW) of the firms contributes in increasing the P. GROW, analyzed in most of the studies, is consistently related to higher financial performance. GROW in assets and sales individually show positive relationship to performance at both industry and firm levels (Capon et al., 1990). Hay and Morris (1991), on the other hand have pointed out that the relationship between GROW and P may either be positive or negative. High growth could increase profit margins when investment in additional capacity can be matched with equal demand (Scherer and Ross, 1990). Further, Greiner (1972) also stated that the relationship between GROW and P can either be positive or negative. However, Chan and Zhao (2005) and Elodos Punnoose (2008) claimed for a negative relationship between GROW and P, hence the impact of GROW on P is inconclusive and should therefore be analyzed.

The reviews give precise view about the impact of the various financial variables on P of the firms. To make an in depth study about these variables in the context of food industry in India, the following objectives are set.

### **Materials, Methods and Research Methodology**

#### **Objectives of the Study**

- To study if the age of the firm influences the profitability
- To analyze the impact of aggressive investment policy, capital intensity, growth rate, size and volatility on the profitability of the firms; and
- To analyze the impact of age of the firms in deviating the relationship between the other predictor variables and profitability.

#### **Sampling Design**

The food industry in India comprises 1711 firms as on 24th September 2011. However, the ultimate samples of 60 firms,

which have complete data in the data source for the study period, are selected for the study.

**Methods, Sources of Data and Period of the Study**

The study is based on secondary data, which are collected from Centre for Monitoring Indian Economy (CMIE) Prowess package for a period of 10 years on year to year basis ranging from 2000-2001 to 2009-2010.

**Research Methods for Analysis**

Correlation co-efficient is extensively used to study one-to-one

relationship between the variables within the different age categories. Multiple regressions are also used to study various variables that influence the P of a firm for the various age categories, and appropriate ratios are used to compute individual relative properties of the selected variables. ANCOVA is used to analyze if the controlling variable, AG influence P.

**Ratios Used for the Study**

Description of Ratios Used for the Study		
Variables	Description	Inference
<i>P</i>	PBITD/ Total Assets	It indicates the return on assets invested. High value denotes high return on assets and vice versa
<i>AIP</i>	Current Assets /Total Assets	It indicates the proportion of current assets to total assets. A low value indicates more aggressive use of assets for increasing earnings and vice versa
<i>CAPINS</i>	Total Assets / Sales	It indicates how intensively the assets are used to increase turnover. A low value indicates large turnover for the investment in assets and vice versa
<i>GROW</i>	Compounded annual growth rate (CAGR) of total assets	The growth of total assets over the years
<i>VOL</i>	Standard deviation of earnings before interest, taxes and depreciation (EBITD) / Total Assets	A high value denotes high volatility in earnings from the assets invested and vice versa
<i>SIZ</i>	Logarithm of Sales over Years	Turnover adjusted for fluctuation over the years
<i>AG</i>	Total number of years from the date of incorporation	The number of years the firm has been carrying out business

**Controlling Variable**

The impact of AG on P is analyzed using uni-variate analysis. For the purpose, the sample firms are grouped into three ranges based on their AG from the date of incorporation viz., firms with AG <15 years (new firms), firms with AG >15years but <30 years (growing firms) and firms with AG >30 years (established firms). Dummies are used to represent different ranges of AG.

**Regression equation**

Regression equation is formulated to study the determinants of

P. The term P has been defined by Lowe et al. (1994) as the average rate of return on assets (ROA).

Hence, the equation is:  $P = \text{PBITD} / \text{Total Assets}$

$$P = \alpha + \beta_1 AIP + \beta_2 CAPINS + \beta_3 GROW + \beta_4 VOL + \beta_5 SIZ + \epsilon$$

**Hypotheses Development**

Ho<sup>1</sup> = “There is no significant influence of age on the profitability of the firms”.

Ho<sup>2</sup> = “There is no significant relationship between aggressive

investment policy and profitability of the firms”.

Ho<sup>3</sup> = “There is no significant relationship between capital intensity and profitability of the firms”.

Ho<sup>4</sup> = “There is no significant relationship between volatility and profitability of the firms”.

Ho<sup>5</sup> = “There is no significant relationship between growth and profitability of the firms”.

**Limitations and Scope for Further Studies**

- Analysis of the study is based on financing data collected from secondary source. Therefore, the quality of the study depends purely upon the accuracy, reliability and quality of secondary data.
- The sample is limited to 60 firms, which have complete data

in the data source for the study period.

- The R2 value is very low in case of established firms and the F statistics is also insignificant, indicating that there are other variables that determine the P of established firms leaving scope for further studies considering the other variables for analysis.

**Analysis: Impact of Firms' Age on Profitability**

The ANCOVA result shows that (see table-1) AG has significant positive influence on P (F value 3.424) at 5% level. The firms in food industry in India show that their P increases with the period they are able to survive in the market. GROW, on the other hand has highly significant positive impact with P (F value 15.64) at 1% level. Hence, higher investment in the assets also enables the firms to increase P, which gives a wider scope for development and growth for firms in food industry.

**Table -1 ANCOVA Result Showing the Influence of the explanatory Variables on P**

Variables	F value	'p' value
<i>Intercept</i>	5.224	.026
<i>AIP</i>	0.426	.517
<i>CAPINS</i>	3.9	.054
<i>GROW</i>	15.64**	.000
<i>VOL</i>	0.374	.543
<i>AG</i>	3.424*	.040

Source: Computed results based on compiled data collected from CMIE prowest Pvt. Ltd.

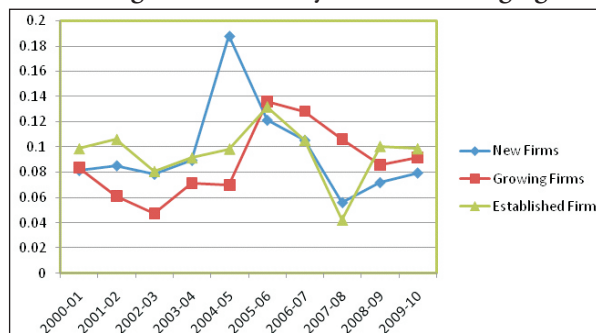
\*\* .Significant at 1 % level; \* .Significant at 5 % level

As the ANCOVA results prove that AG and GROW have significant influence on P, a further analysis has been carried out controlling the AG of the firms to estimate the variables that determine P within each AG category. For the purpose, the firms are categorized as new firms (with AG <15 years), growing firms (with AG >15years but <30 years), and established firms (with AG >30 years).

**Age-wise Analysis of Determinants of P**

The trend lines show that (see figure-1) the P of the new firms has gone to peak in the year 2004-05 but could not maintain it during the period of global meltdown and has plunged in to low during the year 2007-08. Though the established firms are also affected during the same period they have proved that they have the capability for speedy recovery to some extent. However, the growing firms are found to be more stable in maintaining the P even during 2007-09 i.e. during the global meltdown period.

**Figure-1 Trend Line Showing the Profitability of Firms Belonging to Various Age Ranges**



Source: Computed results based on compiled data collected from CMIE prowest Pvt. Ltd

**Determinants of P for New Firms**

The correlation result shows that (see table-2) GROW (.64) and SIZ (.59) have highly significant positive correlation with P at 1% level while CAPINS (-.43) and VOL (-.41) have significant negative correlation with P at 5% level. Thus expansion of business and further investment in assets are encouraged for the new firms. An increase of sales also enhances its P. Intensive use of assets to increase sales enhances P as CAPINS shows a significant negative relation with P. VOL in earnings may not help the firms as they are new to the industry and which would

create distrust among the shareholders as well as among the outside contributors. Thus, P falls with increase in VOL.

The regression (see table-3) doesn't identify any significant determinants of P. However, the R2 (0.51 in model 1 and 0.47 in model 2) indicates that these variables together could explain (determine) over 50%. In model 2, GROW has significant positive coefficient with P at 10% level. The F statistics is also highly significant at 1% level in both the models (4.46 in model 1 and 6.93 in model 2).

**Table-2 Correlation Matrix for Determinants of P for New Firms**

Variables	<i>P</i>	<i>AIP</i>	<i>CAPINS</i>	<i>GROW</i>	<i>VOL</i>	<i>SIZ</i>
<i>P</i>	1					
<i>AIP</i>	.232	1				
	.245					
<i>CAPINS</i>	-.433*	-.109	1			
	.024	.588				
<i>GROW</i>	.642**	.339	-.354	1		
	.000	.083	.070			
<i>VOL</i>	-.413*	-.473*	.157	-.408*	1	
	.032	.013	.434	.035		
<i>SIZ</i>	.598**	.565**	-.499**	.687**	-.398*	1
	.001	.002	.008	.000	.040	

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*.. Correlation is significant at the 0.01 level (2-tailed).

**Table-3 Results of Regression for Determinants of P of New Firms**

Variables	Un-standardized Coefficients Beta Value	
	Dependent variable <i>P</i>	
	Model 1	Model 2
<i>(Constant)</i>	.074 (.092)	.036 (0.226)
<i>AIP</i>	-.058 (.422)	-

<b><i>CAPINS</i></b>	-.001 (.424)	-
<b><i>GROW</i></b>	.165 (.105)	.181 (.072)
<b><i>VOL</i></b>	-.188 (.267)	-.131 (.400)
<b><i>SIZ</i></b>	.022 (.297)	.020 (.223)
<b><i>R<sup>2</sup></i></b>	0.515	0.475
<b><i>Adj-R<sup>2</sup></i></b>	0.400	0.407
<b><i>F Stat</i></b>	4.467** (0.006)	6.936** (.002)

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.  
Note: Figures in parentheses are 'p' values; \*\*.Significant at 1 % level; \*.Significant at 5 % level

#### Determinants of P for Growing Firms

The correlation matrix shows that (see table-4) *GROW* (.67) and *SIZ* (.66) have highly significant positive correlation with *P* at 1% level. Thus, for growing firms, expanding the business in terms of assets and increasing the sales volume increase the *P*. On the other hand, the significant negative relation of *CAPINS* (-

.78) with *P* at 1% level indicates that the assets should be productively used to increase the turnover which would, in turn, ultimately increase the *P*. However, *VOL* doesn't have significant correlation with *P* of growing firms as it is seen in the case of new firms.

Table-4 Correlation Matrix for Determinants of P for Growing Firms

Variables	<i>P</i>	<i>AIP</i>	<i>CAPINS</i>	<i>GROW</i>	<i>VOL</i>	<i>SIZ</i>
<b><i>P</i></b>	1					
<b><i>AIP</i></b>	-.033 .904	1				
<b><i>CAPINS</i></b>	-.781** .000	-.431 .096	1			
<b><i>GROW</i></b>	.676** .004	-.079 .772	-.725** .001	1		
<b><i>VOL</i></b>	-.277 .300	.207 .442	.422 .103	-.661** .005	1	
<b><i>SIZ</i></b>	.667** .005	.231 .389	-.675** .004	.569* .021	-.051 .851	1

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The regression results show that (see table-5) CAPINS (-.02) and AIP (-.15) have highly significant negative coefficient with P at 1% level. While AIP shows the proportion of total asset not used for productive purpose, CAPINS shows the turnover the investment earns in a given period. The significant negative coefficient that these variables have with P shows that aggressive

use of assets for productive purpose facilitates the growing firms. The R<sup>2</sup> is 0.86, which indicates that these explanatory variables determine over 80% of P for growing firms. The F statistics (12.38) is also highly significant, indicating that the changes in the predictor variables influence the P.

Table-5 Results of Regression of Determinants of P of Growing Firms

Variables	Un-standardized Coefficients Beta Value	
	Dependent variable <i>P</i>	
<i>(Constant)</i>	.200	(.001)
<i>AIP</i>	-.159**	(.004)
<i>CAPINS</i>	-.020**	(.001)
<i>GROW</i>	-.023	(.833)
<i>VOL</i>	.406	(.125)
<i>SIZ</i>	.003	(.770)
<i>R<sup>2</sup></i>	.861	
<i>Adj-R<sup>2</sup></i>	.791	
<i>F Stat</i>	12.380**	(.001)

Source: Computed results based on compiled data collected from CMIE prowest Pvt. Ltd.

Note: Figures in parentheses are 'p' values; \*\*.Significant at 1 % level; \*.Significant at 5 % level

Table-6 Correlation Matrix of Determinants of P for Established Firms

Variables	<i>P</i>	<i>AIP</i>	<i>CAPINS</i>	<i>GROW</i>	<i>VOL</i>	<i>SIZ</i>
<i>P</i>	1					
<i>AIP</i>	.417	1				
	.096					
<i>CAPINS</i>	-.452	-.446	1			
	.068	.073				
<i>GROW</i>	.367	-.105	-.349	1		
	.148	.689	.170			
<i>VOL</i>	.065	-.063	-.156	-.150	1	
	.805	.811	.549	.566		
<i>SIZ</i>	.612**	.647**	-.833**	.429	-.010	1
	.009	.005	.000	.086	.969	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## Determinants of P for Established Firms

SIZ (.61) has highly significant positive correlation (see table-6) with P at 1% level in case of established firms. Thus, the increase in turnover is helpful for these firms to increase their P. The other explanatory variables have insignificant correlation with P. The regression results also show that (see table-7) SIZ has

significant positive coefficient (.05 in model 2) with P at 5% level. The R<sup>2</sup> (0.42 in model 1 and 0.39 in model 2) is around 40%, indicating that the predictor variables determine the P to the extent of 40% only. The F statistics is, however, significant at 10% only, indicating that the influence of the predictor variables on P is not highly significant in case of established firms.

Table-7 Results of Regression of Determinants of P of Established Firms

Variables	Un-standardized Coefficients Beta Value	
	Dependent variable P	
	Model 1	Model 2
<i>(Constant)</i>	-.090 (.452)	-.020 (.730)
<i>AIP</i>	.077 (.668)	-
<i>CAPINS</i>	.000 (.645)	-
<i>GROW</i>	.176 (.481)	.110 (.562)
<i>VOL</i>	.337 (.556)	.208 (.681)
<i>SIZ</i>	.052 (.352)	.049* (.038)
<i>R<sup>2</sup></i>	.425	.397
<i>Adj-R<sup>2</sup></i>	.164	.257
<i>F Stat</i>	1.627 (.233)	2.848 (.079)

Source: Computed results based on compiled data collected from CMIE prowest Pvt. Ltd.

Note: Figures in parentheses are 'p' values; \*\*.Significant at 1% level; \*.Significant at 5% level

## Summary of Findings and Discussion

The analysis shows that AG has significant influence on the P of the firms in food industry in India. There exists a positive influence of AG on P, coinciding with the results of Stinchcombe (1965), Chittenden et al. (1996), Hall et al. (2000), and Michaelas et al. (1999). Thus, the hypothesis Ho1 that "there is no significant influence of age on the level of profitability of the firms" is rejected.

However, the correlation and regression carried on to analyze the determinants of P under various AG categories shows different and interesting results. The correlation analysis of new firms shows that GROW and SIZ have highly significant positive correlation with P at 1% level, encouraging the expansion of the firms in terms of assets and sales, which corroborates the findings of Capon et al. (1990). Many researchers, viz., Darko Tipuric (2002), Leledakis et al. (2004), Vijayakumar and Kathirvel (2003), and Renu Luthra and Mishra (2004) pointed out that as the SIZ increases the P also

increases. Thus, the hypothesis Ho5 that "there is no significant relationship between growth and profitability of the firms" is rejected in case of new firms.

VOL has significant negative correlation with P at 5% level, indicating that VOL in earnings could be disastrous to these new firms. This result is against that of the outcome of Ghemawat et al. (1986) and Harris (1988) who argued that intensive utilization of capital reduces P due to increasing risk of assets getting blocked. This fact disproves the findings of Pandey (2002), who stated that increase in VOL decreases P of the firms. Thus, the hypothesis Ho4 that "there is no significant relationship between volatility and profitability of the firms" is rejected.

GROW and SIZ have highly significant positive correlation with P at 1% level for growing firms, emphasizing on the expansion as that of the new firms. This leads to the rejection of the hypothesis Ho5 in case of growing firms. However, VOL is not found to be a significant determinant of P of growing firms.



The regression results show that CAPINS and AIP have highly significant negative coefficient with P, disproving the arguments of Ghemawat et al., 1986. Thus, the hypothesis Ho3 that “there is no significant relationship between capital intensity and profitability of the firms” is rejected, supporting intensive utilization of assets in case of growing firms. The hypothesis Ho2 that “there is no significant relationship between aggressive investment policy and profitability of the firms” is also rejected. However, except for SIZ, no other variable is found to be a good determinant of P in case of established firms.

### Remarks

P is the most spoken of issue in case of corporate firms as it always leads to maximize the value of the firms thereby enables the firms to maximize the wealth of the shareholders. Numerous variables are found to influence the P belonging to different categories. Therefore, in the present study AG is considered to be a dominant factor which deviate the relationship between the explanatory variables and the P. The study proves that AG is found to have a positive relation with P which establishes the fact that the established firms are able to earn a higher P. The results of the analysis of firms of various AG categories show that the new firms should concentrate on GROW and their position is still vulnerable to VOL, which should be avoided. The growing firms, on the other hand, show more stable earning capacity and having no impact of VOL on P. However, the established firms are in comfortable position and have to concentrate on increasing sales. Thus, the outcome of the study may be quiet useful to enhance the P and GROW of the firms in food industry in India.

### Suggestions

- The new firms should concentrate on GROW and should see to that the VOL is less to increase the P.
- The growing firms, on the other hand, should focus on expansion and slight VOL in earnings does not influence the P to a great extent. Aggressive utilization of assets to increase production may increase its P.
- Improving the sales margin is found to be the crucial factor in determining the P of the established firms.

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