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DETERMINANTS OF MARKET ENTRY: A STUDY ON TURKISH MANUFACTURING INDUSTRY (1996–2001 PERIOD)

1. INTRODUCTION

The purpose of this paper is to explain the determinants of market entry for Turkish firms in manufacturing sector for the period of 1996−2001. Market entry is explained by a set of explanatory variables such as profitability, industry growth rate, labour productivity, concentration ratios, average wage rate, advertising intensity, research and development intensity and capital requirements. Domestic industry characteristics and the size of sunk costs are important to understand the market behaviour.

One important paper about the market structure was Bain's (1956) paper. Bain has defined entry conditions according to the incumbent firm's cost advantages over potential firms. He explained three advantage categories as certain cost advantages, advantages deriving from product differentiation and economies of scale. This paper analyse the market entry determinants using product differentiation advantages as advertising and R&D expenditures, industry growth rate, previous entry and exit variables. In addition advertising and R&D expenditures as sunk costs, make the market more concentrated by effecting the firm behaviour and market structure as an entry barrier.

Some other important literature that we were influenced by was Orr's paper (1974) which concentrated on entry barriers for Canada manufacturing industry. Capital requirement and advertising intensity were found as entry barriers for Canada manufacturing industry. While the size of industry has a positive effect on entry previous profit rate and previous industry growth rate has a positive but weak relationship with entry. The others were Khemani, Shapiro (1986), MacDonald (1986), Acs ve Aundrescht (1988).

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MacDonald (1986) analysed American food industry for the 1976–1982 period. Entry has a positive relationship with profitability and industry growth rate. Advertising expenditures and capital investments are two important entry barriers. While Khemani and Shapiro (1986) analysed determinants of entry for Canadian manufacturing industries again. Increase of scale economies was seen as entry barrier in firm level. Industry growth rate and profitability causes entry. Acs ve Aundrescht (1988), analysed net entry of small firms cross-section analysis for 247 manufacturing sectors in 1978–1980 period. Capital and advertising intensity were found negative and statistically significant. However they were not an important entry barrier for the firms which employ 500 and less. R&D was negative and significant. Driffield (1999) paper has demonstrated that foreign entry is attracted by industry level profitability and performance, but firm specific 'ownership' advantages are also important. In the literature one can see conflicting results about the expectations of the signs of the coefficients. So each case must be considered according to the specific country's economic conditions.

The main purpose of this study is to examine the determinants of entry for Turkish manufacturing industries for the 1996–2001 period. The data used in the study includes 4-digit manufacturing industries. As for the entry and exit rates of the Turkish manufacturing industry, the availability of new data is quite limited. The results for the particular period shows that advertising and R&D expenditures are quite low. The reminder of this paper is organised as follows: Section 2 and 3 examines the theoretical framework of the firm's entry and exit behaviour. Section 4 introduces the variables that will be used in the model. Section 5 shows the estimation results and concludes the study.

2. THE ENTRY

One of the studies for Turkish Manufacturing Industry was Kaya and Üçdoğruk (2002); in this study a dynamic panel data with Arellano-Bond *GMM* (1991) estimation was used for the period of 1981–1997. Entry is tried to be explained by profit margin, labour productivity, concentration, average wage rates, intensity of advertising, capital requirement. All the explanatory variables were found to be effective for both entry and exit.

Another study by Günalp and Cilasun (2006) analysed the period of 1993–1999 and found that previous entries are effective on current year's entry and also reel interest rates are effective on firm's entry decisions. Entry has a positive relationship with profitability. Concentration rate is expected negative. This means, concentration rate is entry barrier for new firms for entering.

We use raw data from 60 Turkish four-digit manufacturing industries from 1996–2001 periods provided by Turkish Statistical Institute (TIS). Since there is a methodological change in statistics, we end the data period in 2001. Survey data is classified according to Classification of Economic Activities in the European Community (NACE Rev.2). The new data were organized after 2001 which neither can be integrated nor be transformed to the previous data set. The probability of firm entering an industry is determined by previous entries:

$$Entry_{i,t} = \frac{\sum_{i=1}^{i=60} X_{it} + \sum_{i=1}^{i=60} X_{it-1}}{\sum_{i=1}^{i=60} X_{it}}, \quad (t=1,...,6), \tag{1}$$

where: $X_{i,t}$ is the entry rate of period t in i-th industry. It is the ratio of incumbent firms that are staying one year in industry plus entering firms in period t, to the total number of firms. Our set of variables consist of advertising intensity (*ADV*), R&D intensity (*R&D*), industry growth rate (*IGR*), profitability rate (*PROFIT*), concentration rate (*CON*), besides entry and exit rates.

3. THE EXIT

Exit refers to the costs that must be covered after leaving a specific industry. Exit barriers occur when the firms' capital cannot be recovered. By definition, sunk costs are among the most important exit barriers (Rosenbaum, Lamort 1992). There is a powerful relationship between entry and exit. Exit barriers could be seen as barriers to entry as well, since exit barriers reflect the cost that a firm should bear while leaving the market if it fails to survive (Caves, Porter 1976; Shapiro, Khemani 1987).

For Turkey, macroeconomic variables are more effective than micro ones for the firm's exit in the study of Turanlı and Kılıç (2009). The relationship between advertising expenditures and exit was found positive and also positive for concentration and exit in the same study.

Exit$_{i,t-1}$ is the ratio of incumbent firms that are staying one year in industry plus firms which going out from industry to the total number of firms in period t.

$$Exit_{i,t-1} = \frac{\sum\limits_{i=1}^{i=60} E_{it} + \sum\limits_{i=1}^{i=60} E_{it-1}}{\sum\limits_{i=1}^{i=60} E_{it}} \; . \tag{2}$$

4. THE MODEL

The model is a similar version of Orr's paper. The first difference of the variables is used in dynamic panel equations. The lagged value of the dependent variable is taken as explanatory variable in the model. The indices i and t are "*industry*" and "*time*" respectively. For the problem of multicollinearity the first differences of the variables were taken. The results of the "*without advertising*" estimation were included in the text. However there was not much difference between the coefficients. The model is:

$$ENTRY_{i,t} = \alpha_0 + \alpha_1 ENTRY_{i,t-1} + \alpha_2 ADV_{i,t} + \alpha_3 R\&D_{i,t} + \alpha_4 EXIT_{i,t-1} + \\ + \alpha_5 IGR_{i,t} + \alpha_6 PROFIT_{i,t-1} + \alpha_7 EXPORT_{i,t} + \alpha_8 CON_{i,t} + U_{i,t} \tag{3}$$

Table 1. Descriptions of the variables

Variables	Description	Formula
$ADV_{i,t}$	Advertising expenditures divided by industry sales	$\dfrac{ADV_{i,t}}{INDUSTRY\ SALES_{i,t}}$
$PROFIT_{i,t-1}$	The difference between value added and payment made to workers divided by previous year's sales.	---
IGR	Industry growth rate is calculated according to the Orr (1974) paper.	$\dfrac{Q_{i,t} - Q_{i,t-1}}{Q_{i,t-1}}$
$R\&D$	R&D expenditures divided by industry sales. R&D expenditures is calculated according to the Orr (1974) paper.	$\dfrac{R\&D_{i,t}}{INDUSTRY\ SALES_{i,t}}$
CONCENTRATION RATE	Herfindahl index	---
EXPORT RATE	Export divided by total industry output	$\dfrac{EXPORT_{i,t}}{INDUSTRY\ SALES_{i,t}}$
$U_{i,t}$	Random component	

Source: own elaboration.

Table 2. Descriptive Data

Variables	Mean	Standard Deviation	Minimum	Maximum
ENTRY	1.2954	0.6441	0.7777	6.3864
EXIT	1.1974	0.4999	0.7575	5.2758
R&D	0.0023	0.06589	0.0000	0.0977
IGR	0.7985	0.9947	0.0000	15.980
PROFIT	0.5059	0.28087	0.0000	2.9734
ADV	0.0077	0.0117	0.0000	0.0922
EXPORT	0.4716	1.0686	0.0000	10.4385
Concentration (*CON*)	3.7138	0.5136	2.0384	4.6051

Source: from econometric-views.

Table 3. The estimation results with advertising (Arellano-Bond *GMM* Estimation)

Explanatory variables	Coefficients	Expected Sign
ENTRY$_{(-1)}$	1.2111 (0.1196)[a]	(+)
EXIT	-0.2228 (0.2261)	(+)
R&D	-1.304261 (2.2912)	(-)
IGR	0.02757 (0.0250)[a]	(+)
PROFIT	-0.398045 (0.15008)[b]	(+)
ADV	-2.893863 (3.1442)	(-)
EXPORT	0.495405 (0.01509)[a]	(+)
CON	1.291870 (0.6607)[b]	(-)
Sample	360	360
R^2	0.46	0.46

Note: values in parenthesis show standard deviations; a: 1% level, b: 5% level meaningful.

Source: from econometric-views.

Table 4. The estimation results without advertising (Arellano-Bond *GMM* Estimation)

Explanatory variables	Coefficients	Expected Sign
ENTRY$_{(-1)}$	1.2539 (0.1137)[a]	(+)
EXIT	(-)0.2705 (0.2145)	(+)

Table 4. Continuation

Explanatory variables	Coefficients	Expected Sign
R&D	(-)1.3923 (1.9149)	(-)
IGR	0.02083 (0.0253)[a]	(+)
PROFIT	(-)0.38124 (0.14593)[b]	(+)
EXPORT	0.44824 (0.01360)[a]	(+)
CON	1.291538 (0.64605)[b]	(-)
Sample	360	360
R^2	0.44	0.44

Note: as under Table 3.

Source: from econometric-views.

5. CONCLUSIONS

Current year's entry rate is statistically positive and meaningful. Previous entry rate affects the current entry rate positively. Current entry rate is higher in industries in which previous entry rate is high.

Previous exit rate is found negative and insignificant contrary to the expectation. This means that exit do not cause new entries. The year 2001 was the beginning of an economic crisis in Turkey, so this may be a good reason for incumbent firms to exit.

The variable of industry growth rate (*IGR*) is found positive and significant showing that growing industries are found attractive by potential firms.

The signs of the concentration and profitability rates are not found as expected and insignificant. This can be explained by Customs Union did not have a significant effect on concentration ratio, especially for R&D industries (Same in Arvas, Mıhçı 2014: 80). Another reason may be incumbent firms do not have adequate institutional experience to restrain new entries. Survival of new firms is difficult with high concentration intensity (Turanlı, Kılıç 2009: 10).

Advertising and R&D intensity were found insignificant and negative. There is a contrast in different studies about the effect of advertising on entry behaviour of firms. For example, according to Nelson (1970; 1974), advertising has an informative function for the consumers. So this view forms a negative expectation for advertising. There are some new studies especially

in the pharmaceuticals industry. These are about the effect of advertising on market entry for pharmaceuticals are in line with our findings that advertising by creating product differentiation can induce market entry (Königbauer 2007: 286). However according to Comanor and Wilson (1967), advertising decreases the cross-price elasticity of demand by creating consumer dependency and it decreases the substitutability of goods. So, the expectation for advertising is positive, since it has been seen as an entry barrier for new entrants. In order to attract new consumers, new entrants must make a higher volume of advertising expenditures than their competitors.

Export concentration was found positive and significant as expected. New entries are higher in sectors in which exports are higher.

Considering these results, it is possible to say that the variables of entry and exit were statistically significant. Entry behaviour is determined by a set of macroeconomic variables among two of them are very important. These are industry growth rate and export ratio. Both of these variables were found statistically significant and have a positive effect on entry. They can be used to reflect the economic structure of the market to understand the entry behaviour in the country.

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ABSTRACT

In this article we study on determinants of market entry behaviour of 60 four-digit Turkish manufacturing industry for the 1996−2001 period. We estimated a model using *GMM* (*Generalised Method of Moments*). The results show industry growth rate and exports are important to determine entry behaviour for the period and the previous period's entry is effective on current entries. The entry and exit rates of the firms were taken from Turkish Statistical Institute's (TIS) resources and changed from SIC Rev 3 to SIC Rev 2. The other variables were taken from SIC Rev 2. The reason why the data were limited to the year 2001 is advertising expenditures were not available. The data includes all the state and private firms that employ 10 workers and above.

UWARUNKOWANIA WEJŚCIA NA RYNEK: BADANIE TURECKIEGO PRZEMYSŁU PRODUKCYJNEGO (W LATACH 1996-2001)

ABSTRAKT

W artykule badano oddziaływanie reklamy i wydatków na badania i rozwój na zachowania wejścia na rynek 60 cztero-cyfrowych gałęzi przemysłu w okresie 1996−2001. Estymowano model za pomocą Uogólnionej Metody Momentów (*ang*. *GMM – Generalised Method of Moments*). Wyniki wskazują na wzrost przemysłu i eksportu są ważne dla określenia zachowania początkowe okresu pierwszego oraz są determinowane przez wartości wejść z poprzedniego okresu. Stopy wejścia i wyjścia firm zostały zaczerpnięte z Tureckiego Instytutu Statystycznego (TIS) środków i zostały przeliczone z systemu SIC Rev 3 do SIC Rev 2. Inne zmienne nie wymagały takiego przejścia i pochodziły bezpośrednio z baz danych SIC Rev 2. Powodem, dla którego dane zostały ograniczone do roku 2001 była niedostępność danych dla nakładów na reklamę. Dane obejmują wszystkie państwowe i prywatne firmy, które zatrudniały w okresie analizy nie mniej niż 10 pracowników.