

RESEARCH ARTICLE

The Main Determinants of Firm's Revenues: An Empirical Analysis of Kazakhstan Telecommunication Market

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Abstract

Understanding the determinants of firm's revenue generation has a vital importance on management decisions, yet often this is a misunderstood matter. Previous research attempting to model the relationship between firm's revenues and its determinants ascribe too much importance on factors within management's control and as a consequence overemphasizing competitive aspects. The author by using data from a single consumer product market in a country with growing population, incomes and consumer spending, demonstrates a case where the effect of competition disappears and attributes this result to the characteristics of the country and economy.

Keywords: *Revenues, Competition, Market share, Growth.*

JEL Classification: L 10, L 60

Introduction

What drives revenue generation is an important question for both top managers and marketing executives. Traditionally, it is believed that revenue generation depends on marketing actions and business acumen. If so, this will be demonstrated in the degree of instability of market shares in a given industry. This metric, especially among the industry's leading firms, provides a measurable indicator of rival's behavior in oligopolistic markets [1]. The more unstable are the market shares of the leading firms in an industry the more dependant would be the revenue generation on marketing actions and business acumen. Masatoshi and Honjo find significant relationship between concentration and market share instability, and the market shares of leading firms are more stable in highly concentrated industries [6]. Eckard examines if advertising reduces the firm's market share instability by creating market power [4]. If advertising increases product differentiation and brand loyalty, then it also reduces demand cross elasticity and stabilizes market shares. He examines the combined market shares of top four firms in a large sample of US industries and concludes that advertising doesn't affect market share instability. Davies and Geroski find innovation to stimulate market shares mobility and firm growth, meaning that research and innovation intensity may have a positive effect on market share instability [2]. On the other hand, if technological progress exerts a role as an entry

barrier, thereby fixing the market shares of leading firms, then it may be that the effect of research and innovation intensity on market share instability is negative. In fact, Davies and Geroski also find that both positive and negative growth in demand brings greater uncertainty of leading firms i.e. the market shares of firms in industries with demand uncertainty are less stable than those in relatively demand-stable industries. To the same conclusion arrives Masatoshi, providing evidence that industry growth has a significantly positive effect on market share instability in the Japan manufacturing industries.

However, despite the evidence that often industry competition is limited, it is surprising to find the existence of research on factors, mostly within management's control, influencing firm's revenues, profit, cash flows or shareholder value that ignores the role of instability of market shares. Gruca and Rego model the link between customer satisfaction and shareholder value and find that satisfaction creates shareholder value by increasing future cash flow growth and reducing its variability [5]. They correctly realize that that a firm's cash flows are influenced in part by the industry in which it competes though they use a biased metric - Hirschmann-Herfindahl index, to account for its effect. According to Davies and Geroski, volatile market shares are not necessarily inconsistent with relatively stable

industry concentration levels, since one market leader's gain may simply be another's loss. Thus, the change in concentration does not necessarily reflect competition among leading firms, and is open to interpretation. Even if the concentration ratio, however, is found to be almost constant over time, fierce competition may still exist among leading firms. That is, the index of concentration ignores the shift of market shares among leading firms. Other authors, such as Mueller and Hamm, Mueller and Rogers use as well changes in the four-firm concentration ratio as a measure of market mobility [7] [8]. Weiss models the firm's market share (and therefore revenues) based on factors such as price, advertising expenditures, retail availability and product characteristics [3]. The model presented by the author doesn't use any metric accounting for the effect of competition, though the author correctly notices that consumer purchasing decision are a function of economy factors alongside other and concludes that his model is suitable for understanding only short-term movements of market shares.

It is also surprising that it is hardly to see a research that takes into account the form of market organization-oligopoly, monopoly, perfect or monopolistic competition and the type of industry – industrial or consumer. For the importance of these factors we can judge by research on the factors determining store brand market shares on the Spanish consumer products market (monopolistic competition), done by Rubio and Yague [10]. The authors develop a theoretical model using a group of determinants of the demand for store brands, among which competitive strategy and market structure. The competitive strategy they present as function of prices and differentiation while the market structure as a composite of market growth, and degree of rivalry measured as the dispersion (variability) of market shares. They reach the conclusion that retailer's market share is influenced by competitive strategy (particularly for the price differential between manufacturer and store brands), and of market structure (especially for retailer concentration, manufacturer brand concentration and market growth rate).

Given the facts presented above the aim of this study is to better understand what really drives firm's revenues and in particular the impact of competition. To achieve this we will use data from a consumer product market with oligopolistic structure. Our hypothesis would be that the amount of total revenues generated in the industry in each of the years in the analyzed

period will be related to the degree of competition if the last is high.

The Model

At a basic level, it is obvious that the revenue generated by an individual firm will depend on the amount of goods and services it sells and the prices it charges for them. Both of these factors depend on the characteristics of the economy, competitive environment and choices the individual firm makes. To model the effect of these characteristics on the amount of revenue generated by a firm we develop an empirical model that summarizes all of them. We start with simple expression of the relationship between firm's revenue, amount of goods and services it sells and the prices it charges for them:

$$REV = Output \times Price \quad (1)$$

Then we decompose the two elements of the right part of equation (1) to examine the factors influencing output and price.

Thus the amount of output will depend on factors such as: number of buyers, purchasing power and willingness to buy in general and in particular the product the firm sells.

$$Output = f(Population, Purchasing Power, WTB) \quad (2)$$

Increasing population will be leading to increasing number of potential buyers and vice versa, decreasing population to decreasing number of potential buyers.

The purchasing power will be the extent to which individuals have the available funds to buy products and services. It will depend on their disposable incomes, expected incomes and availability of credit.

The willingness to buy is more difficult to model because it is dependent on factors related to the individuals themselves and the product the firm sells. Some of the factors on the consumer side are factors such as: expectations about future prices (expectation of future high prices promote spending now), interest rates (if interest rates are high they will inhibit spending through providing saving incentives), wealth (if stock of wealth, savings, home, cars, art etc., is low it will then inhibit spending through negative impact on consumer confidence), saving attitudes (low saving rate positive to spending), show off effect (looking for demonstration of status increases spending). On the other hand, on the product side, a completely different set of factors is impacting the willingness to buy: type of product (new, old, luxury, necessity etc.; different types of products

will be associated with different demand), market saturation (the more saturated is the market the lower will be demand), availability of product substitutes (demand can shift between the two substitutes), availability of products (the larger the portfolio of products available for sale at affordable prices the higher the likelihood of purchase).

The second element of equation (1), price, can be decomposed into two factors that would be expected to influence its level: degree of competition and inflation.

$$Price = f(Degree\ of\ competition, Inflation) \quad (3)$$

When companies are motivated by profit, competition drives the company, and their stakeholders to become competitive, through the process of making the business more appealing and efficient. Competition occurs when two businesses are competing for the same customers. Well know are the factors determining competition defined by Porter in 1989: number of and size of competitors, industry growth, degree of product differentiation, fixed costs, industry capacity, brand loyalty, switching costs, exit barriers [9].

Inflation, measured by the consumer price index (CPI), can have a twofold impact on prices. From one hand growing prices can provide opportunity for the individual firm to increase prices while from another it can present a threat on it since growing prices can leave the consumers with less money left to spend for the product the individual firm sells.

Data Description

We use data from the Kazakhstan mobile telecommunications market consisting of the amount of service revenues generated by all the three players on the market in each of the years from 2007 to 2013. The data is published periodically by the shareholders of these companies. Based on this data we calculate total industry revenues, revenue market shares and degree of market saturation. Economic data such as population, incomes, saving etc. we obtain from the Kazakhstan Statistics Agency. All financial and economic data is presented in local currency units.

Empirical Estimation

To analyze the relationship between the firm's revenues and output and prices we constructed a data set with yearly observations on (1) total industry revenues (market size) expressed as the

sum of revenues generated by each individual firm presented ($Y = \sum_{j=1}^n Y_j$), (2) total consumer spending obtained as a function of population (P), average household disposable income (HI), saving rate (R) i.e. $CS = f(P, HI, R)$, (3) degree of competition calculated as the relative market share¹ of the second largest player to the first largest player i.e. $RMS = J_2/J_1$, (4) degree of market saturation measured as the revenues derived from sales of the product line with the highest growth to total revenues i.e. $DMS = R_{top\ product} / R_{total}$. We leave the inflation

variable for two reasons: first, because it is indirectly reflected in consumer spending through rising personal incomes (resulting from yearly salaries indexation), and second, because personal mobile communication expenses are relatively small portion of personal consumer expenditures to alter significantly consumer behavior.

To test the significance of this equation we estimated the following model:

$$Y = \alpha + \beta_1 CS + \beta_2 RMS + \beta_3 DMS, \quad (4)$$

where β_1 , β_2 , and β_3 are the parameters to be estimated.

In Fig. 1, we graphically illustrate the potential relationship between the two key variables i.e. market size and consumer spending.

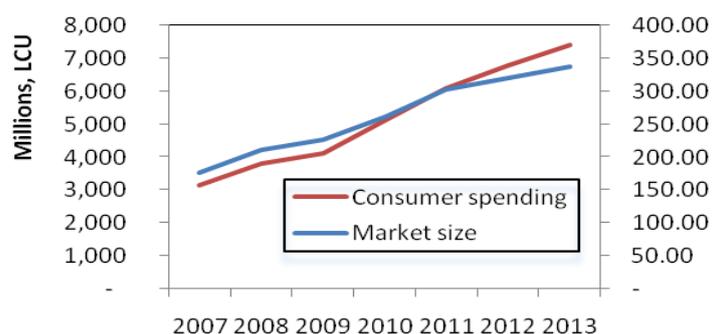


Fig. 1: Relationship between market size and consumer spending

¹ The choice of these variable was done for reasons already explained in the Introduction i.e. volatile market shares are not necessarily inconsistent with relatively stable industry concentration levels, since one market leader's gain may simply be another's loss. Thus, the change in concentration does not necessarily reflect competition among leading firms, and is open to interpretation.

To estimate the model we use the least-squares method to model the relationship between the dependant and explanatory variables. Summary

statistics for the different variables appear in Table 1.

Table 1: Summary statistics

	M	SD	Minimum	Maximum
Market size	262 084 130	60 973 145	175 834 440	338 045 114
Consumer spending	5 213 179 579	1 614 428 282	3 146 699 124	7 421 025 777
Degree of competition	0,7	0,0	0,6	0,7
Degree of market saturation	5,0	5,3	-	13,0

We present empirical results in the second column of Table 2. The proposed model in Equation (4) explains almost all in the variation in total industry revenues ($R = 0.99$, $R \text{ Adj.} = 0.99$). Furthermore, β_1 is significant (0.048 , $p = 0.002$), as is β_2 ($\beta_2 = -5267863$, $p = 0.01$), and β_3 is not statistically significant.

Table 2: Parameter estimates of total industry revenue model

	Coefficient	P value
Intercept	184 510 800	0.25
Consumer spending	0.048	0.002
Degree of competition	-217 594 969	0.26
Degree of market saturation	-5 267 863	0.01
R Adj.	0.99	

The Jarque-Bera test did not indicate violations of the residuals' normality assumption ($p = 0.1$, 0.95 significance level), Jarque-Bera is equal to 4.42 and Chi Square to 5.99 (we can't reject the null hypothesis of normality). The Durbin-Watson statistic is very close to 2 indicating no problems with autocorrelation. However we found evidence of heteroscedasticity (LM stat was higher than the Chi Square of 5.99) which required the recalculation of the model to obtain White's corrected standard error estimates. The heteroscedasticity corrected results again confirmed the statistical significance of the β_1 ($p = 0.0005$) and β_2 ($p = 0.004$) coefficients.

Model validation

To validate our findings, we dropped the degree of

competition variable and re-estimated the model. The corresponding estimates appear in the second column of Table 3. In all cases, β_1 (0.054 , $p = 0.0001$) and β_2 ($\beta_2 = -5 098 563$, $p = 0.01$), remained significant and of comparable magnitude to the base model.

Table 3: Parameter estimates of total industry revenue model (variable β_3 omitted)

	Coefficient	P value
Intercept	6 272 420	0.7
Consumer spending	0.054	0.0001
Degree of market saturation	-5 098 563	0.01
R Adj.	0.99	

Thus, the parameter estimates were robust across alternative specifications and suggest that consumer spending and degree of market saturation have predictive power above and beyond information contained in those other variables.

Conclusion

We find that consumer spending alongside with degree of market saturation explains almost fully the amount of revenue generated in the telecommunication industry in Kazakhstan. The growth of consumer is positively correlated with the growth of industry revenues. On the contrary, growing market saturation puts a break on revenue growth. Furthermore, we couldn't find evidence showing the existence of a link between the degree of competition and total market

revenues. This observation contributes to the growing evidence base that competition in some telecommunication markets is virtually absent. Our results suggest that in growing markets like Kazakhstan it would be a winning strategy not to take excessively into account the moves of competitors because this can bring more damage than benefits. In the period we observed the market revenue growth can be entirely explained by the growth of consumer spending and the presence of a top fast selling product. In an expanding market where growth comes easily matching competitive offers would be a race to the bottom making all players worse off to the benefit of the customer.

All being said, our research has several limitations that suggest areas for future inquiry.

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Our findings are confined to the Kazakhstan telecommunication market, and it would be prudent to generalize them to other market and countries. Markets differ in terms of economy growth, incomes growth, consumer expenditure growth, degree of saturation and maturity and also very important – degree of rivalry (there are very competitive markets and extremely uncompetitive ones).

Lastly, better understanding of the factors determining the development of industry revenues will lead to not only better marketing plans and forecasts but also to better decisions in all major business areas.