The Impact of Inventory Scale, Installment and Financing Policies on Sales Growth of Vietnamese Real Estate Companies

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Abstract: *Instead of the normal approach, this paper addressed sales growth by an economic growth model. The research applied the S-GMM in dynamic panel data of Vietnamese real estate companies during the period of (2011-2018). This paper showed that inventory scale, installment payment and financing policies are the major positive factors affecting sales growth. Real estate's characteristic is their increasing price trend over time, suggesting companies with larger inventory scale potentially earn higher revenue. The installment policies is also another trait of the field, implying that companies with strong enough capital to support installment policies can further increase sales. Therefore, a capital structure with high financial leverage is consequently a management's choice to respond to the needs of sales growth.*

Keywords: Inventory scale, Installment policies, financing policies, Sales growth, Real estate companies

1. Introduction

Real estates has always been the most valuable assets of every nation, and the development of the real estate market is always the center of all countries' economic focus. In Vietnam, the real estate market is estimated to account for about 40% of its total asset, and around 30% of its total economic activities. Although the general increasing trend of the market's price level is the cause of real estate companies' sales growth, high inventory level is also currently a liquidity burden for them during the year 2019. Despite that, the amount of credit funds for those companies as well as their customers still continuously increases, proving that their inventory scale as well as sales policies are the main concern of their management as well as investors.

The management of inventories and receivables is usually linked to a business' profitability, and there were many researches on this topic in the past (Filbeck& Thomas, 2005; Firmansyah et al., 2018; Iqbal et al., 2014). However, in order to gain profit a business has to first sell its products, and record its sales. In the generally common state of both high inventory level and high leverage, companies are under a very high pressure when they cannot sell quickly enough. As a result, increasing sales thus improving liquidity has become the most important prerequisite for a real estate enterpirse's survivability.

As of now there have been few researches about the impact of inventory scale or sales (Motlíček & Martinovičová, 2014). However, no research has ever considered all of the following factors' effect on sales: Inventory scale, installment policies and financing policies, creating a research gap this paper is aiming to address. This research gap is further qualified by the fact that the real estate market, with its high level of inventories and high leverage characteristics. Therefore, the addition of empirical researches on the impact of those above factors on the sales growth of Vietnamese real estate companies is a necessity

This paper's main focus can be divided into two elements: (1) Identifying the impact level of inventory scale as well as installment policies on real estate enterprises' revenue trend and (2) Suggesting suitable credit supply for those enterprises to satisfy their capital needs and thus ensuring their long-term growth.

2. Theoretical basis and literature review

2.1 Theoretical basis

This research's main focus is the impact of inventory scale, sales policies and capital structure of real estate companies on their sales growth. The measure for sales growth is calculated based on Cobb-Douglas production function, with an addition of variables reflecting human resources similar to Mankiw et al. (1992). Hence, companies' sales growth is expressed as a response variable dependent on Physical Capital (K), Human Capital (H), Labour (L) and Technology (A):

$$Y = A.K^{\alpha}.H^{\beta}.L^{1-\alpha-\beta} \text{ with } 0 < \alpha, \beta < 1 \text{ (1)}$$

Among the explanatory variables, they are described as follow: Physical capital (K) reflects the level of physical capital causing sales growth. For companies, physical capital is their inventory level and credit sales funding; Human capital (H) in companies reflects their management quality, which is important due to management being the direct people to operate a company and make decisions regarding its investments or fundings and especially the company' capital structure, all of which will be used to represent the Human capital factor.

In summary, Inventory scale and Sales policies will affect sales growth through Physical capital (K), which was based on the Cobb-Douglas function; While the factor of financing policies will affect the above response variable through Human capital (H) based on Mankiw et al. (1992)'s

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approach.

2.2 Literature Review

According to past researches, the impact of inventory scale as well as companies' installment policies were analysed through working capital policies (Filbeck & Thomas, 2005; Firmansyah et al., 2018; Iqbal et al., 2014). When a company invests in its inventories, that amount will be tied up to the inventories acquired. Similarly, the amount spent on installment policies' funding is tied up to the installment plans it supports. Consequently, the impact of the policies regarding inventory and receivable management are usually considered when the research is about profitability. However, past papers of this field mainly focused on how inventory scale and installment policies affect a company's profitability (Mathuva, 2010; Raheman & Nasr, 2007; Ahmed et al., 2017) rather than their effects on sales growth.

In particular, Motlíček and Martinovičová (2014) confirmed a positive impact of inventory as well as credit sales scale on revenue growth on machinery and equipment manufacturers in Czech Republic. When its inventory level increases, a company has more products to sell, therefore a ground to increase their sales, which was further supported by Aleksandar et al, (2015) and Cachon et al, (2018) in their respective researches. Fewer papers were written about the effect of financing policies on sales, one of which was the article by Yazdan Far and Öhman (2015), where they study about the impact of credit supply on the sales growth of Swedish small and medium enterprises (SMEs) by applying a three-stage least square (3SLS) method. The result of the above research indicated that commercial credit supply, through their funding of receivables, can have a positive effect on sales growth. Also of a similar point of view, Irfan and Ali (2017) confirmed that the funding for commercial credit policies would contribute in increasing revenue. However, long-term decision making on credit supply would have to follow a trade-off rule, where it can actually adversely affect long-term revenue. At present, there has been little research on both the impacts of inventory scales and installment policies on sales, especially in the real estate field in spite of its special characteristics of high inventory scale and high funding for installment policies. Historically, investment financing policies were usually researched through the effects of financial leverage on profitability (Dalci, 2018; Yazdanfar & Ohman, 2015; David & Olorunfemi, 2010), which could be highly relatable to the highly-leveraged real estate companies. As a result, the further addition of a new study on impacts of inventory scale, installment policies and financing policies on sales growth would attract the attention of companies in the real estate field, and thus contribute to filling the past research gap.

3. Methodology

3.1 Model

Instead of the traditional approach, in which sales growth is expressed according to the formula of price times quantity sold, this paper utilises a Cobb-Douglas function with an addition of Human capital, similar to Mankiw et al (1992).

Therefore, the Cobb-Douglas production function based on time t to determine the sales growth of company i would be rewritten as:

$$Y_{i,t} = A_{i,t}.K_{i,t}{}^{\alpha}.H^{\beta}{}_{i,t}.L_{i,t}{}^{1-\alpha-\beta} \text{ with } 0 < \alpha, \beta < 1 \text{ (1)}$$

When we log both sides, (1) becomes:

$$Lg(Y_{i,t}) = lg(A_{i,t}) + \alpha.K_{i,t} + \beta.H_{i,t} + (1-\alpha-\beta).L_{i,t} \text{ (2)}$$

We can further apply the following conditions to (2):

- The output value of a company is its sales. As a result, sales growth is determined by the log of sales
- Physical Capital ($K_{i,t}$) a company employs to create sales includes inventories (inve) to satisfy the needs to transform the above inventories to sales, as well as funding for receivables (rece) to further push the sales of a company (Motlíček & Martinovičová, 2014). In order to be consistent with sales growth, inventory scale and receivables' funding scale are also valued as their respective logs.
- Human Capital (H) of a company is represented through management's decision on financing policies (fina) to satisfy the capital needs following revenue growth (Irfan and Ali, 2017). This decision is made by management when they face the choice of whether to finance their company with debt or with equity. This results in the variable being calculated from the debt to equity ratio of a company.
- Labour factors (L) creates sales from the production to the selling process, with the labour expense being included in the products' costs of goods sold (CoGS). Therefore, the ratio between CoGS and sales both reflects the labour expense of each product sold, and the company's basic competitiveness: When a company has low CoGS to sale ratio, it can actively lower its price to be more competitive against similar products (Udell, 1964). As a result, this paper uses CoGS to sale ratio (cogs_sales) to both represent the Labour factors and companies' competitiveness in selling their products, thus adding in their sales growth.
- Technology factors (A) affects sales growth through the use of modern technologies in production and management. Specifically, the application of information technology into business contributes to revenue growth (Mithas et al., 2012; Mashal, 2006). Consequently, this paper uses the ratio of Earnings before interests and taxes (EBIT) to sales (ebit_sales) to represent the Technology factors. According to the approach of Thanh and Canh (2020), the effect of technology on sales is usually expressed as a productivity function, therefore: $Lg(A_{i,t}) = A_0 + \delta.(ebit\_sales)_{i,t}$.

When replacing the above factors into (2), we have the following model:

$$Lg(y_{i,t}) = \lambda_0 + \lambda_1.lg(inve_{i,t}) + \lambda_2.lg(rece_{i,t}) + \lambda_3.(fina)_{i,t} + \lambda_4.(cogs\_sales)_{i,t} + \lambda_5.(ebit\_sales)_{i,t} + \varepsilon_{i,t} \text{ (3)}$$

When looking into (3), we can see that companies' sales growth is dependent on the following factors: Inventory scale (inve) and Fundings for Receivables scale (rece) represents Physical capital; Financing policies (fina) represents Human capital; CoGS to sales ratio (cogs_sales) represents Labour factors; and the EBIT to sales ratio (ebit_sales) represents Technology factors. Based on the long-term economic growth model approach, current period's revenue would

provide companies with the financial sources to reinvest, creating next period's revenue. As a result, growth models usually employ lagged response variables (Thanh & Canh, 2020; Fufa& Kim, 2018; Zahonogo, 2016). Therefore, the resulting dynamic model is:

$$\Delta Lg(y_{i,t}) = a_0 + a_1.lg(y_{i,t-1}) + a_2.lg(inve_{i,t}) + a_3.lg(rece_{i,t}) + a_4.(fina)_{i,t} + a_5.(cogs\_sales)_{i,t} + a_6.(ebit\_sales)_{i,t} + \upsilon_i + \mu_{i,t} \quad (3)$$

In details:
- $i = 1,2,\ldots\ldots,48$ indicates the company samples;
- $t = 2011, 2012,\ldots\ldots, 2018$ indicates observation time;
- υ_i is companies' fixed effect vector;
- $\mu_{i,t}$ is the error, which has a homogeneous independent distribution within the range of 0 to the variance of μ, $\mu_{it} \approx$ i.id $(0, \sigma_\mu^2)$;
- $y_{i,t}$ is the sales, and $\Delta Lg(y_{it})$ represents sales growth;
- $inve_{i,t}$ is the companies' inventory scale;
- $rece_{i,t}$ is the companies' funding policies for receivables;
- $fina_{i,t}$ is the companies' financing policies;
- $cogs\_sales_{i,t}$ is the ratio of CoGS to sales, representing Labour factors;
- $ebit\_sales_{i,t}$ is the ratio of EBIT to sales, representing Technological factors

3.2 Data

The panel of data was collected from the financial statements of real estate companies listed on the two Vietnamese stock exchanges. The source of data was provided by Thomson Reuters, hence very reliable. All of the data used were within the years 2011-2018, which was a full cynical cycle of the real estate field, starting from the market freezing period of 2011-2013, followed by a recovery and development era. Among the data gathered, companies appearing in less than 4 years were crossed out from the sample list, leading to a "Strongly balanced" data evaluation result from the STATA software.

3.3 Method

This research uses the STATA 14 software to analyse the descriptive statistics, to test for autocorrelation, heteroscedasticity and to estimate the regression coefficient of model (3). For model (3), because of the lagged response variables there is an endogeneity within the model (Blundell & Bond, 1998). In addition, the time range of the samples (T=8) was shorter than the number of observations (N=48), so the 2-step difference S-GMM model can be employed to analyse this dynamic data panel (Blundell & Bond, 1998). This method allows for a better suited estimation of the

endogeneous growth model than the Fixed Effect Method (FEM) (Arrellano & Bond, 1991; Baltagi, 2005). Compared to the models for static panels such as the Ordinary Least Squares method (OLS), the FEM, the Random Effect Method (REM), the Two-Step Least Squares method (2SLS), the 2-step difference S-GMM method can resolve the matters of endogeneity as well as heteroscedasticity, therefore providing an effective estimation (Windmeijer, 2005)

4. Results and discussion

4.1. Descriptive Statistics

The descriptive statistics results shown in Table 1 below indicate that real estate companies during the period of 2011 – 2018 generally have high inventory scale and receivables funding scale. As for the CoGS to sales ratio, it has a mean of 79%, with a standard deviation of 31.7%, which probably leads to a high standard deviation of the EBIT to sales ratio (5.48). On the other hand, the debt to equity ratio has a mean of 0.95, but a maximum of as high as 48.84, reinforcing the high leverage characteristic of the real estate field.

Table 1: Descriptive statistics

Variable	Obs	Mean	Std.Dev	Min	Max
Lg(y)	379	11.388	0.858	7.710	14.086
Lg(inve)	328	10.584	0.908	7.583	12.680
Lg(rece)	337	10.839	0.693	8.228	12.862
fina	338	0.953	3.645	-23.770	48.839
cogs_sales	382	0.793	0.317	-0.152	4.462
ebit_sales	382	-0.292	5.479	-50.453	41.948

Source: Results from the author's research.

Tests for correlations between explanatory and response variables are further displayed in table 2 below, with a result of low correlation ($\leq$ 0.6, according to Evans, 1996). However, the correlation between inventories and receivables funding policies is 0.64, reflecting a slightly strong positive correlation between the above two explanatory variables. This in turn demonstrates that real estate companies' revenue mainly came from credit sales, particularly through installments.

Table 2: Correlation matrix

Variable	y	inve	rece	fina	cogs_sales
inve	-0.078				
rece	-0.017	0.640***			
fina	-0.213***	0.400***	0.400***		
cogs_sale	0.024	-0.105*	-0.213***	-0.145***	
ebit_sale	0.343***	-0.045	0.094*	0.017	-0.543***

Source: Results from the author's research.

4.2. Testing for autocorrelation and heteroskedasticity

The tests for autocorrelation and heteroskedasticity of model (3) are presented in table 3 below, with a null hypothesis of H_0: The model does not include any autocorrelation or heteroskedasticity. The results of the tests show that the Woodridge Test for autocorrelation in panel data's p-value is $0.066 > 5\%$, meaning accepting the H_0 of no autocorrelation. As for heteroskedasticity test, the Breusch-Pagan/Cool-Weisberg test has a p-value of $0.000 < 5\%$, meaning the H_0

of no heteroskedasticity is rejected.

Table 3: Test for autocorrelation and heteroskedasticity

Test	P_value
Wooldrige test for autocorrelation in panel data	0.066
Breusch-pagan/Cool-Weisberg test for heteroskedasticity	0.000

Source: Results from the author's research.

4.3. Estimating regression coefficients for the research model Experimental research results

Table 4: Compare the results according to POOLED OLS or FEM model

Dependent variable d.lgy	Coef.	p-value
L1.lg(y)	-0.389	0.000
inve	0.374	0.006
rece	0.796	0.001
fina	0.036	0.025
cogs_sales	-0.363	0.000
ebit_sales	0.052	0.000
Const	-0.0399	0.833
Number of instruments	17	
Number of groups	48	
AR(1) test (p-value)	0.011	
AR(2) test (p-value)	0.670	
Hansen test 1 (p-value)	0.819	
Hansen test 2 (p-value)	0.370	
Hansen test 3 (p-value)	0.561	

Source: Results from the author's research.

The result of the estimation showed that the regression coefficients indicated that the explanatory variables all have a statistical meaning with a confidence interval of 5%, with the number of instruments smaller than the number of groups (17 compared with 48). The first-order autocorrelation test AR(1) has a p-value of 0.011 < 5%, while the second-order autocorrelation test AR(2) has a p-value of 0.670 > 5%, proving no autocorrelation exists in the regression. In addition, the Hansen-test of instrument validity (Hansen test 1), the Difference-in-Hansen tests of exogeneity of instrument subsets (Hansen test 2), as well as the Hansen test on over-identifying restrictions (Hansen test 3) all have p-values of more than 5%. The results of the Hansen tests above shows that the estimations for instrumental variables are valid, and the heteroskedasticity as well as the endogeneity problems were promptly dealt with.

According to the outcomes of the research, the regression coefficients of inventory scales and funding policies for receivables are both positive, expressing the explanatory variables' positive impacts on sales growth, which is similar to the study done by Motlíček and Martinovičová (2014). This demonstrates that the more inventories and choices a real estate company has for its customer, the more products it can sell, resulting in the company's increased capital needs in order to invest in more assets. The positive effect of financing policies on sales growth, which is in turn comparable to Irfan and Ali (2017)'s research, implies that real estate companies seem to majorly employ debt financing in response to their capital needs in order to further increase their sales.

5. Finding and Conclusion

Instead of the traditional approach, in which sales is analysed based on price and quantity sold, this research approached companies' sales growth in the form of an economic growth model. The empirical findings about the impacts of inventory scale, installment and financing policies on the sales growth of real estate companies during the period of 2011 – 2018 yields the following conclusions:

- Inventory scales have a significantly positive impact on sales growth. This proves that real estate companies with large inventory scales would have an advantage in increasing their revenue.
- Credit sales, which in reality are executed mainly in the form of installments, account for the majority of real estate companies' revenue. As a result, companies with strong financing for receivables would have an advantage in increasing their revenue.
- For companies' capital financing policies in response to business investments (such as inventories or installment payment supports), the employment of high financial leverage has become a common trend for those doing business in the real estate field. This research also points out that the use of financial leverage in the companies' capital structure also contributes in their sales growth
- This research also finds out evidences for a negative effect of the CoGS to sales ratio (cogs_sales), further confirming that a high CoGS to sales ratio limits a business' competitiveness and thus its increase in revenue over time. On the other hand, the study also indicates that the EBIT to sales ratio (ebit_sales) has a positive effect on sales growth.

The special characteristic of the real estate field is its increasing trend of product prices, resulting in companies' inventory scale being one of the most important factor for its growth. The credit sales policies, mainly for installments, is another major component in a real estate enterprise's development. Therefore, a business having strong enough capital to support its receivable policies is likely to enjoy a consequently strong sales growth as well. Consequently, a capital structure with high financial leverage is usually chosen by management to uphold their companies' growth.

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