Financially Constrained Firms: The Impact of Managerial Optimism and Diversification on Firms' Excess Value: The Case of Greece

Dimitrios Maditinos[1], Alexandra Tsinani[2], Zeljko Sevic[3],
Jelena Stankeviciene[4]

Abstract:

Diversification as an underlying factor of financial constraints can create several costs. Diversified firms have the tendency to over-invest in lines of business which display poor investment opportunities.

Diversification indeed reduces value. This loss in value is found mainly for firms of all sizes having managers with a higher level of optimism.

The link between optimism and corporate investment is more pronounced in financially constraint firms. When the wedge between the internal and external cost of funds increases, a firm is more financially constrained.

Analysing a sample of listed companies in Greece it is found that the higher the managerial optimism, the lower the excess value of a firm.

Keywords: *Managerial optimism, excess value, investment, financial constraints*

JEL codes: *D80, D81, G31, G32.*

[1]*Eastern Macedonia & Thrace Institute of Technology, Dept of Business Administration,* *dmadi@teiemt.gr*
[2]*Eastern Macedonia & Thrace Institute of Technology, Dept of Business Administration,* *atsina10@caledonian.ac.uk*
[3]*Zeljko.sevic@yahoo.co.uk*
[4]*Vilnius Gediminas Technical University, Dept of Finance Engineering, Faculty of Business Management, Lithuania,* *jelena.stankeviciene@vgtu.lt*

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1. Introduction

Managers, as a part of this world have the mandatory necessity to be optimistic and to enclose optimism in every step of their career, even though frequently this bias can lead them to unfavourable outcomes (Heaton, 2002). Recently, economists have increasingly implemented psychology to their research. One of the most frequently used personal characteristics of human behaviour is the presence of optimism and overconfidence in corporate investment decision making. According to Langer and Roth (1975), Miller and Ross (1975) and Nisbett and Ross (1980) individuals tend to account their success basically on their own personal abilities and characteristics due to the presence of optimism, whilst success mainly is in fact accounted due to random events.

There have been several attempts to highlight the effect and impact of managerial hubris (Roll, 1986) and the phenomenon of optimism on corporate decision making. The effect on financing conditions on corporate behaviour has gathered a lot of attention in finance literature. Myers and Majluf (1984) display that when internal sources of finance are not enough for firms, they may reject valuable investment opportunities. Firms in the real world make investments based not only on the profitability of investment projects, but on the availability and costs of external financing. This theory that is opposed to the traditional theory of Modigliani and Miller (1958) who state that in a perfect market environment the investment decision making within a firm is only affected by the expected return and profitability of the investment, is thoroughly investigated in this study due to its implications on corporate investment decision making, this study's key field of analysis.

The presence of financing constraints is justified by the existence of the higher sensitivity of investment of firms to internal sources of financing (Fazzari et al., 1988; Carpenter and Petersen, 2002; Beck *et al.,* 2006). The literature focusing on financing constraints is basically grounded on the different measures of investment-cash flow sensitivity which is generally assumed to demonstrate financing constraints. The sensitivity, therefore, should display the degree to which a firm is relying on its internal funds in order to finance its investment projects.

However, following the adverse results of Kaplan and Zingales (1997), several studies review the investment-cash flow sensitivity test. The basic argument of their critiques is that higher investment-cash flow sensitivity cannot be justified by higher financing constraints due to the presence of non-monotonicity of investment-cash flow sensitivity. Financially successful firms too, may display high investment-cash flow sensitivity because they are systematically relying on internal sources of financing. Additionally, Ericson and Whited (2000), Alti (2003), and Bond *et al.* (2004) also argue that the cash flow contains already information regarding the firm's investment opportunities. Thus, the importance of the investment-cash flow sensitivity can provide additional information on the expected performance and

profitability of a firm, instead of providing information on the strictness of financing constraints.

2. Theoretical Background

2.1 Diversification and firm value

Berger and Ofek (1995) examine the diversification effect on firm value. Theoretical arguments recommend that diversification can result in either value enhancing or value destroying effects. Greater operating efficiency, greater debt capacity, and lower taxes may be some possible benefits when a firm operates in different lines of business. On the contrary, the use of increased discretionary resources in order to undertake value decreasing investments, and the phenomenon of cross subsidies which allow low performing segments to use resources of the high performing segments are some of the possible disadvantages of diversification. Therefore, they support the idea that there is no clear image regarding the positive and negative effects of diversification on firm value.

They use segment-level data in order to focus on the effect of diversification on firm value and to determine the possible sources of value gains or losses. The comparison of the imputed values of the segments of multi segment companies to the actual value of them leads them to the observation that diversified firms have values below the sum of the imputed values of their segments. The loss in value is, yet, significantly less for related diversifications.

Consistent with diversification activity is Berger and Ofek's (1995) theoretical justification developed during the late 1960s regarding the benefits of diversification. Evidently this trend has changed in the recent years. More recent theoretical arguments tend to support the costs of diversification. Chandler (1977) states that because multi segment firms create a pattern of specialised management, they are subsequently more efficient and, therefore, more profitable than focused firms. Weston (1970) suggests that liquidity allocation is more effective and more profitable for internal capital markets.

Berger and Ofek (1995) study the effects of diversification on firm value with the use of the measurement of each segment's value separately. As a result, they find that diversification indeed reduces value. This loss in value is found mainly for firms of all sizes, while it is reduced when the diversification is regarding related industries. They also find additional support regarding the fact that diversification reduces value because separate segments of diversified firms tend to display lower profitability than focused firms (Tachmatzidi, 2017; 2018).

An additional possible benefit of diversification stems from the combination of businesses with imperfectly correlated earnings. This effect has as a result diversified firms to gain higher debt capacity compared to focused firms of similar

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size (Lewellen, 1971). Increased debt capacity can create value by increasing interest tax shields. Therefore, diversified firms are supposed to have lower taxes and higher leverage. According to Majd and Myers (1987) focused firms face an important tax disadvantage because tax is attributed to the government in case of positive income; on the contrary in case of negative income the government is not obligated to attribute the difference to the firm. However, Majd and Myers (1987) predict that when one or more segments of a diversified firm face losses in some years, the firm should pay less in taxes compared to the taxes that should be paid if the segments of the firm were separate.

2.2 Finance constraints, diversification and corporate investment

In their seminal work Fazzari, Hubbard and Petersen (1988) try to address thoroughly the relationship between conventional models of investment and capital market imperfections referring to the access of individual firms to capital markets. Regarding mature firms with well-known prospects and capacities, conventional representative firm models in which financial framework appears not to be relevant to the investment decision may well be applied. Yet, for the rest of the firms, financial factors seem to be extremely relevant because external funds are not a perfect substitute for internal funds, especially when referring to the short run. On one hand when the cost disadvantage of external finance is small, withholding practices will display little or nothing regarding investment. Thus, firms will use external funds to support investment. On the other hand, when the cost disadvantage is major, firms which tend to invest more of their income may possibly have no low-cost sources of investment finance. Therefore, their investment will be affected by the fluctuations of cash flow.

Diversified firms are more efficient in allocating liquidity because they create a larger internal capital market. An alternative version of this argument belongs to Stulz (1990) who argues that the creation of larger capital markets from diversified firms leads to the reduction of under-investment problem that was also described earlier by Myers (1977). These internal capital market theories foresee that diversified firms overall make more positive net present value investments than they would as separate isolated segments. Additionally, Lang and Stulz (1994) show that Tobin's Q and firm diversification are negatively correlated, and consequently diversified firms tend to display lower Tobin's Q values compared to non-diversified firms.

Financial constraints in capital markets can underline the macroeconomic effect of fluctuations in investment to cash flow and liquidity which has as a result several firms to reduce their access to low-cost finance. In order to examine this aspect in detail, Fazzari *et al.* (1988) try to determine the magnitude of the effects of internal finance on investment. Most of the literature regarding the effects of tax policy on investment supposes that firms respond to prices set changes in securities markets,

like market interest rates and Tobin's Q, and that the availability of finance tend not to reduce investment (Hall and Jorgenson, 1967; Bower; 1970; Cummins *et al.,* 1994; Hassett and Hubbard, 2002). Therefore, the consequences for tax policy presuppose that marginal tax rate on returns for a new project is what really matters for investment. On the contrary, the firm's average tax load on returns from its investments does not play such an important role. However, regarding firms which turn to imperfect markets for external financing, not only cost of funds it is significant. For these firms, the proportion of earnings which is destined for taxes is significant for investment. Thus, the effects of cash flow on investment tax credit or depreciation may be of greater importance for several firms than the relative effects of cost of capital of such policies (Fazzari *et al.,* 1989).

The fact that tax rates are important for some firms, does not mean that there exists a policy opportunity. Additionally, agency issues remain an area of serious discussion. Policies that increase internal finance may drive managers to over-invest. However, the comprehension of the effects of public policies on investment through the procedure of internal financing can be relevant and important. An extension for further research regarding the financial influences on investment and information imperfections in capital markets implies that the examination of the accumulated information capital through financial intermediation is extremely significant in order to understand the process of investment decision making.

Financing constraints as well as corporate structure, liquidity and investment were also examined by Hoshi, Kashyap and Scharfstein (1991). They try to explore the empirical relationship between investment and corporate financial structure. Their analysis is based on the large theoretical literature which displays that information problems in the capital market can affect financial structure and investment. They focus and find evidence on the fact that liquidity as availability of internal funds could constitute a significant determinant of investment.

3. Methodology

3.1 Sample and data

The unique sample of Greek non-financial firms listed in the ASE was tested in order to produce useful results. These results may be extremely important for managers of Greek companies in order to overcome the difficulties they face. The narrow bounds for investment and rising of firms, the general financial crisis of public as well as private sectors, make the role of Greek managers much more difficult. Therefore, the firm sample is multi-faceted. It consists of firms from 11 different industries and sectors in order to incorporate the whole substance of optimism. The process is to exclude financial firms due to the differences in the way they compile their annual reports. Thus, the 184 non-financial sample firms will be the starting point for the research, in order to produce significant results and add to the existing knowledge on this subject.

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Data is gathered from the stock market as well as from balance sheets and cash flow statements for all firms of the sample. Focus is placed on every firm's annual report in order to gather all necessary data for the methodology. The next step is to classify stock prices on an everyday basis for all firms for the years from 2007 to 2012. Data is accessed from the ASE and is accumulated for every sample firm. Balance sheet data is necessary in order to formulate the basic variables that will be used in regression analysis. Balance sheet data is gathered from the web pages of all firms and is accumulated on an annual basis.

Basic regressions are run from 2005 to 2012 in order to have an analysis of the effects of managerial optimism on subsequent corporate investment, aiming to see if there is something special about the period of interest in terms of investing conditions. The main data source for stock price data is the ASE. ASE is the primary data source of studies that analyse corporate decisions in Greece.

Directors' dealings data is obtained from Directors Deals – Global Data & Analysis, a specialised global data market company which analyses and monitors all share transactions made by directors in the shares of their own company. Therefore, this work uses all the available data regarding the Greek case for the period of 6 years (2007 to 2012). During this period a total of 18,575 directors' dealings are reported. Because this study focuses on the transaction behaviour of individuals, all transactions that were executed by legal entities are excluded. The procedure is to maintain only the transactions that are described as buys or sells and exclude awards, contract buys, transfer ins and outs, transfers, div re, exercise, sale-post exercise, given away and subscribe.

3.2 Determinants of the excess value

The regression methodology involves running several regressions in order to examine whether managerial optimism is associated with inefficiencies which can lead to low market valuation of firms. The choice is to use excess value on a focused-firm "dummy" indicator as a dependent variable on several control variables as Berger and Ofek (1995) propose. Excess value of a company is the natural logarithm of the ratio of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed values of its segments, with each segment's imputed value being equal to the segment's sales multiplied by its industry median ratio of total capital (market value of equity plus book value of debt) to sales. More analytically, excess value EV_i and imputed value $I(V)_i$ of a company i, are defined as:

$$EV_i = \ln\left(\frac{V_i}{I(V)_i}\right), \text{ and} \tag{1}$$

$$I(V)_i = \sum_{j=1}^{n} \left(AI_{ij} \times \text{multiple of segment j of firm i} \right) \tag{2}$$

V = total capital (market value of equity plus book value of debt)
Multiple of segment j of firm i = median ratio of V to accounting item (sales ratio) of focused firms in industry of segment j
AI_{ij} = accounting item of segment j of firm i
n = number of segments of firm i

The independent variables are the natural logarithm of total assets, capital expenditures divided by sales, EBIT divided by sales, and managerial optimism "dummy" variable. The process was to first run a pooled OLS regression without the use of managerial optimism for the whole sample of the firms without separating the regressions accordingly to the three groups of managers (ALL, EB, and CEO). The pooled OLS regression model assumes that the coefficients are the same for all individuals.

The dependent variable is excess value on a focused-firm indicator as it was calculated previously. The independent variables of the regression are the natural logarithm of total assets, capital expenditures divided by sales, and EBIT divided by sales. Therefore, the regression equation that arises has the next form:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \varepsilon \tag{3}$$

Y = the values of the dependent variable (excess value on a focused-firm indicator)
X_1, X_2, X_3 = the values of the independent variables (the natural logarithm of total assets, capital expenditures divided by sales, and EBIT divided by sales)
b_0 = constant
b_1, b_2, b_3 = coefficients
ε = the error term

The next step is to run a series of fixed effects panel regressions. In regressions 4 to 9 the managerial optimism "dummy" variable is incorporated. Since there are "dummy" variables in the model there are n-1 entities included. However, there is only one "dummy" variable. Therefore, the regression equation for fixed effects panel regressions remains unchanged, as in pooled OLS regression equation that was presented above. The "dummy" variable is equal to 1 when members of the Executive Board and the Supervisory Board (ALL), only the Executive Board (EB), or only CEO are classified as optimistic in a given year. The managerial optimism "dummy" variable takes lagged values in the last three fixed effects panel regressions of the study for the determinants of excess value. These lagged values are also incorporated separately in order to compare the possible changes in last year's and current year's values.

4. Empirical Findings

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4.1 Managerial optimism and the determinants of excess value

Based on Glaser *et al.* (2008) this subsection demonstrates the possibility of the existence of a connection between managerial optimism and inefficiencies which leads to lower market valuation of firms. The main instrument is first a Pooled OLS regression. This regression model is chosen since there are panel data (both time series and cross section). All the data are put together, without making any distinction between cross section and time series. Therefore, running a regression over all the data using ordinary least squares, it leads to the use of Pooled OLS regression. It is the easiest to run and it is often used as simple benchmark to which more stilted regressions can be compared.

The dependent variable is excess value. According to Berger and Ofek (1995) the excess value of a firm is the natural logarithm of the ratio of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed values of its segments, with each segment's imputed value being equal to the segment's sales multiplied by its industry median ratio of total capital (market value of equity plus book value of debt) to sales. The actual value of a firm includes all aspects of the business in terms of both tangible and intangible assets (Table 1).

In regressions 2 and 3 the same regression is run first without the use of fixed effects and second with the use of year fixed effects. The observation made is that the indicators of profitability and firm size are significantly correlated to the excess value of the firm either with the use or not of the year fixed effects. The difference exists regarding the growth opportunities indicator, the ratio of EBIT to sales. Although its coefficient estimate remains at the same levels, there is no statistical significance between the control variable and excess value when fixed effects are run.

The next six regressions (4 to 9) present results when managerial optimism variable is controlled for with lagged values (regressions 7 to 9) or not (regressions 4 to 6) with the use of fixed effects. The results are similar with those presented in Berger and Ofek (1995) and Glaser and Muller (2010). Table 1 shows that the existence of diversification itself does not seem to be the reason for the diversification discount and the lower excess value of the firm. Also consistent with Villalonga (2004a; 2004b) this work finds that on average, diversification does not destroy the excess value of a firm.

Another observation is that there exists a negative statistically significant correlation between managerial optimism and excess value. The higher the managerial optimism, the lower the excess value. This result is in line with Glaser *et al.* (2008) and is found to be robust across all optimism measures. However, this result is not consistent with insider trading based on private information since managers are likely not to be correct with their expectations regarding their firm's performance.

As opposed to Glaser *et al.* (2008) the observation here is that lagged optimism variables maintain their statistical significance at either 1 per cent (ALL) or 5 per cent (EB and CEO). In line with Glaser *et al.* (2008) the stronger results with the highest coefficient estimates are encountered for the group of ALL managers. There, exists the stronger negative statistically significant relationship between managerial optimism and excess value.

To summarise the observation is that adjusted R-squared values of the models are stable and they explain almost 50 per cent of the outcomes of this model. Based on the related literature, low R-squared values are a common phenomenon and hence the values obtained in this work are accepted since the variables fit the expectations. Finally, it is important to underline the fact that in some firms' managers are biased. Often, these biased managers make decisions which end up being harmful for their firms. The overall findings in this study show that over-investment due to managerial optimism may serve as one possible explanation for the observed low excess value of firms. Yet, consistent with Glaser *et al.* (2008) all optimism measures are highly negatively correlated with excess value only where the link between optimism and corporate investment seems to be less strong. Therefore, managerial biases are likely to affect other corporate decision making to the damage of the firm.

Table 1 shows coefficient estimates from regressions of excess value on a focused-firm indicator and control variables such as in Berger and Ofek (1995). Excess value is the natural logarithm of the ration of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed values of its segments, with each segment's imputed value equal to the segment's sales multiplied by its industry median ratio of capital to that accounting item. Control variables are the natural logarithm of total assets, capital expenditures divided by sales, and EBIT divided by sales. In regressions 4 to 6 we include our optimism "dummy" variables. In regressions 7 to 9 we include lagged values of our optimism "dummy" variables. Regression 1 shows a pooled OLS regression, regression 2 is a fixed effects panel regression without year fixed effects. Regressions 3 to 9 show fixed effects panel regression with year fixed effects. Time period is 2007-2012. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cent.

Finally, a major difference is observed regarding the excess value of the sample firms. For highly constrained firms the excess value is significantly lower than for unconstrained firms. Negative values are observed for firms with high financial constraints compared to the positive values of firms with low and middle financial constraints. This can be explained in the way that the excess value of a firm is a combination of sales, capital, and actual value of a firm. Since, these variables are significantly lower for highly constrained firms, the excess value of these firms evidently will record negative scores.

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Table 1. *Determinants of the excess value*

Optimism based on				All	EB	CEO	All (Lagged)	EB (Lagged)	CEO (Lagged)
Type of regression	Pooled OLS	FE	FE	FE	FE	FE	FE	FE	FE
	1	2	3	4	5	6	7	8	9
Focused firm	0.748	0.054	0.055	0.051	0.054	0.055	0.055	0.045	0.051
	(0.000***)	(0.360)	(0.328)	(0.421)	(0.285)	(0.321)	(0.323)	(0.331)	(0.340)
Ln (total asset)	0.101	0.146	0.155	0.153	0.156	0.174	0.148	0.144	0.162
	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)
CAPEX/sales	0.003	0.590	0.359	0.382	0.390	0.631	0.207	0.001	0.001
	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.001***)	(0.230)	(0.244)
EBIT/sales	0.058	0.052	0.060	0.005	0.005	-0.003	0.096	0.013	0.038
	(0.002***)	(0.099*)	(0.120)	(0.122)	(0.118)	(0.089*)	(0.060*)	(0.437)	(0.164)
Managerial optimism				-0.047	-0.039	-0.031	-0.083	-0.022	-0.058
				(0.003***)	(0.009***)	(0.016**)	(0.003***)	(0.016**)	(0.013**)
Constant	-0.143	-0.225	-0.260	-0.224	-0.232	-0.234	-0.230	-0.238	-0.240
	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)
Year fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cases	1799	1799	1799	1799	1799	1799	1754	1754	1754
Firms	328	327	332	330	299	296	320	299	294
Adjusted R-squared	0.321	0.447	0.448	0.447	0.446	0.447	0.447	0.450	0.447

This table shows coefficient estimates from regressions of excess value on a focused-firm indicator and control variables such as in Berger and Ofek (1995). Excess value is the natural logarithm of the ration of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed values of its segments, with each segment's imputed value equal to the segment's sales multiplied by its industry median ratio of capital to that accounting item. Control variables are the natural logarithm of total assets, capital expenditures divided by sales, and EBIT divided by sales. In regressions 4 to 6 we include our optimism "dummy" variables. In regressions 7 to 9 we include lagged values of our optimism "dummy" variables. Regression 1 shows a pooled OLS regression, regression 2 is a fixed effects panel regression without year fixed effects. Regressions 3 to 9 show fixed effects panel regression with year fixed effects. Time period is 2007-2012. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cen

The interesting point of this analysis is regarding the excess value of the firms being analysed in the sample. Excess value for Whited-Wu-index (Whited and Wu, 2006) is the only descriptive statistic of the constraint terciles that does not exceed the excess value calculated by the Kaplan-Zingales-index (Kaplan and Zingales, 1997). This may be explained possibly because the Whited-Wu-index (Whited and Wu, 2006) is more affected by the low value of sales growth and industry sales growth. However, excess value still displays significantly lower values for financially constrained firms of the sample.

5. Conclusions

Over-investment is correlated to lower value for diversified firms, as well as the isolated segments of a diversified firm tend to over-invest more than focused firms. Their study is consistent with the evidence on the loss of value in firms which followed a diversification program during the 1980s. If over-investment as well as cross-subsidisation is correctly controlled, diversification is more likely to produce small benefits in regard to the higher debt capacity and tax savings.

Consistent with the results of Glaser *et al.* (2008) this work has also confirmed Research Question 2 too. Financially constrained firms compared to the whole sample of firms did not display high investment-cash flow sensitivities. Constrained firms when there are favourable investing opportunities, have the tendency to invest more. They tend to issue more debt in order to be able to finance these advantageous investing opportunities. Moreover, there was no strong evidence regarding optimism and CEOs' transactions. This work's findings did not justify the fact that a CEO plays a significant role in corporate firm performance. On the contrary, Glaser et al. (2008) have underlined that CEOs play a significant role in corporate decision making and consequently on firm performance although not only them are responsible for the performance of a firm. Glaser *et al.* (2008) have found that Supervisory Board members too along with the Executive Board members may play an important role regarding a firm's corporate decision-making policies and performance.

Therefore, in financially constrained firms, the investment-cash flow sensitivity with optimistic managers was more noticeable. The fact that a firm is financially constrained implies that optimistic managers affect cash flow of investment at a higher level than managers who are not optimistic. Again, optimism as a managerial cognitive characteristic played an important role in corporate investment decision making. This result confirms Kaplan and Zingales (1997), Cleary (1999), Cleary (2006), Glaser and Hirn (2007) and Glaser *et al.* (2008).

Finally, consistent with the results of Berger and Ofek (1995), Glaser and Muller (2007) and Glaser *et al.* (2008) this work investigated the impact of diversification and managerial optimism on the excess value of a firm too. First of all, it was found

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that the existence of diversification did not seem to rationalise the phenomenon of diversification discount and the lower excess value of the firm. Instead, managerial optimism significantly affected the excess value of the firm. More specifically, the higher the managerial optimism the lower the excess value of the firm. This can be justified because possible over-investment due to the existence of managerial optimism may constitute an explanation for the low excess value of firms.

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