According to Agency Theory and Neoclassical Theory; New Ownership and Diversity of Public Sector Companies in Corporate Life Cycle

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ABSTRACT

The purpose of this study is investigating and determining rate of seizing assets and acquisition other companies by public sector companies. We estimate this rate at various stages of the life cycle of the company. Therefore, according to their size and age, the companies have been divided into small, large, young, and mature groups, and for this purpose, we have collected data from a sample of 45 companies of the public sector from three Iranian provinces. We have tested our analyses from the viewpoints of agency and neoclassical theories and discussed the results of the independent t tests. The results showed that with increase in age and size, public sector companies are more likely to seize the fixed assets of other companies to restructure and achieve improved operations. However, in the case of assuming ownership of other companies done through buying the companies, most public sector companies do this in the middle of their lifetime and in the course of their growth.

1 Introduction

The existing opinions about the role of ownership and public sector companies' variability according to life cycle institutions offer two completely different perspectives. First agency theory predicts that institutions do acquisition through the destruction of wealth of the institutions and when they become

...ortunities and strengthen the management [15]. In contrast, neoclassical theory predicts that institutions follow acquisition for the best use of their scarce and valuable assets [12]. Because, of better performance, through acquisition and creation of new ownership, institutions create value that includes diversifying acquisition. Previous studies have shown that public sector companies that turn into public institutions perform better and are expected to acquire the assets that after becoming a public corporation have better use and provide easier access to foreign funds. Since public institutions in the public sector benefit from their growth opportunities, their rate of acquisition should be reduced. Finally, institu-

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tions with valuable and scarce assets acquire new assets, so that this scarce asset is optimally used. Therefore, both theories about corporate acquisition in the context of corporate ownership in the public sector and private sector forecast that the increase in the rate of acquisition and diversification in acquisition become more rapid by increase in age of the companies [1].

In this paper, we study the rate of acquisition of public sector institutions by other institutions of this sector, according to the life cycle of the institute and predict the amount of changes of the rate according to agency and neoclassical theories. There are several proofs available to support the prediction of neoclassical model. They denote that institutions with better performance and more growth opportunities conduct acquisition, and this acquisition can provide value. Instead, the only evidence consistent with agency theory is that stock price reaction to acquisition in old institutions in the public sector is negative. According to previous studies, the rate of acquisition in new institutions is more than the old institutions [1].

Evidence in previous studies examined in the neoclassical perspective shows a positive relationship between acquisition rate of the institution and its life. This means that the institutions use acquisition to allocate assets of the company to more productive uses. Institutions with long life and long history in the public sector are expected to have assets that are more valuable and pursue further acquisition. Regarding to this issue, Jovanovich and Rousseau [9] offered Tobin theory of integration. In this theory, the investment can be provided via capital expenditure and acquisition. Institutions with high Tobin rate perform more acquisition because they have more constructiveness and can transfer to the acquired institution. Therefore, based on Tobin's theory of integration, we expect the institutions with better performance to have more acquisition [19].

Jensen [8], research in this regard observed agency costs of the parent companies with a high rate and observed that parent companies and institutions with high liquidity are more likely to acquire [5]. While small businesses and the public sector have a positive reaction to acquisition, evidence for public acquisition of institutions in the public sector is combined. There are significant adverse reactions to acquisition of public institutions by older institutions, but these reactions are significantly similar to acquisition of young institutions. Market acts negatively to acquisition of the public institutions that turn into private sector institutions of Limited Liability Company (LLC). For the acquisition of LLC institutions with paying in cash, the market reacts positively to acquisition of the young institutions, but there is a significant negative reaction to the stock price for the acquisition by the older institutions. Stock price reaction to public acquisition announcements by mature institutions is consistent with theoretical predictions of agency theory, but the stock price reaction to announcements by private institutions and subsidiaries is not so. Agency theory lacks a convincing argument for this issue because acquisition of the public institutions can ruin the wealth due to brokerage fees. In contrast, information symmetry theory can explain why acquisition of the public institutions by payments in form of equity reduces stock price. It seems that the theory of information asymmetry, compared to the agency theory, can better explain the evidence because different predictions have been provided for the acquisition of public institutions and private institutions' acquisition [14].

2 Literature Review

Arikan and Stulz [1] examined the relationship between the ownership of companies, at the initial offering position, and their lifecycle. Their control variable was two different views that included agency and neo-classical theories. Results of their analysis showed that the company's life cycle affects the number and diversity of ownership of the company, and corporate structure based on two

theories at different phases of the life cycle makes a difference in the number of ownerships and affects the company's stock price. Thus, for a better understanding of the objectives and methodology of this study, first we examine the theoretical concepts used in this study. The study by Arikan and Stulz [1] showed that life cycle according to the age from the underwriting up to the age of drafting constitution has been effective. This evidence is consistent with previous studies that have suggested that turning into LLC leads to different acquisition rates, and perhaps it is because when underwriting to become LLC, companies improve access to external financing and can use their own stock as a method of financing. Moreover, government agencies acquisition rate to aggregate credit conditions is highly sensitive, as it is measured by extension of credit, which is defined as the difference between bond yields with high credit and bond yields with excellent credit. For new establishments, the expansion of credit is an important factor in determining the rate of acquisition in relation to Tobin coefficient [1].

Following Jensen [8], the literature has highlighted the agency costs of high cash holdings and finds that firms with high cash holdings are more likely to acquire. On the other hand, Agency theories of acquisitions and diversification have dramatically different implications from the neoclassical theories about the impact of acquisitions and diversification on shareholder wealth. Mulherin and Boone [20] study acquisition and divestiture activity from 1990 through 1999 of 1,305 Value Line firms. They find that both acquisitions and divestitures create wealth, which they measure by the combined stock price reaction to the announcement. An average target return of 20.2 percent in the three-day window around the acquisition offsets a slightly negative but insignificant bidder return. Mulherin and Boone find that combined bidder and target returns are significantly related to the relative value of the target (target value/bidder value). They conclude that the wealth effects are directly related to the size of the event for acquisitions (and divestitures) and are consistent with a synergistic explanation for the transactions. However value-maximizing decisions drive both asset purchases and sales. Decreasing returns to scale result in a one-to-one relation between profitability and the optimal size of the firm. Firms that grew rapidly when profitability was high could find themselves with too many assets when their profitability declines. These firms respond by shrinking their size toward the optimal through asset sales. The buyers benefit by obtaining assets at a relative discount. These transactions create value by reallocating assets from less profitable firms to more profitable firms. The participants split the surplus generated by the transaction [19].

Because of Arikan and Stulz [1] research, better-performing firms and firms with better growth opportunities create value through acquisitions, including diversifying acquisitions. To the extent that firms that go public are better performing firms, we would expect them to acquire those assets that they can make better use of after going public and having easier access to external finance. As newly, public firms exploit their growth opportunities, their acquisition rate should fall. Eventually, however, firms with valuable scarce assets may acquire new assets to keep making optimal use of these scarce assets, so that these theories predict both an increase in the acquisition rate and in diversifying acquisitions as firms age. According to Gomes and Livdan [4], firms diversify for two reasons. First, diversification allows firms to take advantage of economies of scope by eliminating redundancies across different activities and lowering fixed costs of production. Second, diversification allows a mature, slow-growing firm to explore attractive new productive opportunities. We sanctify this issue by assuming that production activities show declining returns to scale. As scale grows, returns decrease, eventually leading the firm to search for profit opportunities in new activities.

2.1 Agency Theory

According to agency theory, companies have valuable early growth opportunities in their lifetime. Company management improve the company beyond the level that can be extracted from existing growth opportunities for the company's growth. However, this is only possible if the resources are available for it [8]. Over time, the company's valuable growth opportunities reduce due to the company's use of its primary growth opportunities. At the same times, to increase their growth opportunities, the companies try to acquire of diversify it or purposefully do it for other benefits for management. Theories related to agency assess diversity as an efficient and sophisticated issue along with management of companies in different industries and have realized that diversity benefits management because it reduces uncertainty [2]. In addition, ownership enables the companies to maintain its growth, which gives management the ability to control resources more [15]. Diversity and ownership in large companies tend to offer more effects and higher bonuses for management and can enter the field of management [17]. Theories related to agency predict that large public and private sector institutions in the last stages of their life cycle, while tired of growth opportunities, gain diversity and new ownership of their business. Thus, agency theory predicts that when companies have weak growth opportunities and high cash flow, they look for opportunity and change [8]. According to agency theory, senior executives will benefit from the development of the company. If mature institutions have weak internal growth opportunities but high cash flow, they gain growth opportunities through diversification of acquisition. For this purpose, the quality of changes of the determinant acquisition factors and diversification over time and variability and life cycle of public sector institutions have been checked. Mature institutions in the public sector are more likely to have acquisition and diversification in high rates of Tobin, which is accepted in agency theory with difficulty, but consistent with neoclassical theories in variability such as those offered by Maksimovic and Phillips [12]. In their model, the rare and valuable asset of the institute is a talent asset for manager. When these talents can be used across different industries, it is better for the institution to have diversity and homogenize by products of management talent across the activities [1]. In addition, diversification is a natural result of firm growth and it stems from dynamic firm strategies that maximize value. Diversification allows a firm to explore new productive opportunities while taking advantage of synergies [4].

2.2 Neoclassical theory

Neoclassical viewpoint claims that corporate have rare and valuable assets that can be benefited from through ownership and diversity. Moreover, the companies that are committed to ownership are more valuable and managed better. This means that the company obtain high Tobin coefficient rate and higher rates lead to companies' obtaining more diversity in ownership [16]. Maksimovic and Phillips [12] proposed a model in which assets of the companies are rare and have a low rate of return on an industrial scale. Thus, companies invest desirably on other industries to maximize the value of their investment assets, and this is done when the investment has a rate of return higher than in other industries. Other models predict that the diversity can create shareholder value. A repeating claim is that diversity is a source of value because market inside a diversified company is able to make capital allocation more efficient. In return, if its sections were independent, it would force the company to have access to foreign markets [18]. Internal capital market enables the company to extract information whose transfer outside is problematic and enables investing on projects where foreign investment is difficult. Internal capital markets also make stopping activities that are not profitable for companies

easy and enable companies to reduce the impact of unexpected stock to validate its shares. A company with a diversity can use cash flows to invest in areas of growth by sectors in created areas to apply [10]. According to Arikan and Stulz [1] in neoclassical theories, acquisitions are made by better-performing firms and firms with better growth opportunities, and that acquisitions create value. Therefore, it is known that acquisition lead firm to value creation.

Another study shows that big public and private sector corporations may not recognize their competitive advantages exactly. They may keep assets they see valuable but are not sure how to make best use of these assets. In such a situation, a company may participate in different obsolescence activities and realize that others can adopt these activities more efficiently [13]. Gomes and Livdan [4] believe that the company creates diversification to benefit from the economic sphere, and as this issue enables mature companies with low growth to extract new profit opportunities, diversity is useful for them. Their model predicts that when firms reach perfection and maturity create a variety of acquisition and ownership compared to the time they were new. Neoclassical perspective predicts that firms with high Tobin factor invest in both capital expenditures and acquisitions through ownership. Thus, we expect companies with high Tobin coefficients to preserve asset that have a more fixed nature. A number of models argue that companies create different ownership when there is scarce asset. This goes so far that even though companies are more mature, assets become less productive [1].

3 Research Methodology

The main objective of this study is to investigate the relationship between acquisition in corporate ownership and diversity of public sector companies at different stages of the life cycle of companies. The study is done in perspective of agency and neoclassical theories. In this case, we determine that the acquisition of assets, other companies, and its rate during the life cycle of public sector companies will change. If the research question is answered and the relationship between variables is specified, one can achieve practical purposes. This means that we clarify for managers and owners of companies that at every stage of the life cycle, to what extent it is better to use acquisition, ownership of assets and companies, and to see variability. In this vein, Jovanovic and Rousseau [9] develop a q-theory of mergers. In their theory, investment can take place through capital expenditures as well as through acquisitions. High q firms make acquisitions because they have greater productivity that they can transfer to the acquired firm.

Previous studies have never assessed the public sector companies' behavior to seize assets and the acquisition of other companies in corporate ownership and diversity in the corporate life cycle stages. We want to determine what the rate of ownership of companies in the public sector in different stages of the life cycle is. This means that the difference between young and mature companies with respect to their views on the subject of acquisition is significant. Thus, the present study adds to the literature of accountancy that companies of public sector like private sector companies have different perspectives towards firm acquisition and ownership diversity and this difference with respect to their life cycle and agency and neoclassical theories has even more important differences. Previous research in the field of accounting and management accounting have done most of their reviews based on accounting data or market data, and this research is innovative in data collection and analysis and uses three categories of market data, accounting data, and questionnaire data in parallel and in a series of multiple statistical analyses.

In this study, two kinds of acquisition have been considered. The first is seizing the assets of a company by the main company, based on which the main company assumes only the asset and its control by paying for it, but in the second model, the main company assumes ownership or stock of the subsidiary company that leads to control. The former is called assets acquisition and the latter ownership acquisition of the subsidiary company. Closest to our model is the work of Maksimovic and Phillips [12], who first formalize the idea that diversification decisions can be understood as the optimal response of firms to industry or sectoral shocks. Using a static linear quadratic model, they show that firms will become conglomerates only when they face similar profit opportunities across sectors. Specialized firms, on the other hand, are usually much more productive in their chosen activities. Their paper also provides strong supporting evidence for this view. In their model conglomerates are valued at a premium relative to small specialized firms and at a discount relative to large specialized firms. However, they also assume that firms must incur extra costs when they produce in more than one industry [4].

According to literature and rely on agency theory and neoclassical theory, the study investigates to find out the whether or not the rate of acquisition and diversity in public sector companies changes significantly during their life cycle. In addition the differences in acquisition and diversity in public sector companies in line with agency and neoclassical theories is significant due to theories. Furthermore, the literature of corporate governance and the results of relevant research in anticipation of agency theory and neoclassical theory, show that the differences of view in public sector companies at different stages of their life cycle can be predicted by agency theory and neoclassical theory. The question is that how can agency theory and neoclassical theories predict these issues.

According to accountancy literature in company ownership, the results of the studies in the past about the views of companies of public and private sectors towards the acquisition of assets, acquisition of other companies, and the acceptance of diversity in acquired assets, we predict that the rates of ownership and acquisition in public sector companies change during their life cycle. Moreover, these companies' approach to diversity is variable along their lifecycle. Furthermore, this difference in views of companies can be explained and predicted by agency or neoclassical theory. Therefore, we develop a model based on companies' life cycle, and then assess the prediction of the two views. So:
• Hypothesis 1; the difference of small public sector companies with large companies in acquisition of assets is significant.
• Hypothesis 2; the difference of small public sector companies with large companies in acquisition other companies is significant.
• Hypothesis 3; the difference of young public sector companies with mature companies in acquisition of assets is significant.
• Hypothesis 4; the difference of young public sector companies with mature companies in acquisition other companies is significant.

Moreover, according to the literature and the results of relevant research in anticipation of agency theory and neoclassical theory, we predict that the differences of opinion in public sector companies at different stages of their life cycle can be predicted by agency theory and neoclassical theory. So:
• Hypothesis 5; the differences in rates of acquisition and diversity in public sector companies during the lifecycle with the predictions of agency theory is not significant.
• Hypothesis 6; the differences in rates of acquisition and diversity in public sector companies during the lifecycle with the predictions of neoclassical theory is not significant.

According to the study objective, which is examining the viewpoint of public sector companies towards ownership and acquisition of assets, it is necessary to use a series of reliable measures for our

analysis. With this aim, we collected information about the changes in the rate and type of assets discussed in public sector companies. Then we attempted to gather information on integration and acquisitions in a time series of 11 years in the public sector to collect the data of acquisition in public sector companies.

Thus, the period of ten years of research was considered from 2004 to 2014, and all official organizations under five ministries were considered as the population. Then, four offices from each ministry were appointed, and among them, we have sufficed to offices available and active. At the end, we have determined twelve different offices from three provinces of Golestan, Mazandaran, and Markazi Central randomly and made the overall population of the public sector as forty-five companies. Twenty-four companies of the sample were among large companies, eighteen companies were in mature companies' category, and the rest are young or small companies. It should be mentioned that we have obtained the measures for large and small scale companies from the financial statement and the balance sheet of assets, and maturity criterion is the company's life length. Table 1 shows the information on the sample and population.

Table 1: Frequency of Sample

	Young companies	Mature companies	Small companies	Big Companies
Golestan	6	4	4	4
Markazi	9	8	10	12
Mazandaran	12	6	7	8
Total	27	18	21	24

To obtain the data required for the acquisition of assets, we use the balance sheets of companies, and to collect data on the variability, we use archived data of the samples along with the questionnaire related to managers' information of the manner and extent of integration.

To test the hypothesis, first, we must consider the power of prediction of lifecycle model i.e. to consider whether the acquisition of the samples companies changes over time. To investigate this relationship, we use the average of corporate acquisition in certain the same group year. Focus on the same group average reduces the problem of the number of companies that acquire in a given year.

If we focus on the number of corporate acquisition when they are at a special age, we may have large or mature companies whose acquisition rate is high and dominate the entire sample.

In front of each year, groups of companies make acquisition, so the existence of these groups is not internal. We control group characteristics and economic conditions using fixed effects in the first part of the analysis.

This method is ideal for obtaining the effects of the life cycle. Using regression model and independent t-test where the independent variable is the number of a company's acquisition, we want to discuss whether the acquisition of small companies has significant differences with large companies, or whether young companies have differences in acquiring assets with mature companies.

For example, we examined whether the determinants of the acquisition of mature and young companies are different.

Either according to what is predicted by agency theory, the determinants of the decision to various acquisitions for young and mature companies are different or assessment of firm characteristics can explain the impact life cycle.

In this study, our index of the acquisition includes all the efforts of the sample companies that are

divided into two groups based on mediator variable. Acquiring another company is done regardless of being total or partial, public or private, or a subsidiary of other companies. Similar activities can be organized as a major public company or a subsidiary public company. This style of categorization and analysis has already been done in the case of private sector companies [3].

While the sample of acquisition of assets by large and small companies has a better reflection of the acquisition activity by a company, which is due to the inclusion of both full and partial acquisition, limited sample of control asset acquisition may provide a better indicator of how the company changes because of the acquisition.

Limited sub-sample is created thus: At first, we eliminate all the values that we cannot determine, so it is the major large firm that has created acquisition on fifty percent of assets of the other company. In this series, large and small companies, with less than fifty percent of the assets of the other companies are removed from sub-sample.

In this study, our index of the acquisition of other companies includes all the efforts of the sample companies that that have attempted to acquire other companies' stock or ownership and based on the mediator variable, the company size is divided into two categories. Acquiring the ownership of other companies is done, regardless of being total or partial, public or private, or a subsidiary of other companies. This style of categorization and analysis has already been done in the case of private sector companies [3].

The sample of acquisition of ownership of other companies by large and small companies has a better reflection of the acquisition activity by a company, which is due to the inclusion of both full and partial acquisition.

Thus, limited sample of acquiring of subsidiary companies by the main company may provide a better indicator of how the company changes because of the acquisition. Limited main sample is created thus: At first, we eliminate all the values that we cannot determine, so it is the major large firm that has created acquisition on fifty percent of the acquisition of the other company. In this series, large and small companies, with less than fifty percent of the ownership of the other companies are removed from main sample

. In this section, first, we compare the behavior of young and mature companies in acquisition and ownership of assets of public young and mature companies. We place the companies in the young companies' category that are in the first five full calendar years after their independence or formation, and assume the mature that are more than six years of age after their formation or independence. The average rate of acquisition provided for young companies mature. We form conditional average acquisition for young and mature companies by calculating averages across groups during the study period and then taking the average of the years intended for the duration of the studied period.

Limited sample only includes completed acquisition where a hundred percent of the ownership of an asset is acquired.

Age refers to the number of years passed since the independence or formation. Acquisition rate equals a known acquisition in the year divided by the number of companies that were active and public at the beginning of year. To test the hypotheses, the data is used in regression and independent t tests statistics mean t and z statistics used in the tests.

We examine the acquisition behavior of public sector companies according to their age in young and mature companies, but by studying the acquisition rate of other companies. Young and mature companies have the same classification of the past.

We form the full average rate of acquisition provided for young mature companies by calculating averages across groups during the study period and then taking the average of the years intended for the

duration of the studied period. Limited sample only includes completed acquisition where eighty percent of the ownership of a company is acquired.

In this part, we examine the acquisition of the conditional ownership of the companies in their lifecycle. Companies in one group consider the rate of conditional acquisition as the number of acquisitions during the study period. This measurement provides the average number of acquisition for each company in a group during the event. In this study. First year is the calendar year in which the public company forms and Second year is the first full calendar year of a public company. So far, we have focused on the number of acquisitions and acquisition of public companies in dual groupings.

The same number of acquisitions in different stages of company life could have different implications: for example, if in one year, the number of acquisition events is small and large in the next year; different evidence will be placed in the data set.

Therefore, ideally, we calculate acquisition rate over the life of a company separately for large and small, and then for young and mature companies.

In the following, we use the profile of the company to examine whether the determinants of the rate of various acquisition and ownership for young and mature companies are varied and whether these determinants support agency theory or neoclassical theory. To do this, we compare the statistical results obtained from the grouping of moderator variables of size and age of the company in terms of agency and neoclassical theories.

To examine the relationship between acquisition rate and company specifications, we estimate negative binomial models. In our regression, backward company profile is used, so there is no worry that acquisitions affect this profile. Previous research models have estimated comparative models study to examine the acquisition activity by young companies. Under this forecast, the neoclassical theorists that believe companies make the best use of their scarce valued assets, we will expect that better performing firms and companies with better growth opportunities, regardless of whether they are young or mature perform more acquisition. Conversely, if to offset its growth opportunities, the company acquires to meet the interests of managers, as predicted by theories of acquisition factors study, we expect the acquisition rate to be high when the rate of growth opportunities are lower and performance is weaker.

Here, we use two performance criteria of companies' stock return in the previous year and practical cash flow in the previous year that is defined as income from operations before deductions, taxes, and related expenses. For growth opportunities, we use Q-Tobin coefficient.

The three variables are commonly used in models that predict the behaviour of acquisition. Since the operating theories predict that firms with higher cash holdings acquire more, we determine the role of surplus cash holdings with short-term assets and cash divided by total assets minus mean of the industry [5].

4 Statistical Analysis Results

4.1 Tests related to the rate of acquisition of assets in large and small companies

In the first stage of the statistical tests, we used 11-year time series data from 2004 to 2014 for each of 45 companies in the sample to obtain the rate of acquisition of assets for the companies separately during the study period. In this test, the rate of acquisition of assets is the number of ads of acquisition

of assets declared by each company of the public sector done during the 11 years.

Then we classify and analysed the companies in ten distinct categories based on their size and the average asset values over the course of the study from one as the largest to ten as the smallest companies. Table 2 shows acquisition rate separately for ten categories of 45 companies in 11-year time in each t year.

Table 2: Rate of acquisition of assets of ten categories of public sector sample of 45 companies

Years	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group10
2004	0.0007	0.0026	0.1	0.0001	0.429784	0.98	0.000004	1.2	0.098	0.1
2005	0.490875	1.2	0.056	0.005463	0.98	1.2	0.1	0.98	0.98	0.056
2006	0.494734	0.98	0.98	0.378293	0.0054	0.98	0.056	1.2	1.2	0.98
2007	0.98	1.2	0.46	0.98	0.98	0.46	1.2	0.98	0.98	0.46
2008	0.0054	0.056	0.1	0.0026	1.8057	0.0001	1.000035	0.46	0.46	0.1
2009	0.98	1.2	0.1	1.2	1.0004	0.005463	0.46	0.1	0.1	0.0026
2010	0.441251	0.98	0.056	0.368392	0.727782	0.540832	0.0001	0.0007	0.056	0.056
2011	0.495283	0.98	1.2	0.98	0.0026	1.8057	0.005463	0.707134	1.2	0.98
2012	0.98	0.46	0.46	0.0026	1.2	1.0004	0.98	0.98	1.000035	0.46
2013	0.0054	1.034	0.1	1.2	0.98	0.774722	0.46	0.0054	0.023	0.1
2014	0.98	0.056	1.004	1.000035	1.0004	0.005463	0.00113	0.023	1.0004	0.0026
Average	0.532149	0.7407818	0.419636	0.556135	0.82837	0.704789	0.387521	0.603294	0.645221	0.299745

According to Table 2, the results of independent t-test conducted show that the acquisition rate differences between large and small companies in the time series is at the significant level 0.00234 (P<0.003). Therefore, the hypothesis that public sector companies have acted differently in terms of acquisition rate in their life cycle has been accepted.

Moreover, mean of the dependent variable in the regression of the first stage is equal to 0.43. Using OLS regression, in the first group, the acquisition rate increases at a rate of 0.01 per year.

In contrast, for a one to three-year public sector Company, one year reduces the rate of acquisition on average for 0.002.

Using the first stage regression, we can use average marginal multiplication effect of in variable standard deviation to estimate the economic effect of the variable. Continuing in the same way, the rate of asset acquisition with a standard deviation in year t, 0.017 acquisition rate increase is predicted in year $t +1$.

4.2 The tests assets acquisition test rates in mature and young companies

At this stage, the rate of regression of acquired assets in the 11-year time series for the eight categories of the sample companies based on their age grouped in eight categories are shown. Table 3 shows the rate of acquisition of assets for the public sector companies and Figure 2 is the charts of the changes.

According to Table 3, the results of independent t-test done, the difference between young and mature companies in acquisition of assets in time series is at significant level of 0.0014 (P<0.003). Thus, the hypothesis that public sector companies in terms of the acquisition rate during their life cycle and changes of their life have acted differently is accepted. The second stage regression reports OLS estimates of data of rates of ownership of assets separately for ages of companies. We cluster standard errors clustered at the level of the calendar year and company.

Table 3: Rate of Acquisition of Assets for the sample of 45 public sector companies in eight categories based on their ages

Year	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
2004	0.8365	0.0026	0.745	0.0098	0.098	0.98	0.000004	1.2
2005	1.2	1.2	0.198	0.056	0.0057	1.2	0.00465	0.98
2006	0.98	0.98	1.2	1.2	1.2	0.98	0.098786	1.2
2007	0.46	1.2	0.98	0.98	0.98	0.46	0.0026	0.98
2008	0.098786	0.098786	1.2	0.46	0.46	0.1	1.2	0.46
2009	0.0026	0.0026	0.98	1.034	0.1	0.056	0.98	0.1
2010	1.2	1.2	0.46	1.031	0.056	1.2	0.46	0.0007
2011	0.98	0.98	0.1	0.056	1.2	1.8057	0.0001	0.707134
2012	0.023	0.0054	0.0007	0.0096	1.000035	1.0004	0.005463	0.98
2013	1.000035	1.0004	0.005463	0.00113	0.023	0.864678	0.305734	0.0054
2014	0.98	0.056	0.0026	1.000035	1.0004	0.005463	0.00113	0.023
Average	0.705538	0.6114351	0.533797	0.530688	0.556649	0.786567	0.278042	0.603294

The advantage of using OLS is that we can achieve true fixed effects. From first and second stage regressions, it is inferred that the effects of life cycle of the company can be explained with features of the companies, and according to the prediction by the neoclassical model, large mature firms acquire more.

4.3 Tests related to the rate of acquisition of ownership of the companies in large and small companies

In the third phase, we have divided sample companies into ten categories based on their size so that we obtain the rate of acquisition of ownership of other companies through stock purchase separately over the course of the study.

In this test, the rate of acquisition of ownership of the companies is the number of ads of acquisition of ownership through stock purchase of more than fifty percent announced by material public companies and taken place during 11 years.

Table 4 and Figure 3 show the results of statistical data and the average of acquisition rate of the samples for 2004 to 2014 sample for 11 years related to 45 large and small companies of public sector.

The results of third regression analysis and independent t test show significant differences in acquisition ad of companies based on their size. As is seen, the averages reduce from big to small companies and at the significance level of 0.0083. Our test shows that confirmation of the hypothesis stating the existence of significant differences of the companies in acquisition of companies' stocks throughout the life cycle and based on their size ($p < 0.003$).

The third regression of Table 4 tests the existence of the effects of lifecycle effects at the time of control of company feature, economic conditions, and industry conditions.

Table 4: Rate of Acquisition of ownership in companies separately by size

Years	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group10
2004	0.8365	0.0026	0.745	0.0098	0.098	0.98	0.000004	1.2	0.098	0.1
2005	0.0001	0.5385765	0.1	0.056	0.0057	1.2	0.00465	0.98	0.0057	0.0007
2006	0.005463	0.98	0.0007	1.2	1.2	0.98	0.098786	1.2	1.2	0.355405
2007	0.46	1.2	0.725751	0.98	0.98	0.46	0.0026	0.98	0.98	0.98
2008	0.098786	0.098786	0.98	0.46	0.46	0.1	1.2	0.46	0.46	0.0054
2009	0.0026	0.0026	0.0054	1.034	0.1	0.056	0.98	0.1	0.1	0.023
2010	0.0007	1.2	1.2	0.98	0.098786	1.2	0.46	0.0007	0.056	1.2
2011	0.246681	0.98	0.98	0.46	0.0026	1.8057	0.0001	0.707134	1.2	0.98
2012	0.98	0.46	0.46	0.1	1.2	1.0004	0.005463	0.98	1.000035	0.46
2013	0.0054	1.034	0.1	0.056	0.98	0.864678	0.305734	0.0054	0.023	0.1
2014	0.98	0.056	0.0026	1.000035	1.0004	0.005463	0.00113	0.023	1.0004	0.056
Average	0.328748	0.5956875	0.481768	0.575985	0.556862	0.786567	0.278042	0.603294	0.556649	0.387319

We model the effects of lifecycle using regression squares relations (3) In Table 3.
The dependent variable is the number of acquisitions. Regression has negative coefficient on the size and positive coefficient on the square of the size.
Both of these coefficients are positive and significant. Thus, controlling the company features explains the life cycle effects.

4.4 Test related to ownership acquisition rate in young and mature companies

In the fourth stage, 45 sample companies are grouped in eight categories based on their life expectancy and the rate of acquisition of ownership of companies for public companies of samples are obtained and averages are calculated. Table 5 and Figure 4 show the results of the statistical analyses.

Table 5: Rate of acquisition of ownership of public sector companies separately for the company's life

Years	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
2004	0.46	0.0026	1.8057	0.0001	0.429784	0.98	0.000004	1.2
2005	0.1	1.2	1.0004	0.005463	0.98	1.2	0.0026	0.98
2006	0.056	0.98	0.983301	0.378293	0.0054	0.98	1.2	1.2
2007	0.46	1.2	1.093714	0.98	0.98	0.46	0.98	0.98
2008	0.1	0.056	0.46	0.0026	1.8057	0.0001	1.2	0.46
2009	0.0007	1.2	0.1	1.2	1.0004	0.005463	0.056	0.1
2010	0.219375	0.98	0.056	0.98	0.727782	0.540832	1.2	0.0007
2011	0.245672	0.98	0.98	0.46	0.0026	1.8057	0.98	0.707134
2012	0.98	0.46	0.46	0.1	1.2	1.0004	0.98	0.98
2013	0.0054	1.034	0.1	0.056	0.98	0.774722	0.46	0.0054
2014	0.98	0.056	0.0026	1.000035	1.0004	0.005463	0.00113	0.023
Average	0.327922	0.7407818	0.640156	0.469317	0.82837	0.704789	0.641794	0.603294

Fourth stage of regression analysis and independent statistical t-test show significant differences in terms of corporate acquisition ad based on life length in the company's life cycle.

As is seen, the means reduce from large companies to small ones and at significance level 0.0023, our test indicates the confirmation of the hypothesis of the existence of significant differences between the companies in acquiring stocks of other companies throughout the lifecycle and based on their age ($p<0.003$).

  The fourth regression of Table 5 tests the existence of the effects of lifecycle effects at the time of control of company feature, economic conditions, and industry conditions. We model the effects of lifecycle using regression squares relations (4) in Table 4.

The dependent variable is the number of acquisitions of stocks. Regression has negative coefficient on life length and positive coefficient on the square of the life length. Both of these coefficients are positive and significant. Thus, controlling the company features explains the life cycle effects.

4.5 Q-Tobin coefficient

  Q-Tobin test has been performed on the data of asset acquisition rate and ownership acquisition rate of companies on both firm size and life length in time series of 11 years of the study period. Mean Q-Tobin coefficient in the life cycle of companies in the public sector in time series of 2004 to 2014 is TQ_{t-1} coefficient that is as the quotient of the total price of the last stock or net asset value in year t-1 plus debt in t-1 on average total assets during the study.

Thus, we obtain average Q-Tobin coefficient for the 11-year period for all companies in the year t and show separately for firm size and life length of the company.

Table 6 shows the results of Tobin index test.

Table 6: Tobin Coefficients for asset acquisition rate and corporate ownership separately for moderating variables

Years	Large companies	Small companies	Mature companies	Young companies
2004	1.203	0.805	1.34	0.79
2005	1.34	0.658	1.046	0.8035
2006	0.99	1.004	1.004	0.9
2007	1.567	0.9034	0.9845	0.956
2008	1.73	0.805	0.8647	1.02
2009	1.308	1.00085	1.409	0.9102
2010	0.974	1.011	1.00001	0.8504
2011	0.8023	0.846	1.0985	0.9403
2012	1.0034	0.8057	0.8302	1.000006
2013	1.4092	1.2	0.9034	0.783
2014	1.094	0.921	1.077	0.8056
Q-Tobin MEAN	1.220081818	0.90545	1.050664545	0.887182364

As is seen, in 11-year time series, as the average rate Tobin has increased, companies have become larger and more mature and their acquisition rate increases as found in the previous analyses. Therefore, by the increase in acquisition rate, Tobin coefficient increases and this is a strong reason to reject the null hypothesis. These results also show us that, according to Tobin coefficients obtained, agency

theory is unable to predict the rate of corporate acquisition and assets, but this is consistent with the predictive power of the neoclassical theory claiming that by increase in Tobin rate of companies, asset acquisition and ownership of the companies increase.

Table 7: Summary of statistical results of testing research hypotheses

Hypothesis	Coefficient	S. D.	t-statistic	Size	Result
The difference of small and large companies in the public sector is significant in acquisition of assets	1.006	0.43	43	0.00025	Confirmed
The difference of small and large companies in the public sector is significant in acquisition of other companies	3.94	0.23	3.009	0.0001	Confirmed
The difference of young and mature companies in the public sector is significant in acquisition of assets	1.035	0.47	4.03	0.00034	Confirmed
The difference of young and mature companies in the public sector is significant in acquisition of other companies	1.23	0.605	2.09	0.000076	Confirmed
Acquisition rate differences and diversity in public sector companies during the lifecycle with the prediction of agency theory is not meaningful	0.09	0.2066	1.002	0.00036	Confirmed
Acquisition rate differences and diversity in public sector companies during the lifecycle with the prediction of neo-classical theory is not meaningful	0.802	0.234	1.205	0.28703	Rejected

5   Discussion and Conclusion

In the process of acquisition of assets and ownership rates of the companies during the life cycle of public sector companies, it is observed that a U shape is conceivable. The rate of acquisition at the beginning is a downward trend and when the company goes through its growth period, for more efficient use of assets and improving, they attempt to acquire ownership, assets, and the stock of other companies, and this is more evident in the high corporate life cycle. Explanation of the U form at the rate of acquisition is that older companies acquire for getting better growth opportunities because they have lost their opportunities to grow. This view shows that mature companies that have low growth and performance rate acquire more. Current evidence is not inconsistent with this view and when mature companies have higher return on investment, and q-Tobin, they do more acquisition. The remarkable thing is that the rate of acquisition of mature companies is almost as sensitive as young companies are to Tobin coefficient. It is obvious that the new companies have more abnormal returns than the old companies do, especially when they purchase state-owned companies with cash.

The same results also apply to subcontractors. In general, except for initial purchases of state-owned companies, abnormal returns are significantly positive. However, for purchasing of state-owned companies, abnormal returns are significantly negative, except for the new companies purchases paid with cash. Evidence of purchases of state-owned companies by old companies is in accordance with the predictions of agency models, but the evidence relating to mature public companies and subsidiary old companies is not thus. Agency theory difficulties in explaining the negative abnormal returns associated with purchases of state-owned companies are not negative purchases of public large and mature companies. If the management, due to management contradictions, does poor purchases, it is not specified why they only have weak purchases in purchasing government companies by young public companies on average.

In addition, we have fully shown that companies incur diversity are changing during their life cycle

and. As a result, the old companies have more diversified purchases than the new companies. The evidence supports the perspective of agency theory that executives use diversity to increase productivity when their companies are out of the route of growth opportunities. Neoclassical perspective suggests that companies purchase soon because they have high efficiency and therefore they must have more assets under control. During their lifecycle, companies acquire more when they have more growth opportunities.

However, corporate investment in public sector needs initiate their decisions to grow gradually or inorganically. Firms and corporates that request to grow quickly do so over acquisitions, and they targeting for gentler growth do so through internal investments. Further, firms downsize when they novelty themselves with excess assets. Acquisitions and asset sales are driven by selections over the scale of the corporate. Alternative theories that argue these decisions are driven by decisions over the choice of the firm include the dealings cost economics method, and the possessions rights method. Agency theory predicts that companies will have more purchase when they are old because they should replace growth opportunities and use their free cash flow to the benefit of managers. When we examine the determinants of purchases of old companies, we realize that these factors are very similar to factors with good performance factors and have good investment opportunities.

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