



Acquisition Targets prediction in the Egyptian Stock Market: New Empirical Evidence

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Abstract

Acquisition activity has become one of the most dominant processes in the corporate world to adapt with emerging market terms. As it is considered to be one of the most effective corporate restructuring methods and become an integral part of long term business strategy. Acquisition transactions have its influence on different stakeholders groups and thus, it is not surprising that it has drawn the academic research attention. This study aims to investigate the determinants that can predict target firms in the Egyptian stock market. An acquisition prediction model is created using logit regression and the sample includes 39 target (test sample) and 39 non-target firms (control sample) from 2005 to 2016. The empirical analysis finds only two from 6 variables that have significant influence on acquisition probability. It finds significant positive effect of liquidity as well as negative effect of P/E ratio on acquisition probability.

Keywords: acquisition; target firms; prediction model.

1. Introduction

Acquisition process means that one company buys the controlling ownership stake in another company while keeping their separate legal entities. In this situation, acquiring firm will be known as parent company and target entity as subsidiary firm [11].

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The acquiring company makes all the strategic decisions of the target company. If the acquiring company doesn't buy controlling stake of the target, it becomes minority shareholder and called non-controlling interest [27]. The Egyptian economy has undergone important structural transformation that had occurred within the preceding decade. Due to the economic reforms applied by Egyptian government since 1991 in the wake of globalization and economic liberalization policies. In a liberalized era, cost efficiency, core competence and increasing market share have become the concentration of every business. Consequently, this required corporations to expand and grow in promising businesses. A huge restructuring practice has been undertaken by leading companies to create a massive presence in their core areas of activity.

Acquisition processes as a new pattern in Egypt have not received a lot of attention in research since government regulations of acquisition came into effect in 1996. One interesting aspect of acquisition is prediction of which companies are probably to be acquired (targets) that would be of benefit for a company which is looking to keep independent since they may alter their financial characteristics and thus prevent acquisition. Furthermore, there is a possibility for individual investors to gain profit from knowing in advance which companies are probably to be acquired if they own the target firm shares prior to the acquisition attempt is announced. As acquiring companies pay premium when buying shares of target [15].

From academic side, most of empirical studies about motives behind acquisition transactions are from various developed countries. The number of acquisition deals is growing in emerging markets as a consequence of their usefulness as a corporate device to achieve strategic growth [31]. To the best of our knowledge, this study would be the first to examine the determinants that could predict target firms in the Egyptian stock market. Thus, it is expected that the findings of this study will be of massive use to academics to investigate issues surrounding the acquisition transactions in Egypt and will significantly contribute to the existing literature on acquisition activity in one of the most important emerging markets.

From practical side, determining targets' financial characteristics can be used to make detailed research on the likely target firms. Therefore, acquisition prediction would be used as a tool to reduce costs of search for acquiring companies and their advisors. Moreover, Reference [36] state that the successful classification of target companies through financial characteristics alone would be of interest for antitrust policy regulator. Since, they should be interested in target companies' financial profile. Thus, this study may assist regulators of antitrust policy because it would supply them with substantial information about financial attributes of targets in Egypt that would help them in restricting monopoly of strategic industries.

2. Research Problem

A big number of Egyptian companies have implemented acquisition deals since 1996 as the government regulations of acquisition executed at this year. The number of the firms that had been acquired during the period from 2005 to 2016 is 133 firms. The total value of all acquisition deals during this study period reached LE 276 billion. This encourages the researcher to investigate the motives behind acquisition transactions in the Egyptian market. The acquisition motives' theoretical review has highlighted the fact that acquisition decision is not depend on one single motive but rather on how well the intended acquisition could satisfy the different goals

that are set by involved parties. Therefore, the different financial characteristics of the targets are important motives to the acquirer in the selection process of which company to be acquired [2; 38]. Thus, it is necessary to investigate various financial characteristics of the target firms in Egypt which can offer valuable insights about what factors that motivate an acquirer to buy a specific firm.

Based on the above argument the main problem of this study can be represented in the following question:

-What are the financial characteristics of the target firms that can provide useful determinants for identifying those firms with a high probability of being acquired?

3. Research Objective

This study aims to investigate the determinants that can predict acquisition target firms in the Egyptian stock exchange.

4. Theories of Acquisition

4.1 Neoclassical theories

It is based on the assumption that firm's managers are rational and make the choices that maximize the wealth of shareholders. Thus, firm's business strategy that is in line with shareholder wealth maximization is considered as the rational for financing & investment decisions made by managers. This means that companies should engage in an investment when the present values sum of the future cash flows are more than the initial project costs [32].

Subsequently, from the acquirer's perspective in an acquisition transaction, the shareholder wealth maximization criterion is satisfied when the added value by acquiring a target firm exceeds the cost of acquisition which includes acquisition premium & transaction costs. Similarly, targets' managers would participate in an acquisition transaction only if it generates gains to its shareholders. This results in synergies that mean positive gains to target firm & acquirer [8]. Reference [10] states that proper synergies create value for shareholders through harvesting benefits from acquisition activity which they would not be able to earn on their own. Thus, managers who are considered as agents for shareholders should think in the same manner of shareholders to create value and make in detail analysis regarding potential synergy values.

From an operational & economical perspective on acquisition transactions, synergies can be created by integrating the operational resources of two firms if a strategic fit exists. Costs reduction can be attained through reductions in assets, economies of scope or economies of scale [46]. Revenue enhancement synergies are proposed to increase from marketing & sale point of view [54].

Acquisition transactions generate financial synergies to combined firms in terms of lower cost of capital or higher cash flows. Financial synergies would assist firms to decrease default risk. If a firm has likelihood to go bankrupt, creditors will consider this firm as a risky one and they may lend at a high interest rate or may not

want to supply capital for this firm [22]. By participating into an acquisition transaction with another solvent firm, the solvent firm would cover the decrease in other firm's cash flow. Consequently, the target firm may be protected from being default and protect creditors from suffering losses. As a result, the target firm will be seen as less risky [34]. Therefore, engagement in acquisition transactions would diversify equity risk for shareholders and decrease borrowing costs.

4.2 Behavioral theories

Managerial hubris theory is another theory explaining the motives of firms regarding engagement in acquisition transaction that is formulated by [52] which states that due to managers excessive self-confidence, they systematically commit error of optimism in estimating opportunities of acquisition transactions. The higher valuation of the target firm made by the acquirer compared to true value of target would not be made by rational acquirers.

Therefore, managerial motives are significant factors for the outcome of the acquisition transaction because managers may act to maximize their own interest and engage in empire building rather than value of shareholders [53]. Reference [50] note that managerial hubris is more likely to be found among low book to market ratio companies which are called glamour companies than among those which have high value of book to market ratio.

On the other hand, Reference [29] theory of free cash flow states that it is not overconfidence which leads to unproductive acquisition transactions but rather managers would invest the free cash flow in projects like acquisition with negative net present value if that would result in increasing personal benefits instead of maximizing shareholders value. These free cash flows that are generally found in the reserves should rather be paid to shareholders in the form of dividends if the firm is to be effective and to maximize price of the stock.

High levels of liquidity would lead to increase managerial discretion as suggested by Jensen which means that shareholders overconfidence in their managers to make rapid strategic decisions and to participate in big scale actions with little accountability or analysis, making it increasingly likely for managers to engage in poor acquisition transactions [33]. Furthermore, it is argued that the other stakeholders in the company will be more likely to provide management with the benefit of doubt in such cases and to accept acquisition plans based on subjective and ambiguous concepts such as managerial intuition and instincts depending on high past and current cash flows [50]. Therefore, like the hubris theory, the free cash flow theory suggests that otherwise well intentioned managers make wrong decisions not out of willfulness but rather simply due to that their decisions quality are less opposed than they could be in the absence of excess liquidity. Undoubtedly, as the degree of managerial discretion rises in free cash flow or in high market valuations as in the case of glamour companies which increases the opportunity for self interested managers to make self serving acquisition transactions [30].

5. Literature Review of determinants of targets prediction

5.1 Firm size

Reference [38] states that size is a vital explanatory variable in prediction of targets and smaller firms are more probably to be acquired than larger ones. As acquisition transactions have several size-related costs. For example, costs of competition with other bidders and costs accompanied acquired firm adaption to the acquirer's culture.

This hypothesis is supported by [61] who argues that the number of likely acquirers of a target company is declined with increasing size of the company since larger target companies demand larger acquiring companies with big resources to implement the deal. Also, larger targets may try to defend themselves that can be very costly for the acquirer in regard of transaction costs and actual price that will be paid for the target. Contrary to the theoretical and empirical expectations in the firm size hypothesis, Reference [57,42] find that acquisition likelihood is positively related to size of target firm. Reference [2,58] find insignificant relationship.

Consistent with firm size hypothesis, Reference [26,15] find negative relationship between target firm size and acquisition likelihood. Based on the above argument, the first hypothesis is as follow:

H.5.1: Smaller firms have higher probability of being taken over.

5.2 Inefficient management

It argues that inefficiently managed companies which its managers fail to maximize wealth of shareholders are more probably to be acquired [32]. If managers aren't utilizing assets to maximize their value, consequently, there is resources misallocation and acquisition is one of the methods through which assets can be reallocated to new managers who will make better utilization of firm's resources [38]. Acquiring inefficient firms (disciplinary acquisition) would be considered as a tool for punishing weak management and saving the interests of small shareholders. It has been suggested that acquisition transactions raise efficiency and shareholders' value by allocating more resources to optimum utilization [2].

This hypothesis is supported by [28] who states that both capital gains and increased dividends are available to an acquirer which can remove the inefficiencies made by management of target firm and benefit from value enhancing changes. This motivation for acquisition claims that companies which inefficiently managed are acquired by firms which its management teams believe that they can more efficiently utilize the firm assets [19]. On the other hand, [9,21] couldn't find support for this hypothesis.

Reference [14,39] find evidence supporting this hypothesis that profitability ratio as a proxy for inefficient management hypothesis has negative relationship with acquisition likelihood. Hence, according to the inefficient management hypothesis, it is expected that the propensity of being acquired increases with firms that have inefficient management.

H.5.2: Firms with inefficient management have a higher probability of being taken over.

5.3 Financial leverage hypothesis

This hypothesis contends that the probability of an acquisition transaction increases with a decline in firm debt [38]. Leverage measures how much resources are debt holders provide to owners of a firm. In a broad sense, it represents the debt financing option availability and use to the firm [45].

Companies with high unused debt capacity are considered as attractive targets since low leverage decreases default risk and raise debt capacity of the joint company [56]. Reference [18] finds evidence supporting this hypothesis that low ratio of debt can be regarded as a signal of incompetent management and possible acquirer can hope to raise value through getting extra debt when control is obtained. Contrary to the theoretical and empirical expectations in the financial leverage hypothesis, Reference [60] finds that target companies with greater debt levels have higher probability to be acquired. Reference [9,13] find insignificant effect for leverage motive on acquisition probability.

Financial leverage hypothesis is also supported by [7] who state that low leverage level raises the company probability to be acquired since low leverage ratio signal unused debt capacity that would be attractive to a possible acquirer as they can easily decrease its equity and raise its leverage ratio. Therefore as most studies confirm this negative relationship the following hypothesis can be formulated as follows:

H.5.3: Firms with lower leverage have a higher probability of being taken over.

5.4 Firm Liquidity

It states that the probability to be a target rises with an increase in liquidity of the [59]. Cash rich firms are appealing for acquisition as excess liquidity is desirable since it raises internal financial flexibility of the company. Furthermore, they are more able to respond to their industry risks and acquirer can better exploit opportunities in the market [55].

Reference [1] claims that high liquidity reflects short term solvency of the firm and the probability for management of acquirer to more efficiently use the excess cash. This agrees with the cash flow theory by [29] who looks at the agency conflict between management and shareholders. He shows that companies with resources which are in excess of that needed to fund their investment projects and have a positive net present value have greater probability of being acquired.

This hypothesis is supported by [44] who contend that firms that fail with strong cash flow and financial problems would be more difficult to sell it as a going concern since it is probably to be difficult to convince acquirers to take on these difficulties. On the contrary, Reference [26] find lower liquidity for target companies comparable to non target companies in Australia and also, Reference [9] find the same findings in the European Market.

Consistent with liquidity hypothesis, Reference [12,40] find that companies with higher liquidity have higher probability of being acquired. Based on the above argument, the next hypothesis is as follows:

H.5.4: Firms with higher liquidity have a higher probability of being taken over.

5.5 Asset undervaluation

This hypothesis states that companies with low market to book ratios are appealing for acquisition since they are regarded as undervalued. Because it implies that the firm underutilizes its assets therefore its stocks would be undervalued by the market [38].

The proponents of this hypothesis argue that companies with low market to book ratios are cheap deals [5]. Firms which hope to expand through acquisition should compare new investment cost with acquisition cost of an existing company and take the cheaper choice. In most situations, low valuation ratio is a signal for the acquiring firm that it is more economical to expand the business by acquiring the undervalued company than expanding through using internal investment [2]. On the other hand, Reference [49,58] can't find support for asset undervaluation hypothesis in UK market.

Reference [3,24] find evidence supporting this hypothesis that firms with lower market-to-book ratios are more likely to be target firms because they are cheap relative to their higher market-to-book counterparts. Therefore, it is expected from the above argument that undervalued firms will have higher probability to be acquired.

H.5.5: Firms with lower valuations have a higher probability of being taken over.

5.6 Price /Earnings Ratio

Price-earnings hypothesis is depending on the premise that companies with low price-earnings (P/E) ratios are more probably to be acquired. Since acquiring firms with high P/E ratios anticipate the market to evaluate the newly acquired earnings with the same high P/E ratio as before. This will lead to a capital gain to be achieved by the acquiring firm [38]. The P/E ratio is determined by dividing the market price of the share over the earnings per share (EPS) of the company.

Similarly, Reference [23,9] find significant evidence that the most common short term financial strategy is using acquisition processes as a device to enhance EPS through buying companies with lesser P/E ratios. Since a high P/E ratio in the target company implies that the acquirer could pay a high premium for the current earnings. Contrary to the theoretical and empirical expectations in the price earnings hypothesis, Reference [21] finds that firms with higher price/earnings ratios have higher probability to be acquired in European market. Reference [24] find insignificant effect for P/E ratios motive on acquisition probability in the French market.

In line with Price /Earning hypothesis, Reference [37] find that lower P/E ratios have positive effect on the acquisition likelihood in UK market. Thus, the last hypotheses can be formulated as follows:

H.5.6: Firms with lower P/E ratios have a higher probability of being taken over.

6. Research Methodology

6.1 Research variables and measurement

The following table summarizes the various hypotheses used in empirical studies on acquisition prediction; the respective variables used for their specification, their measurement and expected relationship.

Table 1: Summary of hypotheses and its respective variables

Variables		Empirical studies	Expected sign
Dependent variable			
Acquisition Probability	Dummy variable that take 1 if the firm is an acquisition targets and 0 for non-targets.	[24; 21]	
Independent variables			
Firm size	Market capitalization = no. of listed shares x stock price	[5; 13]	(-)
Inefficient management	Return on equity = Net income/Common equity	[38; 9]	(-)
Leverage	Leverage ratio= Total Debt/Total Assets	[13; 18]	(-)
Liquidity	Current ratio= Current assets/Current liabilities	[24; 21]	(+)
Undervaluation	Market/book ratio= Market value of equity/ Book value of equity	[38; 49]	(-)
Price/earnings	Price / earnings ratio= Price/Earnings per share	[23; 15]	(-)

6.2 Population & Sample

The population of the study consists of all firms listed on the Egyptian Stock Exchange (EGX). The study drawn two samples; test and control sample to investigate the determinants of targets prediction. Following [2] and [20], the initial test sample is constructed by identifying all firms from 2005 to 2016 that their controlling stakes have been acquired (set to be greater than 50% of the equity). According to the publications of the Egyptian Stock Exchange, there are 84 firms which more than 50% of its shares have been acquired by another firm. The sample must satisfy the following extra criteria:

- 1- Target firms' annual financial statements for the year prior to acquisition execution are available.
- 2- Banking and financial companies are excluded because they have different operating, financial and risk characteristics [38; 9].

This selection criteria creates a sample of 39 target firms. The second sample is constructed following other studies [4,5] for each target firm, a non-target firm (control sample) has been selected randomly from the population. Each control firm will be selected only once from the pool of firms that has not been acquired during

the twelve years of the study period. The control sample is similar to test sample in respect of their principal business activity (using the EGX industrial classification) and they have the same financial year-end to improve the prediction capability of the model [2; 44]. These matching procedures results in 39 target firms and 39 non-target firms. Target firms are coded (1) and non-target firms are coded (0) [24; 21].

6.3 Sources of data

Data required for the study include:

- 1- The record of all authorized acquisition transactions 2005 to 2016 is collected from the Egyptian Stock Exchange.
- 2- Financial statements of firms included in the sample of the study is collected from Egypt for information dissemination (EGID) company. All variables are measured as of the fiscal year end prior to the year of the acquisition execution.

6.4 Statistical Method`

6.4.1 Logit Regression

Following [57,13], logit regression model is used for testing determinants of targets prediction. It combines independent variables to estimate the probability that a particular event will occur. Thus, it is used to predict the probability that a firm will be acquired (target) or will not be acquired (non-target). As presented below, logit regression is used for testing the hypotheses:

$$ACQ = b_0 + b_1 SIZE_{t-1} + b_2 INEFF_{t-1} + b_3 LVG_{t-1} + b_4 LIQ_{t-1} + b_5 MTB_{t-1} + b_6 P/E_{t-1}$$

Where,

ACQ: represents acquisition probability. It equals (1) if firm is target and it equals to (0) if it is non-target.

SIZE: is market capitalization of the fiscal year end prior to the observation (acquisition transaction) year and also size is calculated as natural log of total assets at the end of the fiscal year prior to acquisition.

INEFF: is the return on equity of the fiscal year end prior to the observation year.

LVG: is the total debt to total assets of the fiscal year end prior to the observation year.

LIQ: is the current ratio of the fiscal year end prior to the observation year.

MTB: is the market to book ratio of the fiscal year end prior to the observation year.

P/E: is the price earnings ratio of the fiscal year end prior to the observation year.

7. Data analysis and research results

Some financial variables may have the ability to distinguish between two samples (Target and Non Target) as shown in the literature review. Table 2 lists a comparison of key variables between target and non target group. LIQ represents current ratio which is used as a measure for liquidity of company. The mean of target group is 4.03 and for non target group is 1.98. The difference is around 2. On the other hand, P/E ratio mean is much lower in the target group -2.74 than that of non target 23.23 and on average, P/E ratio accounts for 4.60 of target group and non target P/E ratio is about 8.80. The variables of SIZE, INEFF, LVG and MTB tell a different story as both groups have close mean and median values.

Table 2: Firm characteristics of target & non target groups

	Test sample (Target)		Matched (control sample) (Non Target)	
	Mean	Median	Mean	Median
N	39		39	
SIZE	18.816	18.352	19.110	18.873
INEFF	.146	.167	.136	.128
LVG	.451	.440	.426	.402
LIQ	4.036	1.516	1.983	1.400
MTB	2.187	.830	2.035	1.388
PE	-2.743	4.601	23.231	8.809

Table 3 presents the coefficient correlations among all variables in the logit reession to check whether there any correlations between these variables. Moreover, the table shows the Variance Inflation Factor (VIF) that checks whether there is multicollinearity in the residual of the results. All variables in the regression are not highly correlated and VIF for each variable is lower than 10, so multicollinearity should not be a concern here.

Table 3: Logit Regression Coefficient Matrix

Variables	SIZE	INEFF	LVG	LIQ	MTB	PE	VIF
SIZE	1	-.073	-.001	.037	.139	.173	1.053
INEFF	-.073	1	-.223	-.016	-.109	-.107	1.097
LVG	-.001	-.223	1	-.313**	.252*	-.246*	1.345
LIQ	.037	-.016	-.313**	1	-.075	.077	1.120
UNDER	.139	-.109	.252*	-.075	1	.035	1.099
P/E	.173	-.107	-.246*	.077	.035	1	1.136

** Correlation is significant at the 0.01 level.

* Correlation is significant at the 0.05 level.

Logit regression is used to estimate the determinants of targets. If it is target, the dependent variable ACQ is equal to 1 and if non target is equal to 0. Table 4 reports the results which indicate that liquidity is positively and significantly associated with the acquisition probability at the 5% level. Besides, there is a significant negative relationship between P/E ratio and the acquisition probability. Lower P/E ratio in the targets means that the acquiring firm would pay a lower price for the current earnings. Lastly, variables of size, inefficient management, leverage & undervaluation present an insignificant relationship with the acquisition probability.

Table 4: Logit model estimation

	<i>Coefficient</i>	<i>T-test</i>	<i>p-value</i>
SIZE	.070	.171	.679
INEFF	-.803	.425	.515
LVG	1.384	1.445	.228
LIQ	.452	5.521	.019
MTB	-.006	.292	.960
P/E	-.005	.002	.018
Constant	-2.509	.566	.452
R square	30.50		

This table reports coefficient for regressions of targets determinants as a function of some firm financial characteristics for all Egyptian firms in the sample (Target & Non Target) during the period from 2005 to 2016.

8. Discussion & Conclusion

8.1 Size hypothesis

Reference [38] argues that small companies have higher acquisition likelihood. Several prior studies have used this hypothesis and find inconsistent results. The size hypothesis is not supported by the findings of this study. This finding interprets some of the inconsistencies in past studies as some studies have found a negative relationship [61; 9]. Other studies have reported a positive relationship [35; 25] and an insignificant relationship [2; 58] between acquisition likelihood and size of the company. This diversity in the findings may be explained as these researches differently created their samples, sometimes concentrating on companies above a threshold size and in specific industries.

For example, Reference [38] concentrate on companies in mining and asset intensive manufacturing industries.

His sample is probably to be mainly consists of large companies (natural log of total assets). According to [38] result, acquisition is negatively related to size of company in the sector of large companies, Reference [9] limit their sample to include companies with market capitalization not less than one hundred million dollar. This restriction skews the sample also toward large companies and thus, the results. Consistent with [47; 58], no size restriction is putted on selection of the sample and the target firms are neither the largest nor the smallest ones on average in the sample.

8.2 Inefficient management hypothesis

The study results don't support this hypothesis, contrary to [38; 4; 48] findings. The absence of hostile acquisitions would interpret that most Egyptian acquisition strategies are not disciplinary ones. Most of acquisition transactions present sectoral similarity (target /bidder) and concentration of ownership largely illustrates the absence of hostile acquisitions. This finding is in line with the results of [24] in the French market and [9; 21] in the European market.

8.3 Leverage hypothesis

This study finds insignificant effect for leverage motive which is consistent with the results of [16; 9; 13]. This finding can be explained by [16] who argued that some ratios differ across industries. Thus, using ratios calculated from various industries would influence results from statistical procedures. For instance, if an industry is attributed by high leverage, this does not mean that none of the companies in the industry are applicable to be targets. Actually, a highly leveraged company may have relatively low leverage if it is compared to the industry norm. In addition, [43] argues that if industry relative ratios have been used, the financial ratios distribution may be closer to normality.

8.4 Liquidity hypothesis

This study confirms liquidity hypothesis as the results shows positive relationship between liquidity and acquisition probability in the Egyptian market. This finding is constant with the findings of many studies. For instance, Reference [41; 62] in UK market and [18] in Turkish market.

8.5 Undervaluation hypothesis

This hypothesis argues that companies which are undervalued will have greater acquisition probability. Similar to prior UK studies [49; 58], this research can't support this hypothesis when company undervaluation is proxied by the M/B ratio. Most of past literature uses M/B ratio as a measure of company undervaluation overvaluation or misvaluation.

As stated by [17], to the extent to which book value of equity measures the value of a company, any difference between equity's book and market values would capture the market's efficiency in evaluating the company. This states that M/B ratios of 1 imply correct evaluation and any variation from this value would suggest misevaluation. In line with prior studies, the M/B ratio is employed to proxy for company undervaluation in this

research.

However, M/B ratio is used as the main measure of undervaluation in prior acquisition prediction literature; it is worth reporting that M/B ratio is likely not the most appropriate proxy for undervaluation. Other improved undervaluation measures such as decomposed M/B ratio might improve results of this hypothesis [51; 58].

8.6 Price earnings hypothesis

Consistent with price earnings hypothesis, the results of this study finds negative and significant relationship between P/E ratio of companies and probability to be acquired. This finding is in line with those of [9] in the European market and [37] in UK market.

In summary, only liquidity and price earnings hypotheses are supported to differentiate between target firms and non target firms in the Egyptian market. In addition, the explanatory power of model sounds to be small ($R^2=30.50\%$). This would be related to the fact that acquisition motives imply that this process includes human behavior factors. This due to human behavior evolves and changes over time, it could be hard to predict this behavior and consequently, it could be hard to explore behavioral elements which related to acquisition motives [9].

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