

The effect of mergers and acquisitions on companies' fundamental values in emerging capital markets (the case of BRICS)

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The study is aimed at the assessment of the effect of mergers and acquisitions on the fundamental value of acquiring companies in BRICS countries. The approach based on the residual income model was applied. The pre-acquisition expected fundamental value of the acquiring company and its realized post-acquisition fundamental value are compared.

The study is fulfilled on the sample of 366 M&A deals in BRICS countries, collected from Zephyr, Bloomberg and Thompson Reuters databases. Econometric modeling is applied to reveal factors causing the value creation or destruction among which there were the company's size, the mode of deal funding, the industrial specifics and the method of payment.

Mergers and acquisitions; emerging capital markets; BRICS countries; fundamental value; residual income valuation model.

1. Introduction

Mergers and acquisitions (M&A) are actively being discussed in the academic literature. In these deals, the emerging markets have become a major centre of activity. Currently, companies from emerging markets are involved in every fourth merger or acquisition. The ultimate leader is China; Brazil holds the 3rd place in the ranking of the most active countries, Russia is the 4th. Among the countries with the most attractive targets India (3%) has the same rate as the USA. As for acquirers, a lot of them are also allocated at the emerging capital markets.

From the standpoint of companies initiating M&A, it is crucially important to answer the question whether the net present value of a deal is positive? In this case, the fundamental value of the deal is expected to increase, to the benefit of the shareholders of the acquiring company.

In this paper, the approach based on the residual income model (Residual Income Valuation - RIV) is used to evaluate the effect of M&A on companies' fundamental value. In addition, an econometric analysis of deals' characteristics, affecting the creation or destruction of the fundamental value, is performed.

Thus, the aim of this study is to analyze the effect of mergers and acquisitions on fundamental values of acquiring companies in emerging capital markets. The paper is organized as follows: we provide a literature review related to the research problem and develops hypotheses to test. The third part describes the research methodology and data sampling. At the next part we discuss the results hypotheses testing. In the conclusion the contribution of the research to theory and its managerial implications are discussed.

2. Literature Review

The basis of the RIV model is developed by Ohlson (1995) on the assumption that the fundamental value of a company's equity consists of two components: the book value of equity at the time of the valuation and the discounted flow of residual incomes, which provide the surplus between the fundamental value and the book value of equity.

In (Dechow et. al, 1999) the RIV model was analyzed in terms of its practical implication. Comparing the RIV model with other valuation models, the authors praised its potential for future empirical research. Ferreira et al. (2008) explored the behavior of the three valuation models - the residual income model (RIV), the abnormal earnings growth model (AEG) and the free cash flow model (FCF) – for companies traded at BOVESPA, at 1995 - 2002. The authors conclude that the RIV model had the greatest explanatory power for the period from 1995 to 1999, which could be explained by special features of the Brazilian stock market, with its heavily regulated accountancy, the high rate of concentration at capital markets and prevailing of bank loans as the main source of financing. When in 2000 the market has changed, there was an inflow of companies traded at BOVESPA, and the AEG model has become equal to the RIV model. The FCF was the least productive.

The high explanatory power of the RIV model was confirmed by other studies. Thus, Frankel and Lee (1998) reported that estimates obtained on the base of the RIV model explain more than 70 % of variation of the spatial data. Since the model determines the company's value with such indicators as the book value of equity, net income, and the amount of dividends, the explanatory power of these variables is also very important. The regression constructed for these variables in (Hand, Landsman, 1998) had the R^2 over 80 %. Volkov and Berezinets (2006) tested the accuracy of equity valuation models based on accounting

indicators at a sample of Russian companies in 2000-2005 and argued for the reliability and high explanatory power of the RIV model.

Buhvalov and Akulaeva (2014) made an attempt to search an estimation model for Russian companies, suitable for most sectors of the economy. The authors propose a modification of the RIV model and report the results of its application to Russian companies for 2011 - 2013. They conclude that the fundamental value of companies better corresponds to their strategic value than their market capitalization observed.

Concerning the studies of M&A in emerging capital markets, academics provide controversial results. For India, Mantravadi and Reddy (2008) reported that for the period of 1991 – 2003 these deals led to a slight profitability increase in the financial and banking sectors, while the pharmaceutical, textile and electrical industries were faced with a reduction in operating margins and return on investment. In the chemical and agricultural industries M&A led to a significant decline in both operating margin and return on investment. From the other hand, Rani, Yadav and Jain (2014), who had analyzed the impact of domestic and international mergers and acquisitions on the performance of acquiring companies in the period of 2003-2008, reported that both types of transactions led to an increase in the performance, but the abnormal return of international deals was higher than of domestic ones.

Wong et al (2009) explored the abnormal return of M&A in the Hong Kong, China, Taiwan, Singapore, South Korea and Japan in 2000 - 2007 before, during and after the announcement of the deal. They revealed that in the short-term period information on the deal had a positive impact on share prices. The similar conclusion was made by Chi et al. (2011) on the sample of 1148 deals of Chinese companies for 1998-2003.

Ivashkovskaya, Shamraeva and Grigoriadi (2009) tested the hypothesis on the positive influence of corporate diversification at the company's value at a sample of Brazilian, Russian, Indian and Chinese companies. Results of the study allow to ascertain the prevalence of positive effects on corporate diversification, which confirms the first hypothesis put forward by the authors, that diversification does not lead to the destruction of value.

In an empirical study of the financial sector in BRICS countries Grigorieva and Grinchenko (2013) analyzed the impact of M&A on the value of target companies. In 2000 – 2012 the positive effect of these deals on the value of target companies was confirmed for a short-term time horizon for companies in Brazil, India, China and South Africa. As for the Russian deals, effect was negative. The authors also identified determinants of M&A effectiveness, which were roughly similar for all the countries of BRICS: method of payment, the size of the deal, the presence of intangibles from the acquiring company, experience in M&A and the countries' specifics.

Grigorieva and Troickiy (2012) used an approach based on the financial reportings to evaluate the impact of M&A at the operating efficiency of companies of BRIC countries in 2005-2009 and identified the growth of operating performance (EBITDA / Sales) in two years after the deal completion. Grigorieva and Petrunina (2013) have used both approaches: short-term assessment was conducted by event study, and long-term one - on the basis of the financial statements. Having analyzed 80 deals in emerging capital markets in 2002-2009, they concluded that deals destroyed values of target companies.

Despite some differences in the results, in general, researchers have come to conclusion that M&A have a positive impact at the company's value. In accordance with these conclusions we develop *our hypotheses*.

H1. Mergers and acquisitions in BRICS countries lead to the growth of their fundamental value.

H2. International mergers and acquisitions lead to greater growth of a company's fundamental value of the company than domestic deals.

H3. The size of the acquiring company has a negative impact on the effect on the fundamental value of the company as a result of M&As. Considering economies of scale, it is assumed that smaller acquirer should more benefit from the deal, than larger companies. In addition, smaller target company, the easier to an acquirer is to integrate it into its activities.

H4. The deal size affects negatively at the effect on the fundamental value of the company. It is assumed that the costs of large deals lead to a reduction in the financial and operating performance of the acquirer, which affects negatively on its fundamental value.

H5. Type of transaction has an impact at the fundamental value of the acquiring company.

H6. Type of financial transaction has an impact at the fundamental value of the acquiring company.

H7. Deal payment in cash has a positive effect on the fundamental value of the acquired companies. It is assumed that, in comparison with payment transactions via debt and equity transactions, payments in cash are easier to perform that helps to improve a company's financial performance.

H8. Deal payments via debt or shares lead to the destruction of the fundamental value of the acquirers.

H9. Deal payments with deferred payments or earn-outs lead to the creation of the acquirers' fundamental value. It is expected that such payments reduce the risk of adverse selection, because the second part of the payment depends on the operating results of target companies.

H10. The industry affiliation has an impact on the fundamental value of the acquirer.

3. Methodology and Data Sampling

The impact of M&A deal at the company's fundamental value is determined with the difference between the expected fundamental value of the acquirer before the deal (pre-acquisition expected fundamental value) and a fundamental value of the company after the transaction (realized post-acquisition fundamental value). The basic model for the study is the residual income valuation model (RIV). The fundamental value is the present value of the expected dividend payments:

$$V_t = \sum_{i=1}^{\infty} \frac{E_t[D_{t+i}]}{(1+r_e)^i}, \quad (1)$$

where V_t is the fundamental value of equity at the moment t , $E_t[\cdot]$ is the expected mean based on information available at moment t , D_{t+i} – dividend payments at $t+i$, r_e denotes the cost of equity.

Changes in the book value of equity are reflected in the financial statements as follows:

$$B_t = B_{t-1} + NI_t - D_t, \quad (2)$$

where B_t , B_{t-1} is the book value of equity in periods t and $t-1$, NI_t denotes the net income at t , D_t denotes dividend payments at t .

By combining expressions (1) and (2), we obtain the following equation:

$$V_t = B_t + \sum_{i=1}^{\infty} \frac{E_t[NI_{t+i} - r_e \times B_{t+i-1}]}{(1+r_e)^i} - \frac{E_t[B_{t+\infty}]}{(1+r_e)^\infty}. \quad (3)$$

It is assumed that the last part of the equation (3) equals to zero. The second term of the equation is the present value of future residual incomes. Thus, the fundamental value is the sum of the book value of equity and present value of future residual incomes:

$$V_t = B_t + \sum_{i=1}^{\infty} \frac{E_t[NI_{t+i} - r_e \times B_{t+i-1}]}{(1+r_e)^i} \quad (4)$$

For practical application, equation (4) requires a time horizon, based on the assumption on a terminal value. To do this, we modify the model as follows:

$$V_t = B_t + \sum_{i=1}^{\infty} \frac{E_t[NI_{t+i} - r_e \times B_{t+i-1}]}{(1+r_e)^i} + \frac{E_{t+T}[NI_{t+T} - r_e \times B_{t+T-1}]}{(1+r_e)^{i+T-1} \times r_e} \quad (5)$$

The evaluation of the impact of a merger or acquisition at the fundamental value is based on the equation (5). For the forecast period, four reporting periods from the date of the transaction were assumed. To obtain the fundamental value of the acquiring company after the deal (V_{post}), equation (5) has been modified as follows:

$$V_{post} = B_{-1} + \frac{NI_0 - r_e \times B_{-1}}{(1+r_e)} + \frac{NI_1 - r_e \times B_0}{(1+r_e)^2} + \frac{NI_2 - r_e \times B_1}{(1+r_e)^3} + \frac{NI_3 - r_e \times B_2}{(1+r_e)^3 \times r_e} \quad (6)$$

The first term represents the value of equity in the period -1, the last accounting period before the merger. Period 0 is the year of companies' consolidation, the first reporting period after the transaction. The fifth term describes a terminal value, which equals to the excess profits of period 3, discounted at infinity.

M&A are often accompanied by the issue of new shares for the shareholders of the target company. Issue of new shares may increase the total company's fundamental value while reducing the fundamental value of a share. Thus, for more reliable results it is reasonable to focus on the impact of the deal at the fundamental value per share as follows:

$$V_{post} = B_{-1} + \frac{EPS_0 - r_e \times BPS_{-1}}{(1+r_e)} + \frac{EPS_1 - r_e \times BPS_0}{(1+r_e)^2} + \frac{EPS_2 - r_e \times BPS_1}{(1+r_e)^3} + \frac{EPS_3 - r_e \times BPS_2}{(1+r_e)^3 \times r_e} \quad (7)$$

where BPS denotes the book value of equity per share, EPS are net earnings per share.

To avoid dirty surplus effects in defining the company's fundamental value after the deal, the first and second terms of the equation (7) are later replaced with the book value and dividends (dividends per share, DPS) for period 0 (Penman, 2007):

$$V_{post} = \frac{DPS_0}{(1+r_e)} + \frac{BPS_0}{(1+r_e)} + \frac{EPS_1 - r_e \times BPS_0}{(1+r_e)^2} + \frac{EPS_2 - r_e \times BPS_1}{(1+r_e)^3} + \frac{EPS_3 - r_e \times BPS_2}{(1+r_e)^3 \times r_e} \quad (8)$$

To calculate the pre-acquisition expected fundamental value, we construct the same components as in equation (8) for the year prior to the transaction (-1):

$$V_{pre} = \frac{E_{-1}(DPS_0)}{(1+r_e)} + \frac{E_{-1}(BPS_0)}{(1+r_e)} + \frac{E_{-1}(EPS_1 - r_e \times BPS_0)}{(1+r_e)^2} + \frac{E_{-1}(EPS_2 - r_e \times BPS_1)}{(1+r_e)^3} + \frac{E_{-1}(EPS_3 - r_e \times BPS_2)}{(1+r_e)^3 \times r_e} \quad (9)$$

Expectations in the equation (9) are based on the assumption of the absence of the deal (or lack of information on it). Comparison of equations (8) and (9) provides an estimate of the impact of M&A at the fundamental value per share of the acquiring company:

$$\Delta V = V_{post} - V_{pre} \quad (10)$$

To make this assessment comparable for different companies use the percentage increase in value is used as follows:

$$\% \Delta V = \frac{(V_{post} - V_{pre})}{V_{pre}} \quad (11)$$

For valuation of the pre-acquisition value future earnings per share (EPS) were calculated by multiplying the forecast of return on equity (ROE) at the predicted value of the book value of equity per share (BPS) at the beginning of the year for each future period. For a forecast of ROE an average ROE of the acquiring company in period from -3 to -1 were used (Frankel, Lee, 1998).

The book value of equity per share for the period 0 is calculated as the book value of equity per share for the period -1, added to the predicted value of EPS and diminished at expected dividends of the period 0. Similar calculations are made for other periods.

For calculation of future dividends per share the expected value of EPS is multiplied at the expected dividend payout ratio. Dividend payout ratio is calculated as the average of dividend payout ratios for periods from -3 to -1. The period where the income is negative is excluded from the calculations. If the company carries losses at all pre-acquisition periods or if the predicted value of EPS is negative, it is assumed that future dividends equal to dividends for period -1.

As the cost of equity (r_e) we used a time-varying discount rate for every company calculated on the base of the CAPM. To reflect the specifics of emerging capital markets, the country risk premium was calculated in accordance with the approach proposed by Damodaran (2009). As the risk-free rate of return the US Treasury bonds were applied. The cost of capital calculated for the period -1, is used to calculate the expected pre-acquisition fundamental value, whereas for the calculation of the post-acquisition fundamental value the average value r_e for periods 0-3 is considered.

If the terminal value is negative, it is replaced by a null value. If acquirers cease their existence within four years after the transaction, then the year of "death" is taken for the final period of the analysis.

For data sampling database Zephyr (Bureau van Dijk) was used. To collect financial information on companies, databases Thomson Reuters Advanced Analytics and Bloomberg were used, as well as financial statements of the analyzed companies. The sample included deals completed from January 2009 to March 2012. For the formation of the final sample following criteria were used: acquirers should be public companies whose shares are listed on the stock exchange. We considered only completed deals with the minimum size of USD 100 million. The sample included 473 deals but, due to the absence of some data, it was reduced. The groups of deals made by acquirers in the short term (up to 1 month) have been combined and further treated as a single deal. The final sample consists of 366 deals (Fig. 1).

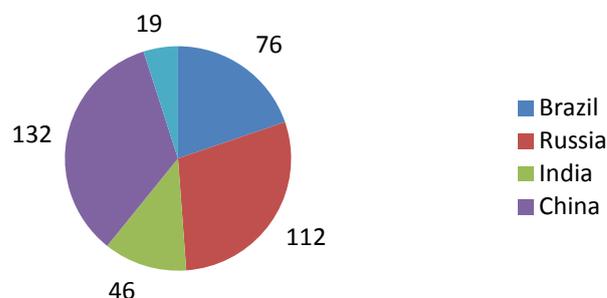


Fig. 1. Distribution of deals in the sample according to their countries

4. Results and Discussion

Table 1 demonstrates the results of calculating the effect of deals on the fundamental value per share: the positive effect of the transaction at $\Delta V > 0$, and a negative effect at $\Delta V < 0$.

As a result, of 366 analyzed deals, 295 (80%) led to an increase of fundamental value per share, while 71 deal led to the destruction of the value. Thus, the hypothesis 1 of this study cannot be rejected.

To assess the influence of various characteristics of the deal at its effect expressed by ΔV (equation 10) the following regression equation was estimated by OLS:

$$\text{difinvalue} = \beta X_i + \varepsilon_i, \quad (12)$$

where ΔV is the dependent variable, calculated value of the difference between the fundamental value per share of the acquirer before and after the deal i , β denotes the vector of parameters; X_i is the vector of independent variables, characterizing the deal i ; ε_i is the model error. A complete list and description of the variables is presented in Appendix.

Table 1

The deal effect on acquirers' fundamental value

Country	Total number of deals	Positive effect ($\Delta V > 0$)	Negative effect ($\Delta V < 0$)
Brazil	76	57	19
Russia	97	76	21
India	46	38	8
China	128	106	22
South Africa	19	18	1
Total	366	295	71

Despite the presence of significant factors in the OLS-model, its effectiveness is dubious. First, the dependent variable of the model cannot be compared for different companies and different deals, due to incompatibility of their absolute size. In this regard, we also used as the dependent variable the relative increase in value for each of the acquirers (equation 11), but in this case none of the evaluated factors has proved its significance. Also, because of the low coefficient of determination (0,16), the explanatory power of the OLS model is low. Then, it is impossible to judge on the adequacy of the obtained coefficients of the model, due to their very high values that makes them incompatible for different deals.

To improve the results, we applied binary choice model with the dependent variable as the qualitative effect of the deal, the creation or destruction of the fundamental value of the company per share as follows:

$$\text{Eff}_i = \gamma Z_i + \varepsilon_i, \quad (13)$$

where γ is the vector of parameters; Z_i means the vector of independent variables, characterizing the deal i ; ε_i is the model error.

The evaluation was performed in two modes. Mode 1 applied less number of explanatory variables (thus, it does not take into account a number of quantitative variables and the variables describing the method of deal payment), but covers all transactions in the sample. Mode 2 considers all the variables listed in Appendix, but due to lack of data on some of the characteristics estimated, sample is reduced to 259 deals. For better interpretation of the results, we calculated the marginal effects for factors Z_i . The combined results of evaluating the deal effect are demonstrated in Table 2.

By comparing the results of modeling, it is revealed that following factors have a significant impact at the creation or destruction of the fundamental value per share.

Deal type. According to the results of two models of binary choice (mode 1), deals related as acquisitions (dtypeacq), have a negative impact on the probability of creating a fundamental value for the acquiring company.

The method of deal financing. All four models of binary choice report that the deal funded with the capital increase (dfincspincr) improves the probability of a positive effect on the company's fundamental value.

Sector of economy. Models of binary choice have shown the negative impact for acquirers in the chemical industry (iduschem). This result correlates with the findings of Mantravadi and Reddy (2008). A similar effect is observed for the oil and gas companies (indusoilgas) and to the steel-processing industry (indussteel). If an acquirer is operating in the coal industry (induscoal) and real estate (indusrealest), there is a greater likelihood of creating fundamental value as a result of M&A. So the hypothesis 10 is confirmed.

Table 2

Total results of models estimation

Variable	OLS, sign	Binary logit model, mode 1: marginal effect	Binary logit model, mode 2: sign	Binary probit model, mode 1: marginal effect	Binary probit model, mode 2: sign
Dtypeacq		-0,092(***)		-0,189(***)	
Dtypecapincr	+ (***)			-0,808(***)	
Dtypeminorst	+ (**)			- (**)	
Dfincapincr		0,234(***)	+ (***)	+ (***)	+ (***)
Dfinconvert	- (***)			+ (***)	
Dfinprivplac	- (***)			+ (***)	
Indusbank	+ (***)				
Induspow	- (**)				
Induschem		-0,154(***)	- (***)	- (***)	- (***)
Indusoilgas		-0,279(***)	- (***)	- (***)	- (***)
Iduscoal			+ (***)		+ (***)
Indusrealest			+ (***)		+ (***)
Indussteel		-0,383(***)	- (***)	- (***)	- (***)
Industelec					+ (***)
Indusfinsvcs				+ (***)	
Dmpaymconvdt	- (**)				
Dmpaymdefpaym			+ (***)		+ (***)
Dmpaymdtassum					- (**)
Dmpaymeout			+ (***)		+ (***)
Predmarkcap			+ (*)		+ (*)

Note: In brackets the level of significance is marked: *** - 1%, ** - 5% * - 10%

Method of deal payment. As a result of a binary choice model (mode 2) deals paid through deferred payment (dmpaymdefpaym) and earn-out payment (dmpaymeout), have a greater chance of creating a fundamental value for the acquiring company. Thus, the hypothesis 4 cannot be rejected at the 1% level of significance. This result contradicts the conclusion by Grigorieva and Grinchenko (2013), who had come to the conclusion that the cash payment has a positive effect on the value.

Quantitative factors. Models of binary choice (mode 2) shown that acquiring companies with greater market capitalization before the deal (predmarkcap) have a greater chance of creating a fundamental value. If we assume that the market capitalization is the characteristic size of the company, this result is also different from the results by Grigorieva and Grinchenko (2013), which revealed negative dependence of the size of the acquirer and the deal effectiveness. Thus, the hypothesis 3 is rejected at the 10% significance level.

Deal country of origin turned out to be insignificant in all the models, which does not allow, in the framework of the research, to test the hypothesis 2.

With regard to other significant covariates there are contradictions in different models that do not allow asserting their influence on the dependent variable.

As a result of empirical research, it revealed that mergers and acquisitions in BRICS countries lead to an increase in the fundamental value per share of the acquiring company. There were also defined the factors that have a significant impact on the effect of mergers and acquisitions, resulting in a higher probability of value creation. These include: transaction type, company size, industry affiliation, way of deal financing and the method of payment.

These results have not only theoretical but also practical importance, since they allow the financial management of companies operating in emerging markets, including Russian, to design and implement mergers and acquisitions so as to create value for investors.

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Appendix

List of variables for the regression model

Variable	Description		
Dependent variables			
Difinvalue	Effect of M&A deal at the acquirer's fundamental value per share (equation 10)		
Eff	Effect of M&A deal impact at value creation or destruction: 1 – if $\Delta V > 0$; 0 – if $\Delta V < 0$		
Covariates			
Dom	Deal's country of origin: 1 – domestic deal (acquiring and target companies are from one country); 0 – international deal (acquirer and target are from different countries)		
Comdealyr	Year of the deal: 2009-2012		
Dealval	Value (size) of the deal, thousands of Euro		
Dtottargval	Value of a target company, thousands of Euro		
Modfeeinc	Premium paid for an acquisition, thousands of Euro		
Acqstake	The stake acquired via the deal, %		
Predmarkcap	Market value of an acquirer before the deal, thousands of Euro		
Dummy variables	1 – matching the type; 0 – others		
Deal type			
Dtypeacq	Acquisition	dtypecapincr	Capital increase
Dtypeminorstake	Acquisition of a minor stake		
Deal financing			
Dfincapincr	Capital increase	dfincapinj	Capital injection
Dfinconvert	Convertibles issue	dfinnewbankfac	New banking financing
dfinprivplac	Private placement		
Sector of industry			
indusairtrans	Air transportation	indusbank	Banking
induschem	Chemicals	induscoal	Coal manufacturing
ndusconstrsup	Construction materials	indusfinsvcs	Financial services
ndusfdproc	Food processing	indusmach	Machine building
indusmetmin	Metals mining	indusoilgas	Oil and gas
induspow	Energy production	indusrealest	Real estate
indussteel	Metals processing	industelec	Telecommunications
Method of deal payment			
dmpaymcash	Cash	dmpaymconvdt	Convertible debt
dmpaymdtassum	Debt	dmpaymdefpaym	Deferred payment
dmpaymeout	Earn-out	dmpaymshar	Share-paid