VALUE RELEVANCE OF COMPANIES' FINANCIAL STATEMENTS IN POLAND

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Abstract: Paper presents three attempts to model the relationship between financial reports of the companies listed on the Warsaw Stock Exchange and their market valuation. Main sections of the paper include: (1) overview of the contemporary issues in the "value relevance" studies with reference to the methodology of financial microeconometrics, (2) outcome of the research by M. Kubik-Kwiatkowska on value relevance of annual and quarterly reports, (3) results of the attempts by R. Bilicz on the association between E/P ratio and quarterly accounting data, (4) findings by A. Pernach on the relationship between ROIC or revenue and the market value. All results show that various connections between financials and valuation exist, depending on the approach.

Keywords: value relevance of accounting statements, financial microeconometrics, comparative valuation

INTRODUCTION: RESEARCH ON VALUE RELEVANCE

This paper reports new findings related to the value relevance of financials on valuation of companies listed on Warsaw Stock Exchange. Research methodology might be attributed to microeconometrics. Since we are in the field of finance it is convenient to use the term *financial microeconometrics* indicating the broad subject area of investigations in finance based on microdata.

With our topic we are obviously the part of fundamental analysis. Typical regression models for comparative valuation relate price or returns ratios ("multiples") to a selection of fundamental variables rooted in companies' financials [Damodaran 2012]. Seminal models of Fama and French [1993, 2015] also concentrate on finding associations between returns and the companies' financials. In empirical corporate finance and applied accounting such exercise is sometimes termed as the *value relevance of accounting numbers, of financial statements, of earnings, of book values* etc.

Valuation models use companies' financials in addition to market variables for explaining the price/ return multiples. The value relevance models are targeted "only" at examining the association between the company's market performance and the results disclosed in financial statements. Francis and Schipper [1999] distinguish between four various interpretations of value relevance (VR) with one of them being common to most studies i.e. saying that VR means association/ correlation between accounting information and stock returns/ prices.

The modern research on value relevance dates back to the nineties. Collins, Maydew and Weiss [1997] in their survey have shown that historically the earnings and book values keep being value-relevant over the forty years of reported research. However, there is a shift of value-relevance from earnings to book values which can be explained e.g. by increasing frequency of negative earnings and changes in average firm size. More recent survey presented by Beisland [2009] comments on more than 160 papers on the topic, most of them from the preceding two decades. He distinguishes the following research streams on value relevance: (1) VR of earnings and other flow measures, (2) VR of equity and other stock measures, (3) VR over time and (4) VR of alternative accounting methods.

In current decade numerous papers reporting the value relevance research results worldwide can be found. A sample from recent years might include articles by:

- Clacher, Duboisée de Ricquebourg and Hodgson [2013] on VR of direct cash flow components since the adoption of IFRS in Australia,
- Elshandidy [2014] on VR value relevance of accounting information from 1999 to 2012 in different segments of the Chinese stock market,
- Alali and Foote [2012] on VR of accounting information under IFRS in Abu Dhabi Stock Exchange,
- Mulenga [2015] on VR of bank financials in the Bombay Stock Exchange,

- Sharif, Purohit and Pillai [2015] on VR of accounting ratios in Bahrain Stock Exchange,

and many other papers.

Vast literature on VR directly applies or expands the basic models like that of Ohlson [1995] where share price is linearly related to earnings per share and book-value per share. Also, frequently applied is the approach by Easton and Harris [1991], where stock return is related to the earnings level and the earnings change over previous period.

In addition, more and more reports tackle new questions arising in VR research, both concerning the scope of analyses as well as methodological issues. The latter is e.g. discussed in the paper on econometric methodology in VR research by Onali and Ginesti [2015] who argue that including the lag of stock price as an explanatory variable in estimating price level regressions significantly improves model's performance.

VALUE RELEVANCE RESEARCH IN POLAND

A few reports on value relevance of accounting statements for Polish companies are available. Early results are reflected in the paper by Dobija and Klimczak [2010] who investigate companies listed on Warsaw Stock Exchange from 1994 to 2008. Paper reports evidence of the relevance of earnings, although the association does not improve over time. In particular, the new accounting regulation of 2000 as well as adoption of IFRS in Poland in 2005 do not strengthen this association. Methodologically, authors use the approach by Easton and Harris [1991].

In his book Klimczak [2014] investigates also VR questions for a sample of companies in Poland as well as in France and Germany for the period of 2005-2011. General conclusion resulted from the estimation of number of models states that on all three markets the companies' financials are relevant for their market valuation. However, the results are ambiguous regarding bilateral comparisons between the markets.

In Kubik-Kwiatkowska [2012] a version of her research results on value relevance of financial reports on valuation of companies listed on Warsaw Stock Exchange has been published. This research, described in her dissertation [Kubik-Kwiatkowska 2013] is presented also below.

In what follows there are three research projects presented: master thesis by Bilicz [2015], doctoral dissertation by Kubik-Kwiatkowska [2013], and bachelor thesis by Pernach [2015], all with Gruszczynski as the supervisor [*promoter*).

NEW RESULTS FOR POLAND: RESEARCH OF BILICZ [2015]

The study by Bilicz [2015] is focused on verifying whether selected financial variables are associated with E/P ratio. Data were extracted from quarterly financial statements of companies listed on the Warsaw Stock Exchange.

As for the time frame: first quarterly reports used in this research are the ones from the first quarter of 2005 and it was due to the fact that on May 1, 2004 Poland joined the European Union. The integration process triggered adjustments in Polish law and regulations so that the system would be concise with the one used by EU. The last data are from the fourth quarter of 2013. The entire period 2005-2013 is split into three subperiods with supposedly different determinants that may influence the dependent variable. From the beginning of 2005 till mid 2007 the prices on the Polish stock exchange were rapidly rising (*boom* phase). This was followed by a crush of the economy which eventually ended in the first quarter of 2009 (*downturn* phase). Finally from 2009 to 2013 the marked did not recover as the ones in USA or in Western Europe (*stagnation* phase).

As for the sample: some companies listed on the Warsaw Stock Exchange can become a target for speculators mainly due to their low liquidity. Therefore, only firms that in 2005 were included in one of the three indices WIG20, WIG40 or WIG80 are taken into consideration. Moreover, the companies belonging to financial sector are excluded. Also excluded are the firms that were removed from stock exchange or went bankrupt within the entire time frame. Final data set contains 80 firms.

Following the work of Huang, Tsai and Chen [2007] the price earnings (P/E) ratio was initially selected as the dependent variable. However, this idea was finally abandoned. There are two main drawbacks when considering this indicator. Firstly, under special circumstances, it can have negative values. The P/E ratio can also be very unstable especially when earnings for a specific period are close to zero. The most popular solution is to exclude all such observations. However, this could lead to a potential bias and, moreover, to an unbalanced panel. Another solution, suggested by Damodaran [2001], is to use the inverse P/E ratio which can be interpreted even if the values are negative. This approach was implemented and finally the dependent variable is set as the *trailing* P/E ratio and then inversed, resulting in what can be named *earnings yield* (E/P).

In total, there are eight different independent variables used in the study: return on equity, return on sales, book value, debt ratio, cash flow index, size of a company (capitalization), 10-year Poland bond yield and finally dividend ratio.

Four different econometric methods are applied: pooled regression, fixed effects estimator, random effects estimator and the Blundell-Bond estimator [1]. For pooled regression the results of Breusch-Pagan test and Wald test reveal that

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[1] For the application of panel models in corporate finance see Flannery and Hankins [2013].

individual specific effects are statistically significant, therefore pooled regression is not advocated. The choice between fixed and random effects estimators for a specific phase was supported by the Hausman test. Null hypothesis in the test was rejected only for the *stagnation* phase and this was a strong argument to use random effects estimator for the first two phases and the fixed effect estimator for the last. For the dynamic version the Blundell-Bond estimator is applied with two lags of the dependent variable. Using the lags can be justified by the work of Campbell and Shiller [1988].

The main aim of the study was to verify whether there are different sets of variables associated with the E/P ratio in different market phase. Several other hypotheses were also verified. One of them is that more advanced econometric methods can provide better results and should be considered in financial studies. After considering the series of tests and also examining the set of statistically significant variables we conclude that panel models provided better results than the standard pooled OLS regression.

It was also hypothesized that in *boom* and *downturn* phases the fundamental variables are not the best suited to describe the situation on the market. This is due to presumption that herd behavior and other psychological aspects may impact prices during *boom* and *downturn*. To confirm this hypothesis it was assumed that both lags of dependent variable in Blundell-Bond method should be statistically significant and with positive estimate of the coefficient. Also the number of other relevant fundamental variables, in *boom* and *downturn*, should be relatively small comparing with the *stagnation* phase.

Not a single fundamental variable turned out to be significant through all the phases. Moreover, the set of statistically significant variables varied depending on the market stage. This finding can support the idea of splitting the whole time frame into subperiods. For the *boom* phase one lag of the dependent variable, bond yield, dividend ratio, debt ratio, cash flow and also book value were statistically significant. For the second phase, *downturn*, only the lags, book value and size were significant and finally for *stagnation*: both lags, the second was negatively correlated with E/P, ROE, bond yield, dividend ratio and finally the size of the company were relevant.

The hypothesis of psychological aspects of investing as crucial for *boom* and *downturn* phases was only partially confirmed by the data. For the *downturn* stage emotions can be an important factor for deciding on the investment strategy. This statement can be supported by a relatively small number of statistically significant variables and also by the fact that both lags of dependent variable were positively correlated with E/P. For the *boom* phase it was possible to point out more fundamental determinants and also only the first lag was statistically significant.

Comparing our results with the outcomes of popular financial models such as Fed, Fama-French three-factor model or Gordon model it can be stated that only for the first one the strong empirical evidence was found in collected data. Bond yield has a positive impact on the dependent variable in both *boom* and *stagnation*

and when considering the *downturn* it can be said that for this phase statistical significance was not expected. For the second stage using the Fama-French three-factor model may be a proper way to describe the associations between price of a stock and financial variables but to support this thesis more detailed tests for this given period are required. Nevertheless when considering the market as a whole it may be easier to assume that prices and the returns on stock are best described by the Arbitrage Pricing Theory.

NEW RESULTS FOR POLAND: RESEARCH OF KUBIK-KWIATKOWSKA [2013]

The study by Kubik-Kwiatkowska [2013] aims to empirically investigate the value relevance of financial reports of companies listed on the Warsaw Stock Exchange. The source of financial data of companies listed on the Warsaw Stock Exchange SA is Notoria Service SA – collected until June 2011. Financial institutions are not included in this analysis as they are subject to a different reporting format. The base consists of consolidated and audited annual reports of 440 listed companies in the years from 2000 to 2010 (11 years). Additionally, the analysis of quarterly reports is based on unaudited financial reporting of 364 firms from Q1 2001 till Q2 2011 (42 quarters). Despite this limitation, the database has a large amount of missing data in each of the 204 categories in the financial reports, because companies often did not publish the full reports. The database contained the following reports: balance sheet, income statement and cash flow.

The samples were randomly divided into two sets: companies to build the model (training samples) and companies (holdout samples), whose data were used to validate the models. Financial reports were used to build the model for the years 2000-2006 and from Q1 2001 till Q3 2009 (training periods), while the holdout periods covered the reports from 2007 to 2010 and from Q4 2009 till Q2 2011.

The dependent variable in all models is the measure of company market valuation which is defined as market capitalization divided by total assets. For some models the variable is scaled by market adjustment, i.e. the denominator is multiplied by the WIG index (Warsaw Stock Exchange index). All items included in companies' financial statements are taken to configure the set of explanatory variables. The principal component analysis applied to these items results in a number of components representing specific financial subjects of companies' statements. These components are considered as explanatory variables, along with some additional categories such as employment level etc.

Models were estimated on the training samples and the training periods. The starting point for the initial selection of independent variables was to check their individual correlations with the dependent variable and to take into account only those variables for which those correlations were statistically significant. Then, a

backward selection was applied for each of the models. Models were estimated mostly by means of a random effects panel regression.

The results support the main hypothesis that there is a significant relationship between the measure of company value and information from financial reports. Although detailed lists of significant explanatory variables are different for a variety of examined models, there are a few factors which are common for all of them. For models based on both annual and quarterly financial statements, a positive relationship has been shown between the company valuation variable and the accounting information such as equity, profit (net profit) and income tax.

Thus, the factors representing typical Ohlson model like profit and equity have significant association with a measure of the value of companies listed on the Warsaw Stock Exchange. This has been expected after earlier findings by Dobija and Klimczak [2010]. Additional factor related to market value like income tax has proven significant in all types of models examined in the study.

Overall, taking into account variety of empirical models it can be summarised that the following four factors are relevant for company valuation: profit, equity, tax and company size (measured as logarithm on asset values). The additional models have also proven that a factor called "industry" has a relationship with value of companies.

Taking into account models based on annual financial reports, it has occurred that the best type of model was the one where dependent variable was a scaled value of a company with a correction for market sentiment (WIG index). This shows that relationship between information from firms' financial statements and the share prices of these companies improve when market sentiment measured by a stock exchange index is taken into account.

The study confirms that annual reports containing audited financial statements explain the observed share prices significantly better than unaudited quarterly reports. However, this conclusion should not be considered as final as the analysed models relied solely on historical financial statements, employment data and industry factors. Therefore, they did not take into account nonfinancial information and forecasts of the company and sector growth.

Despite the above reservations, it can be concluded that the value relevance research continues to be a source of knowledge about the usefulness of companies' financial reporting and the valuation of companies on the stock exchange. An important result is to show value relevance of two new financial factors: income tax and the size of the company. These factors are rarely considered in the valuation models and value relevance models.

NEW RESULTS FOR POLAND: RESEARCH OF PERNACH [2015]

The study by Pernach [2015] focuses on the quantitative analysis of the link between return on invested capital (ROIC), revenues and the market value reported by companies listed on Warsaw Stock Exchange Index (WIG). The main focus of

the inquiry is placed on the differences in this association across industry areas what is reflected in the main hypothesis claiming that the relation of both revenue and ROIC of a company to its valuation differs depending on the industry sector.

The merits underlying the research portray ROIC and revenues as main sources of value for companies, an idea presented by Goedhart, Koller and Wessels [2010]. Revenue of a company reflects scope of its activity combined with the value of products or services it delivers. On the other hand the efficiency of the company operations is grasped by the ROIC indicator. Somehow vague concept of the value of a company is interpreted as the value for its shareholders and also the company's valuation on the stock market. Therefore, we assume that the assessment of the company's value is in fact the answer to questions regarding its ability to be highly compensated for its products and services as well as its capacity to use its resources efficiently.

Empirical models supporting the hypothesis are based on publicly available financial statements of 301 companies listed on Warsaw Stock Exchange Index for 2014. These are annual consolidated financial statements for 2013 published by money.pl and bankier.pl. The initial number of almost 380 entities was reduced mainly due to the difficulties in acquiring reliable data. The ROIC is calculated as the ratio of operating income adjusted for the tax to book value of invested capital (i.e. equity plus long-term debt). The market value of each company was computed as the yearly average of their capitalization at the end of all trading sessions.

There are two relationships verified in this analysis. Firstly, we examine the relation between natural logarithm of the company's average yearly market capitalization as a dependent variable and natural logarithm of the company's revenue. Basic model included 32 explanatory variables. This was reduced to 15 by merging dummies for similar sectors (industries). The results indicate that revenues are positively related to market values. The marginal effect of revenue on company's valuation is highest for energy, services, construction and financial sectors. Alternatively, retail and wholesale trade turned out to have relatively low but almost constant marginal effect in valuation driven by revenues.

Next, the association between natural logarithm of the company's average yearly market capitalization as a dependent variable and its ROIC is examined. These models have much weaker fit then the models with revenue. Also, not for all sectors ROIC values turn out to be positively related to market values. Even though, the differences between the relationship of ROIC and the valuation of companies across industries are obvious.

Overall the study contributes to the value relevance issues in the empirical research by examining a fundamental question about the sources of companies' value. It successfully proves the link between revenues, ROIC and market capitalization as well as the variation of this relation between sectors and therefore illustrates the relevance of financial data for the value. The relevance of ROIC appears to be weaker than this of revenues.

CONCLUSION

This paper presents three new studies in the stream of value relevance research for the companies listed on Warsaw Stock Exchange. Despite the fact that they differ significantly in the scope, approach and econometric methodology, the outcomes are similar: there exists a significant association between the market valuation of companies and the information from their accounting/ financial reports. However, depending on the approach and data base the association seems to be either vague or not significantly strong. Some of our models (like those by [Kubik-Kwiatkowska 2013]) have demonstrated this association very convincingly over time and sample.

Paper's contribution lies in: (a) presenting new attempts in analysing value relevance of financial results for companies in Poland, (b) showing novel methodological approaches for financial microeconometrics, like the use of principal components representing companies' financials or "discovering" the validity of E/P ratio in value relevance research, (c) offering alternative ideas for selection of sample and subsamples of companies as well as for choosing explanatory variables for market valuation models.

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