

AN EMPIRICAL ANALYSIS OF THE EFFECTS OF THE 2007-2008 FINANCIAL CRISIS ON CHANGES IN THE VALUE CREATION OF FIRMS IN THE FINANCIAL AND REAL ECONOMIES OF COUNTRIES WITH ANGLO-SAXON AND CONTINENTAL FINANCIAL SYSTEMS

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Abstract: *In writing this article, I would like to answer the question of how the determinants of company value vary across groups of countries and economies, and how the global financial crisis of 2007-2008 has influenced the mechanisms of these determinants. Are there differences in the impact of the crisis across the groups of countries and economies under study? In my study, I have tested the validity of my hypothesis using the available database, which I have developed in the light of the literature and my research objectives. After a theoretical review and a presentation of previous empirical research, I conducted independent statistical tests to answer my question. The structure of the article is as follows. First, I identify the determinants of firm value based on the major literatures I have reviewed. The next section is the empirical section, in which I describe the database used for my empirical investigation. After describing the panel regression model and the methodology used, I present the empirical tests carried out and their results, and finally I draw my conclusions. In my study, I do not seek to compare my results with those of existing, previously conducted research.*

Keywords: company valuation, 2007-2008 global financial crisis, panel regression model

JEL Classification: G12, G15, G32

1. Literature review

1.1. Creating value of the company

"The process of creating value is the acquisition, management and use of resources in order to produce value for the consumer." (Chikán and Demeter, 2006: 3)

Porter's (1998) value chain theory focuses on value creation. According to this

theory, all companies perform activities in order to create value. These activities can be divided into two broad categories, primary and secondary activities. Primary activities affect the quality and cost of production of the product/service and include inbound logistics, the production process, outbound logistics, marketing and sales, after-sales services. Secondary, supporting activities, which promote the efficiency of primary activities and improve business efficiency, include company infrastructure, human resource management, technology development and procurement.

1.2. Identifying the value creators

According to Rappaport (1998), the primary task of managers is to increase shareholder value, which they can achieve by setting strategy and operational performance criteria.

The shareholder value approach is considered universal, and can be used to analyse public and private limited companies, business units, strategies and product lines. The direct link between strategy and shareholder value analysis is illustrated by “converting” business strategy into the amount of money they generate. For operational managers, one of the most important results of a shareholder value-based analysis is that it helps to identify the activities that require the most attention in the operation of the company. The 7 financial value drivers of business value, which Rappaport (1998: 171) calls macro-level value drivers, are:

1. an increase in revenue,
2. the operating profit margin,
3. investment in fixed assets and
4. in current assets,
5. the corporate tax rate,
6. the cost of capital,
7. the length of growth period.

Accordingly, the main evaluation characteristics of the performance measurement system will be the returns of the shareholders at the corporate level, the shareholder's added value and value prediction indicators at the operational level, and the key value creation drivers at the lower organisational level (Rappaport 1998).

Copeland et al (1999) argue that the value of a firm is determined by its ability to generate cash flow and the return on cash flow on investment and refer to the factors that determine value as key value drivers. When comparing corporate performance indicators, they point out that there are two methods, the entity DCF model and the multi-year economic profit model, which meet the criteria of achieving a long-term perspective and capital intensity.

Damodaran (2006) identifies four approaches to evaluation:

- (1) discounted cash flow valuation, which focuses on the present value of expected future free cash flows and is the basis for all valuation methods;
- (2) relative valuation, which uses the price of similar assets as a basis for comparison;
- (3) option valuation, which is used to determine the value of assets with option features; and
- (4) the asset-based valuation model, which includes the liquidation value and the replacement value.

Fernandez (2007: 1) distinguishes the following methods of company evaluation:

1. balance sheet-based, asset value type procedures;
2. income type procedures based on the income statement;
3. procedures based on goodwill;
4. discounted cash flow based valuation;
5. value added type methods;
6. options.

Damodaran (2006: 406-407) presents two methods of free cash flow derivation. In one method, all cash flows that are due to the financiers of the firm are added together, i.e. free cash flows to equity attributable to owners, principal repayments due to creditors, interest expense and new borrowings, and preferred dividends due to preferred shareholders. The other method is to add up all cash flows before allocating them to the liability holders. The use of the latter seems to be simpler.

Damodaran (2006: 10) considers discounted cash flow valuation as the basis for all valuation methods, on which all other approaches are based. In order to understand and use either relative or option pricing models, we need to start with the DCF procedure.

To summarise the theoretical and practical lessons from the above sections, it can be concluded that, based on Porter's (1998) value chain theory - that is, that the purpose of a company's operations is to create value, and therefore the source of corporate value creation is operations - Rappaport's (1998) net of owner value and shareholder value maximisation - through which value creators can be identified, Copeland et al's (1999) key value drivers - which are value determinants closely linked to the firm's cash flow generating capacity - to Damodaran's (2006) valuation models - which are discounted cash flow based, relative and option valuation based, and asset based valuation models - there is a logical link between the processes. Based on all these theoretical insights, the value drivers of a company can be defined as follows:

I.FCFF = EBIT * (1 - T) – Net Capital Expenditures –

Change in non cash Working Capital the free cash flow of a company, which is the amount of cash flow that is generated for an investor in the company. Since it is a complex value creator, it can be broken down into the following factors:

1. EBIT (Earnings Before Interest and Taxes)
2. T=Tax Rate, the marginal rate of corporate income tax
3. Reinvestment= (Net Capital Expenditures + Change in non cash Working Capital), the additional investment which is the sum of the net capital outlay and the change in the working capital without cash

II.Invested capital

It means capital invested in the core activity.

4. Invested capital = Net working capital + Net tangible assets

III.Return on invested capital

5. ROIC (Return on Invested Capital): return on invested capital,

$$ROIC = \frac{EBIT(1 - t)}{Invested\ Capital}$$

IV.Net Margin

6. Net Margin: profit margin, which is the ratio of net profit (profit after tax) to revenue: $Net\ Margin = Net\ Income / Sales$

V.Cost of capital

7. Market ROA: return on assets at market value, which I use as a proxy for WACC, $Market\ ROA = \frac{Net\ Income}{Market\ Values\ of\ Equity + Market\ Value\ of\ Debt}$

VI.Sales growth rate

1.3. The Anglo-Saxon vs. the Continental concept of value and financial system

There are a number of reasons for the widespread adoption of the ownership value theory in the world. The increasing liberalisation of markets, the rise of private capital and the information revolution have all contributed to the spread and widespread application of the theory (Black et al., 1999; Marján, 2004).

In the US, it has become fully accepted that managers maximise shareholder value. In Europe and Japan, however, all stakeholders, i.e. owners, consumer advocacy, customers, competitors, media, employees, political interest groups, environmentalists, suppliers, government and local communities are also given a high priority in analysis and evaluation (Freeman – McVea, 2005:193; Béresné and Maklári, 2021).

Copeland and colleagues (1999) cite the different ownership structures in countries, the way in which ownership is controlled, the legal form of firms, and the

concentration of capital resources as reasons for the theories' practical application. In the US, public limited companies are characterised by fully fragmented ownership, whereas in Europe ownership is in the hands of several large corporations, banks, families, companies are private and cross-ownership between companies is not uncommon.

We need to distinguish between Anglo-Saxon and continental concepts of value. The source of the differences is primarily the different financial systems (Black et al., 1999; Sulyok-Pap, 1998).

Vigvári (2011) traces the emergence of different financial systems back to the 18th and 19th centuries. He sees the reason for the differences in the proportion of external and internal sources involved in financing corporate activity, on the one hand, and in the corporate governance instruments determined by the way in which financing is provided, on the other. The literature uses the terms external and internal management systems to describe the two types of corporate governance, and direct and indirect financing to describe the method of financing. Direct, i.e. securities-based, financing is the external form of management, which is typically predominant in Anglo-Saxon countries, where investors exercise control over management through the capital markets. The internal management system, where control over management is exercised by the stakeholder with several internal interests, and which is characterised by indirect financing through banks, is mostly observed in companies in Japanese and continental European countries. In practice, none of these forms of governance exists in a pure form. The two extremes are the macroeconomic environment and the scope of the company's activities, which are the determinants of investment. The state also plays an important role in taxation, regulation and subsidies (Vigvári, 2011: 160-163).

During the 1990s, the securitisation process advanced to the point where US financial intermediation became “market-centric” as opposed to “bank-centric” on the continent. The exponential growth of the derivatives market has played a decisive role in this process. For banks, securitisation means that securities have become more important as assets, bank assets are more marketable, bank liabilities can be off-balance sheet, and the stability and transparency of the lender-debtor relationship is reduced (Lamfalussy, 2008: 85-86).

In the United States and the United Kingdom we find large and liquid capital markets, the vast majority of investors are institutional investors, competition in the markets is very important, and the key role in financing is not played by banks but by the capital market. The company is therefore worth what it exchanges hands for on the market. It is the real market price category that is decisive, and this is established if the right information is available. There is also the category of intrinsic

value, which is not always the same as the market value, as the market does not have complete information. The difference exists only in the short run, in the long run the intrinsic value and the market value are the same (Ligeti and Sulyok-Pap (eds.), 2006)

Capital markets in continental Europe and Japan are smaller and less liquid, with the majority of shares concentrated in the hands of banks, governments and families. In business, the relationship of trust and professional experience between banks and companies plays an important role. Due to the strong state involvement, the German system is top-down, which is reflected in the valuation of companies, with the market playing little role in the valuation (Béresné, 2017) In continental Europe, company valuations are carried out exclusively by audit firms, while in the Anglo-Saxon countries, consultancy firms specialise in this task. (Nagy, 2016)

Accounting and tax rules are also reasons for the discrepancy. German companies are guided by the principle of prudence, while Anglo-Saxon companies are guided by the principles of fairness and equity. German legislation allows for the creation of hidden reserves, which means that the company pension fund remains a resource of the company, is included in the equity capital, increasing its value and affecting the valuation of the company. Anglo-Saxons thus have lower equity, while without reserves the Anglo-Saxon equity ratio is higher. The two views converge, but the differences do not disappear completely (Béresné, 2018).

2.Methodology

2.1. Introduce of the database

To prove the hypothesis of the research, I examine a database of 18 European countries, 10 sectors and 1553 companies for the period 2004-2011, which can be considered as a highly balanced panel with few missing observations. The database was downloaded from Aswath Damodaran's website and has undergone several transformations.

A characteristic of Damodaran's database is that it defines data in thousands of dollars rather than in the currency of the country, which makes it easy to compare companies. For the industry categories, he modifies the Capital IQ categorisation and creates one himself based on the Value Line categories, but this was not consistent over the whole study period. Therefore, I use the Global Industry Classification Standard (GICS) classification in force in 2014 to make the sector categorisation consistent.

For firm value, I used the firm value category, which is the sum of market

capitalization - the best estimate of the market value of equity - and market debt. Among the factors influencing firm value as a dependent variable, I selected the explanatory variables that are most determinant of firm value. In selecting the variables, I started from the context that the ability of a company to create value is determined by its ability to generate cash flow. The works of Rappaport (1998), Copeland and co-authors (1999), Damodaran (2006) agree that in identifying value creating factors, firms should focus on cash flows, profit margin, growth rate, capital employed, increasing return on capital employed, and reducing tax burden and cost of capital. My model is defined using a reduced set of value creators because there are many indicators to choose from to identify each value creator. In my model, I have sought to ensure that all explanatory variables have a significant relationship with the firm value, the dependent variable.

2.2. The model, the method used

I conducted my empirical research by specifying the panel model. The most sophisticated way to use time series and cross-sectional data together is to analyse the panel model, also known as longitudinal data. The panel model allows to observe the evolution over time (time series) of the characteristics (cross-sectional data) of the same companies, since panel databases contain data from several periods and several individuals (company, industry, country) in tabular form. This fact allows us to deal with effects that, in the case of the present model, may be firm-specific factors that we cannot measure and firm-specific variables that do not vary over time. (Ramanathan, 2003: 498-501)

After conducting the tests, as the next step in my empirical research, I defined a multivariate regression model of the following form:

$$\begin{aligned} LnFV_{i,t} = & \alpha + \beta_{lnEBIT}lnEBIT_{i,t} + \beta_{tax}tax_{i,t} + \beta_{lnReinv}lnReinv_{i,t} \\ & + \beta_{lnInvC}lnInvC_{i,t} + \beta_{ROIC}ROIC_{i,t} + \beta_{NetM}NetM_{i,t} \\ & + \beta_{MROA}MROA_{i,t} + \beta_{dlnRev}dlnRev_{i,t} + u_{i,t} + \varepsilon_i \end{aligned}$$

2.3. Data processing and results

After the specification of the model, the analysis was performed using the statistical program STATA 11, which is suitable for statistical, econometric calculations and graphical visualizations.

For the empirical testing, I rearranged my panel database to examine the changes in the financial and real economy in the effect of the crisis. To do this, I divided the countries in the sample into two groups based on the type of financial system in the country. One group is Anglo-Saxon, which includes the United Kingdom and

Ireland, and the other group is continental financial system countries, which includes the other countries in the sample, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the Netherlands. The results are presented in Table 1.

Table 1: Results of panel regression between 2004 and 2011 in the financial and the real economy in the European countries with Anglo-Saxon and Continental financial systems

	Anglo-Saxon financial sector	Continental financial sector	Anglo-Saxon real economy	Continental real economy
	lnFirm_V	lnFirm_V	lnFirm_V	lnFirm_V
	Coefficients	Coefficients	Coefficients	Coefficients
lnFirm_V L1.	0.2297**	0.8122***	0.7757***	0.3682***
lnEBIT	0.3995***	0.0909*	0.1434***	0.3649***
Tax_r	-0.2985 ns.	-0.1695 ns.	-0.1309*	-0.2306***
lnReinv	0.2789***	-0.0015 nsz.	0.0226***	0.0596***
lnInv_C	-0.0731 nsz.	0.0276 ns.	0.0514***	0.1666***
ROIC	0.1350 ns.	-0.6648 ns.	0.0064 ns.	0.0221***
Net_M	-1.4415**	-0.0138**	0.1211 ns.	0.4065 ns.
MROA	-5.1564**	0.9637*	-1.4377***	-2.0524***
dlnRev	0.2096*	0.0889**	0.1065***	0.3244***
Dummy of 2005	0.4041**	0.4421***	0.2767***	0.4066***
Dummy of 2006	0.2446 ns.	0.1601**	0.2862***	0.4727***
Dummy of 2007	0.1011 ns.	0.1647**	0.0237 ns.	0.2401***
Dummy of 2008	-5.4447***	-0.8425*	-1.0217***	-1.0270***
Dummy of 2009	-0.1099 ns.	0.2025**	0.2899***	0.3619***
Dummy of 2010	-0.2602 ns.	0.2029**	0.1877***	0.3011***

Dummy of 2011	skipped	skipped	skipped	skipped
lnEBIT*2008 dummy	-1.1198***	-0.0569 ns.	0.0108 ns.	-0.1482***
Tax_r*2008 dummy	1.0596*	1.3510 nsz.	0.0106 ns.	0.1223 ns.
lnReinv*2008 dummy	0.7040***	-0.0404 ns.	-0.0126 ns.	-0.0831***
lnInv_C*2008 dummy	0.7914***	0.0922 ns.	0.0443 ns.	0.2699***
ROIC*2008 dummy	0.1106 ns.	-6.6184**	0.3093***	0.5506***
Net_M*2008 dummy	-0.5846 ns.	-0.6572 ns.	-0.1428 ns.	0.2187 ns.
MROA*2008 dummy	16.2716***	16.5110 nsz.	-1.7768***	-0.4030 ns.
dlnRev*2008 dummy	-0.0747*	0.1047 ns.	-0.0124 ns.	0.0270 ns.
_constants	3.8870***	0.8126***	0.5443***	1.4883***
R ² overall	0.9678	0.9719	0.9792	0.9553
R ² within	0.9333	0.7116	0.6972	0.7872
R ² between	0.9745	0.9909	0.9905	0.9686
Wald (chi ²)	10214.08***	103918.65***	79072.49***	68179.86***
Number of observations	166	144	1274	956

Source: own calculation

Note: At the levels of significances *** 1 %, ** 5 %, * a 10% respectively, ns not significant.

In the analysis of **the financial sector in the Anglo-Saxon countries**, the factors affecting the firm value are the previous period's firm value, LnEBIT, reinvestment and revenue growth rate, which have a positive impact, while the profit margin and return on assets at market value have a negative impact. The other explanatory variables have no impact on the response variable. Among the years, 2008 has the largest negative impact in these countries and in this sector, while the other years have a positive or no impact on the value. When analysing the cross effects, it can be seen that the dummy variables LnEBIT*2008 and the dummy variables Revenue growth*2008 have a negative impact, while the multiples of the tax rate, LnReinvestment, LnInvested capital and MROA by the dummy variable 2008 have

a positive impact on the value.

For the financial sector in Continental countries, among the factors affecting business value, the previous period's business value, LnEBIT, return on assets at market value and revenue growth are significant and have a positive effect, and the profit margin is also significant and has a negative effect. Tax rate, LnReinvestment, LnInvested capital and ROIC have no effect on the dependent variable. Among the years, the year 2008 has a negative impact, but to a lesser extent than for the Anglo-Saxons, while the other years have a positive impact on the business value. Looking at the cross effects, it is observed that the multiplication of ROIC by the year dummy variable 2008 has a negative effect on the value.

As regards the real economy in the Anglo-Saxon countries, among the factors affecting firm value, the previous period's firm value, LnEBIT, LnReinvestment, LnInvested capital and growth rate are significant and have a positive effect, and the tax rate and return on assets at market value are also significant and have a negative effect on value. The other explanatory variables have no effect on the dependent variable. Among the years, 2008 has a negative impact, the other years have a positive impact on the firm value. When analysing the cross effects, it is striking that the year dummy variable $MROA*2008$ has a negative effect, while the multiplication of ROIC by the year dummy variable 2008 has a positive effect on the value of the firm.

For the real economy in continental countries, the factors affecting firm value are the significant increase in the previous period's firm value, LnEBIT, LnReinvestment, LnInvested capital, ROIC and sales growth, with positive effects and negative effects for the tax rate and return on assets at market value. The profit margin does not affect the dependent variable. Among the years, 2008 has a negative impact, while the other years have a positive impact on the firm value. Looking at the cross effects, it can be seen that the year dummy $LnEBIT*2008$ and the year dummy $LnReinvestment*2008$ have a negative effect, while the multiples of LnInvested capital and ROIC by the year dummy 2008 have a positive effect on the firm.

Summarising the analysis of the changes in the financial and real sectors in the countries with the Anglo-Saxon and Continental financial systems in the effect of the crisis, I have found the following:

There is empirical evidence that the financial sector was more affected by the 2007-2008 crisis compared to the financial and real economy. Looking at the countries with the Anglo-Saxon and Continental financial systems separately, 2008 can be seen as the year of the crisis, both in the financial and the real economy. The downturn in the Anglo-Saxon countries was much more pronounced in the financial

sector, while the real economy was almost identical in the two groups of countries.

3. Conclusions

Overall, my hypothesis is only partially valid, as in my empirical investigation, firms in the real economies of the Anglo-Saxon and Continental financial systems experienced a similar decline in business values.

In my research above, I have also provided empirical evidence that the 2007-2008 crisis had a greater impact in the financial sector, comparing the financial and real economies. Looking at the countries with Anglo-Saxon and Continental financial systems separately, it can be said that 2008 can be considered the year of the crisis, both in the financial and the real economy. The downturn in the Anglo-Saxon countries was much more pronounced in the financial sector, while the real economy was almost identical in the two groups of countries.

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