EMPIRICAL ANALYSIS OF FIRMS' VALUE CREATION IN THE CONTEXT OF CRISES

Anita KISS, Orsolya Tünde NAGY

Institute of Accounting and Finance, Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary
Institute of Accounting and Finance, Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary
kiss.anita@econ.unideb.hu
nagy.tunde@econ.unideb.hu

Abstract: *In today's highly competitive world, one of the most important business objectives for owners is to generate shareholder value and wealth. In order for an investor to know how to effectively deliver wealth growth, it is important to know the value creators of the business. A number of studies have been published in the management literature to identify the value creators of ownership. This article draws an essence from the literature reviewed, which are identified as key drivers of value creation, which are presented in the first half of the study. In the second logical part of the paper, the characteristics, causes and major crisis episodes of the 2007-2008 global financial crisis and the COVID-19 crisis are presented. In the methodological part, the panel regression model is used to analyse the 702 firms in the database. The main objective of the study is to answer the following questions: which are the most important value drivers and how the influence of these value drivers changes in the aftermath of the COVID-19 crisis.*

Keywords: company valuation, 2007-2008 global financial crisis, COVID-19 crisis, panel regression model

JEL Classification: G12, G15, G32

1.Literature review

1.1.Identifying the value drivers

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.
Before the 1990s, the shareholder value model was mainly used to value investments and price acquisitions, and the discounted cash flow method was used for the calculations. Today, however, it is incorporated into both planning and performance evaluation. According to the shareholder value model, rational actors in a market economy estimate the value of an asset by the risk-adjusted magnitude of expected future cash flows.
According to Black et al (1999), who also emphasise the importance of the shareholder perspective, the value achieved by the firm should exceed the expected return on capital employed. In this case, we can speak of shareholder value creation, which is reflected in the stock price gains and dividends paid to owners. According to Rappaport (1998), the primary task of corporate managers is to increase shareholder value, which they can achieve by setting strategy and operational performance criteria, which also form the basis of corporate control systems (Lakatos et al, 2020).
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 create (Hamad- Szekeres, 2019). The value drivers identified in the process are called value drivers, and their fit into the company's goal system is illustrated in Figure 1 by the shareholder value network.

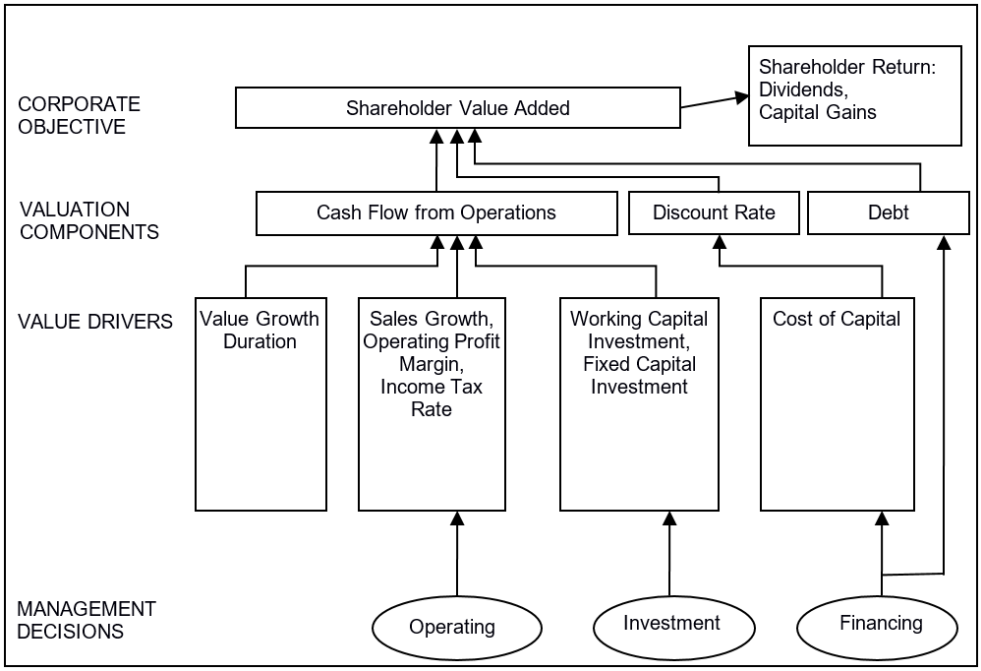

Figure 1: The shareholder value network
Source: Rappaport (1998:56)

Operating decisions are mainly reflected in the growth rate of sales, the operating profit margin and corporate tax. Investment decisions are reflected in investment in working capital and fixed capital, and the value creation factor related to financing decisions is the cost of capital. The duration of value creation, as a value creation factor, is based on management estimates, which predict the period until an investment will generate a return above the cost of capital. Value drivers are required to be measurable where possible and to have a well-planned range of values. Value is determined by long-term performance, including risk, reflected in cash flows, and not merely by short-term results.
Summarising the theoretical and practical lessons from the literature reviewed, 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 hence the source of corporate value creation is operations -, Rappaport's (1998) network of shareholder value and shareholder value maximisation - through which value creators can be identified, Copeland et al's (1999) key value creators - 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. $\mathbf{FCFF = EBIT * (1 - T) - Net\ Capital\ Expenditures - Change\ in\ non\ cash\ Working\ Capital}$
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 non cash working capital

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):

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

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 we use as a proxy for WACC,

$$\text{Market ROA} = \frac{Net\ Income}{Market\ Values\ of\ Equity + Market\ Value\ of\ Debt}$$

VI. **Sales growth rate**

2.The 2007-2008 global financial crisis

Stiglitz (2009) describes the 2007-2008 crisis as the biggest economic crisis since the Great Depression and the first global recession in the era of the new globalisation. Bokros (2009) also describes the crisis as global and identifies a number of features in which the world's countries and national economies are interconnected. Lámfalussy (2008) describes the 2007-2008 crisis as a profound crisis in the international financial market, financial globalisation and the vulnerability of the financial system, and analyses and compares previous financial crises.

In the introduction to his article, Bélyácz (2014) writes that many authors note, but rarely emphasise, the similarities or even common origins between the Great Depression and the global financial crisis of 2007-2008. The main cause of both crises was the deregulated financial free market. The problem is not one of predictability, but of failing to account for uncertainty, or of increasing uncertainty through the actions of financial market participants. The starting point for the crisis was the US mortgage market. The characteristic securitisation technique of the US mortgage market mixed expected non-performing loans with senior loans, thereby spreading contaminated securities across the market and contaminating it (Király-Nagy, 2008).

In the summer of 2007, the real estate bubble burst, which can be seen as the direct cause of the crisis and triggered the second mortgage crisis, which induced a series of domino-like events (Gyarmati-Medvegyev, 2011).

The financial crisis primarily affected those markets that were directly linked to structured products and the US mortgage market. In September 2008, the global financial system was on the verge of collapse (Király-Nagy, 2008).

3.The COVID-19 crisis

What is special about the COVID-19 crisis is that, unlike all previous crises, it was not triggered by an internal disturbance in the economies, the international financial system or the trading system, but by an external non-economic factor affecting all elements of international production (supply) and demand. Restrictions on free movement reduce the production of goods and services, and the resulting high unemployment and income losses limit household consumption. In turn, the uncertain outlook minimises the willingness of firms and households to invest (Palócz-Matheika, 2020).
The epidemic has affected all actors in the economies - due to overburdened health systems, closures, economic downturns or changing labour market trends, among other factors (Török et al., 2023).
The tragic effects of the coronavirus devastated all areas of the economy, society and commerce in a short period of time (Hajdú-Rácz, 2020).
Due to global uncertainty and physical constraints, world trade contracted in the first half of 2020 to an extent unprecedented during the 2007-2008 financial and economic crisis (Palócz-Matheika, 2020).
The crisis caused by the crown virus showed that there is not only a demand crisis, but also a supply crisis. In both areas, production stoppages due to the health situation are causing a crisis (Botos, 2020).
The crisis has reduced profitability and efficiency in most industries, while some sectors and companies have benefited from the situation, and several areas have suffered huge losses (Szekeres-Dékán Tamásné Orbán, 2019; Szekeres-Hamad, 2020). The pandemic's most negative impact on businesses has been the fall in demand. Looking at the business consequences of the COVID-19 crisis, we can see that risks affect the value of a company in several ways. In addition to reduced cash flow and limits to future growth opportunities, uncertainty increases operational risk and, through it, the cost of capital. The unpredictability of the future worsens the liquidity position of many firms (Juhász-Szabó, 2021) and, due to the cost of R&D, this can be a particularly high operational risk for the pharmaceutical sector due to its impact on profitability (Tömöri, 2014; Tömöri et al., 2022). The fierce competition in the pharmaceutical market is also affected by the impact of the COVID-19 pandemic, which is expected to further increase the trend of acquisitions (Tömöri et al., 2021).
The consequences of the crisis were quickly felt in equity markets: the previous optimism disappeared and corporate risk premiums rose dramatically. In just three months, the global economic outlook for 2020 has gone from an expected growth rate of more than 3 percent to a decline of 3 percent. This is worse than the loss experienced during the 2007-2008 global financial crisis (Juhász-Szabó, 2021).
In most countries, there have been two economic policy responses to the downturn: central banks have started pumping huge amounts of money into the financial markets, while governments have simultaneously announced economic rescue packages. Many firms lost their growth potential as a result of the crisis. One reason is that lower profitability limits investment plans. On the other hand, falling demand and uncertainties in supply chains have made some manufacturing capacity redundant (Juhász-Szabó, 2021).

4. Material and method

The main purpose of writing this paper was to answer our research questions. What are the factors that influence the value creation of firms and how is the influence of these factors evolving in the aftermath of the COVID-2019 crisis. To answer the research question, we formulated the following hypotheses, which were developed in light of the literature reviewed.

There is a significant correlation between enterprise value and earnings before interest and taxes (EBIT), reinvestment, invested capital, return on invested capital, net margin, sales growth rate, tax rate and return on assets (MROA) at market value. Furthermore, 2020 is considered to be a year of crisis in all sectors, which had a negative impact on the value of companies.
To validate the hypotheses of the research, a database of 725 companies from 9 European countries was examined for the period 2017-2021, which is considered a highly balanced panel with few missing observations. The database was downloaded from the EMIS website and required several transformations. The transformations included deleting all columns where there was little data for a given variable and deleting all firms that did not have a report for all years of the period under study. Among the countries examined, company data for Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Poland were analysed. These countries were chosen because they are former socialist countries and are now EU member states (EMIS, 2023).
We continued our 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 present model may be firm-specific factors that we cannot measure and firm-specific variables that do not vary over time (Körösi et al., 1990, pp. 278-289; Ramanathan, 2003, pp. 498-501).
As a next step in the empirical research, the following multivariate regression model was defined:

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

For firm value, we used the firm value category, which is the sum of market capitalisation - the best estimate of the market value of equity - and debt at market value.
The model we have used is defined using the reduced set of value creators because there are many indicators to choose from to identify each value creator. In our model, we sought to ensure that all explanatory variables have a significant relationship with business value, the outcome variable.
We used the natural logarithm of the variables for business value, EBIT, reinvestment and capital employed, and the natural logarithm of the change in sales for the growth rate, as the distribution of the variables was thus close to normal.

5. Results and their evaluation

In our empirical research, we investigated how the COVID-19 crisis affected the relationship between business value and value drivers. To do this, we first had to extend the original panel regression model with initial random effects by including the effect of years as a "time dummy" variable in addition to the explanatory variables, and by adding the dependent variable lagged by one year to the independent variables to examine the adjustment. This extended model was used to run the panel regression.
Based on the estimated values of the model parameters, it can be said that the business value is positively correlated with EBIT, reinvestment, invested capital, return on invested capital, profit margin and sales growth. There is a negative correlation between the tax rate and goodwill, and a strongly negative correlation between MROA as a proxy and the profit

variable. The effect of 2017 is included in the constant term with a positive coefficient in the model. The years 2018 and 2019 are positively correlated with business value.
The impact of the crisis is visible in 2020, as this year has negatively affected the business value.
The year 2021 has been omitted due to collinearity.

6.Conclusions

In this paper, the literature reviewed approaches the topic from the perspective of business valuation, applied finance and strategy, and the following structure is used to explain the topic. In the first logical part, we dealt with corporate value creation, the shareholder value model, which provided a kind of strategic framework for the article. The second and third parts deal with crises, presenting its main aspects. The fourth main part contains the research and empirical analysis, with the main directions of the research being: the factors affecting the value of the company and the power of these factors to influence it; how the value of the company is affected by the COVID-19 crisis and how the factors affecting value affect the value of the company as a whole in the companies studied. Overall, the empirical results support our hypotheses that there is a significant relationship between firm value and earnings before interest and taxes (EBIT), reinvestment, invested capital, return on invested capital, net margin, sales growth rate, tax rate and market return on assets (MROA). Furthermore, 2020 can be considered as the year of the crisis in all sectors, which had a negative impact on the value of companies, so the analysis of the changes in the relationship between value creation factors as a result of the COVID-19 crisis suggests that 2020 can be considered as a clear year of the crisis.

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