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COMPANY INVESTMENTS IN THE CONTEXT OF FINANCIAL STRATEGIES

This paper is focused on the determination of type of financial strategy to company investment. The analysis traces which financial strategies are preferred by companies from industries classified according to technological intensiveness. The study used data from 7,095 Czech enterprises during the 2014-2018 period. The typology of strategies was based on dynamic criteria created by combining indices of financial ratios. This study confirmed that management do not strictly prefer a conservative or aggressive investment strategy. A quarter of investment companies are rather inclined towards a strategy with conservative elements regarding the area of financing and aggressive elements regarding the golden rule of investing (Strategy B). One-third of the companies practise risky investment (long-term assets grow faster than sales). The contribution of this paper is an extension of investment theory by the typology of financial strategies of investing companies, which can be useful in making future investor decisions, for creators of subsidy policies and financial institutions providing financing for company investments.

Keywords: company investments, fixed assets, criteria, business investment strategy

JEL Classification: E22, D22, M21

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1. INTRODUCTION

The successful development of companies under the continuously changing conditions of a market economy becomes a synonym of their survival regardless of their size, specialisation or region in which they run their business. A basic prerequisite for the successful development of enterprises is efficient investment based on their

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investment strategy and financial strategy for financing investments. The countries of Central and Eastern Europe have undergone an economic transformation in the last ten years, aimed at stable economic growth. The enterprises are trying to catch up with the performance of their Western European counterparts. The question is what kind of financial strategies is used by firms for investments in these countries, i.e. what sources are used to finance their investments and how much risk they take. The aim of this paper was to define the financial strategies applied in company investments (their investment behaviour) in Czech business sector by using dynamic criteria. This paper focuses on the formulation of the financial strategies used for investments. These strategies take risk into consideration and are characteristic for companies from transforming economies. In recent years, research on companies' investment strategies has focused on their investment orientation (Bontempi, 2016, Howell, 2017) and the sources of investment financing (Beladi et al., 2021; Hall et al., 2016). The funding of investments plays a key role in realising investments. According to Beladi et al. (2021), companies with higher cash flow uncertainty invest less in R&D. Galloway et al. (2017) highlighted the use of venture capital by young businesses to fund investments in innovation. The size of the company also plays an important role in deciding on how to finance investments. According to Hall and Lerner (2010), large enterprises prefer internal funds for financing their investments more than small ones. This idea was elaborated on by Ferrando and Preuss (2018), who measured the link between corporate financing and investment decisions of European companies. They found that investment by SMEs in fixed assets is positively related to the use of bank finance, whereas internal finance is preferred for intangible asset investments.

Czarnitzki and Hottenrott (2011) provided an analysis of R&D investments and capital investments with respect to the financing constraints of enterprises, and found that the availability of internal funds is for enterprises more decisive for R&D investments than for capital investments. They observed that smaller enterprises suffer more from external constraints for R&D investments than larger ones.

When determining the investment financing strategy, the company decides whether it is better to use internal or external resources. Morellec et al. (2015) examined the choice between bonds and bank loans in a company's financing decisions and its effects on corporate investments. This analysis shows that the factor influencing a company's investment behaviour is the enterprise growth options and bargaining power. Vrchota and Rehor (2017) stressed that the sector type is an important factor influencing investment strategy.

The focus of most studies on financing investments includes sources of funding and type of company by size or general sector (services, manufacturing) (Bontempi, 2016; Czarnitzki and Hottenrott, 2011). These studies thus neglected to determine the real defined financial strategy within enterprises for financing their investments, whilst this paper focuses on the division of enterprises according to technological intensiveness.

Regression analysis is a very popular method used in defining the investment strategies of firms. Statistical analysis by He et al. (2020) focused on the use of a regression model for disentangling investment strategies of state-owned and private enterprises. Falcone (2018) used correlation analysis in assessing corporate green investment strategies; another way is the use of neural networks for evaluating the impact of investments (Alberg and Lipton, 2017). In contrast to these methods, this paper used an approach based on dynamic criteria constructed by combining financial ratios in order to identify investment and financial behaviour of companies. Indices of these indicators are commonly used in financial analysis for time and spatial comparisons, and to construct financial models (e.g. Higgins et al., 2016).

The paper addressed the research question of whether a certain type of financial investment strategy prevails among investing enterprises, and the importance of the sector in choosing a financial strategy. The author wanted to find out if some financial strategies are typical for enterprises classified as belonging to sectors with different levels of technological intensiveness.

The paper is structured as follows: the theory of company investment and investment policy are briefly analysed in the first part, while the second presents the data and research methodology. The third part shows and discusses the main results of the companies' investment analysis. The last part summarises the results.

2. LITERATURE REVIEW

Jorgenson and Griliches (1967) and Tobin's (1969) Q theory are groundbreaking. The paper is based on the neoclassical theory of investment derived from the theory of profit maximisation driven by technological change. In neoclassical theory, companies maximise profit through optimal investments in capital and the optimal employment of labour. Optimality in this case means only investing if the marginal returns on investment are higher than the marginal costs. Tobin's Q theory provides an alternative view on investments, analysing the effect of investment horizon and risk on investment decisions. The general economic view states that investments respond positively to falling interest rates, however this relation is limited by other factors affecting investment, especially in periods of low interest rates. Cheety (2007) found that the effect of interest rate changes on investment size is not monotonous. According to this study, a reduction in the interest rate has a weaker investment incentive effect if the values of the company's assets are high.

The factors influencing the investment decisions of companies can be divided between external factors and internal factors. External factors are the business cycle (Bachmann and Bayer, 2014), changes in interest rates, the uncertainty of the state's economic policy (Chen et al., 2019) or a focus on green investment (Bai and Sarkis, 2017). Internal factors include the economic situation of the company, expectations of future development and the strategy in management decision-making. The results of Heizer and Rettig (2020) suggest that the corporate policies of company

financing and investment decisions are influenced and driven by the attitudes of top management team members as a group. Salehi et al. (2020) found that competition discourages managers from investing in risky investments. Roychowdhury et al. (2019) suggested that various aspects of a firm's disclosure decisions (reporting) and the information environment affect investment decisions. This study found that higher reporting quality increases the shareholders' ability to monitor managers and thus reduces managerial incentives to overinvest. Lin et al. (2018) highlighted the importance of the value of growth opportunities and the cost of capital for the investment decisions of managers.

When deciding on investments, companies account for three aspects shown in the so-called "investment triangle" – return, risk, liquidity (Becker, 2010). It is not possible to maximise the return and liquidity from the investment and at the same time minimise the risk. The managers must choose and favour a certain investment goal.

A business can be regarded as a system. This is because it comprises a number of different elements that need to work together for success, namely marketing activities, operations activities, investment activities (Stiebale, 2013), and financial (innovation) activities (Segarra and Teruel, 2014), which are involved in raising finance, budgeting, managing cash flows and human resources activities. All these activities must be combined to contribute towards improved overall corporate strategy and better competitiveness. Businesses are open systems because they interact with their environment, and their activities will be affected by, for example, changes in legislation or in society. All business activities affect, and are affected by, other individuals and organisations (stakeholders include the community, suppliers, employees, investors, the government and distributors). These groups may try to change a company's behaviour. Some managers adopt a stakeholder approach – they believe that a partnership approach with these groups will enable all of them to benefit. Better relations with staff may cost more in the short run, but can lead to greater productivity and better performance in the long run. The way managers treat different groups may depend on their strength and their level of interest in the business (Gillespie, 2013).

There are only two business reasons to own or invest in a company. One is because the company will increase its earnings and therefore its value. The other is to receive dividends from cash flows, in practice it is often a combination of both. Management teams perform better if they are measured against some set of criteria. One of the criteria that is of interest to investors is the return provided by funds invested in the business. In a general sense, managers are tasked with two key objectives: to find attractive investments, and to deliver attractive returns (Lawrence, 2015). Company investment policy adjusts the decision-making process and determines when to obtain long-term assets, to take over a competitor (by merger or acquisition) or to make new affiliations. Careful conservative investment policies choose an increased pace of growth that does not end with a lack of financial sources under the same debt,

liquidity and dividend politics (Neely, 2003). Making a choice between sustaining or increasing investments, or investing towards both is not simply a matter of money. Investments directed at growth require ideas and sometimes new technologies. Most companies make both sustaining and growth investments at the same time (Lawrence, 2015).

To make effective investment decisions, managers must understand many facets of risk. Many important managerial decisions are made under conditions of risk or uncertainty, under which informed managerial decisions are still possible. Experience, insight and prudence allow investment managers to devise strategies for minimising the chance of failing to meet business objectives. General risk categories are: business risk, market risk, inflation risk, interest-rate risk, and credit risk. Currency risk is another important danger facing global businesses, because most companies wish to eventually repatriate foreign earnings back to the domestic parent company (Hirschey, 2009).

One of the factors influencing the total risk assessment of a particular company and its applied investment strategy is keeping to the general rules of financial management, e.g. the rule of a milder growth rate of long-term property (investment) rather than the rate of revenues (sales); see Synek and Kislingerová (2015).

If firms are profit-maximisers, then it seems reasonable to assume that, in the longer term, increasing profits will be associated with increased size. In the short term, some profits may have to be sacrificed in order to grow the business. A company can grow in three main ways, respectively known as: horizontal (growth occurs when a company develops or grows activities at the same stage of the production process), vertical (vertical growth is an expansion of the business up or down the value chain, incorporating more than one stage of production), and diversified growth (diversification is the growth of the business in a related or unrelated market). These growth options provide an insight into strategic behaviour and, therefore, how the company can gain greater control over its markets and its competitors (Begg and Ward, 2016).

According to Scholleová (2009), the basic reasons for investment can essentially be divided into those created from:

- the need of development by property acquisition (increase of assets), and
- the need of capital evaluation (placement of liabilities), see Figure 1.

The more productive the company, the more probably it will invest and the time periods between particular investments will be shorter (Raff and Ryan, 2008). The financial manager makes decisions to ensure that the company has sufficient funds to take advantage of investment opportunities. To help the analyst appraise these decisions, one needs to study the flow of funds. The financial manager examines the past and future expansion plans of the company and their impact on liquidity, while financial analysts focus on gross working capital. Managing working capital management sets out two fundamental decision issues for the firm, i.e. the determination of:

- the optimal level of investment in current assets, and
- the appropriate mix of short-term and long-term financing used to support this investment in current assets.

Need of development	No	Increase the value differently	←	Do not invest
	Yes	Invest		→
		Yes		No

Fig. 1. Basic reasons for investments

Source: Scholleová, 2009.

These decisions are influenced by the trade-off between profitability and risk that must be addressed. The use of short-term debt as opposed to longer-term debt is likely to result in higher profits because the debt will be paid off during periods when it is not needed. These profitability assumptions suggest maintaining a low level of current assets and a high proportion of current liabilities to total liabilities. This strategy will result in a low, or conceivably negative, level of net working capital (Van Horne and Wachowicz, 2009).

There are two extreme variants of company investment: a conservative or an aggressive operating policy depending on the market parameters (Figure 2). It is never optimal to be aggressive (conservative) in investment and conservative (aggressive) in production.

	HIGH	←	→	LOW
Liquidity	conservative policy			aggressive policy
Profitability	aggressive policy			conservative policy
Risk	aggressive policy			conservative policy

Fig. 2. Basic motives for firms investing

Source: Van Horne and Wachowicz (2009).

1. Conservative policy: the greater the level of current assets, the greater the liquidity of the company, and with greater liquidity comes less risk, but also less

profitability. “Debt constraint motivates conservative decisions” – Lara et al. (2016) found that conservative companies invest more and issue more debt in settings prone to underinvestment and that these effects are more pronounced in businesses characterised by greater information asymmetries. Conservatism improves investment efficiency.

2. Aggressive policy – “lean and mean”: low levels of cash and marketable securities, receivables and inventories, but the highest profitability potential as measured by ROI ($Net\ profit / (Cash + Receivables + Inventory + Fixed\ assets)$). Therefore, more aggressive working capital policies lead to increased risk. If the company decides to invest aggressively, then there is a higher risk of bankruptcy. This situation is especially typical for start-ups (Tanrisever et al., 2012).

3. METHODOLOGY AND DATA

The paper deals with the use of dynamic criteria for defining financial strategies for company investments, which are created by using a combination of geometric means of financial indices. The paper also addresses the question of the differences in the financial strategies of companies classified according to technological intensity. Mura et al. (2015) recommended using financial dynamic indicators when applying strategic management in enterprises. The following research questions were answered:

1. Is it possible to derive financial strategies for company investments by using the dynamic criteria?

2. Is it possible to confirm that the financial strategy of a company depends on the technological intensity sectors?

The suitability of the criteria regarding their rate of independence was tested using the correlation matrix of indices of all chosen criteria at the significance level of 0.05 (Montgomery and Runger, 2007). An investigation of the investment strategy preferences of businesses in the Czech Republic in the last five years was then conducted, based on the financial statements of 7,095 companies in 2014-2018. These companies were classified by economic activity (NACE Rev. 2 at 2-digit level) based on Eurostat methodology – technological intensiveness, and divided into five categories. Group A1 includes high and medium-high-technology manufacturing industry enterprises. Group A2 consists of low and medium-low-technology manufacturing industry enterprises. Group B1 includes enterprises that deal with knowledge-intensive services, and Group B2 are enterprises that deal with less knowledge-intensive services. Group C includes other enterprises (their economic activity can be agriculture, construction and mining industries, energy production and transfer; Eurostat, Annex 3, 2018). Table 1 shows the values of indicators used in the dynamic models for the whole set of companies in each year.

Table 2 shows that most companies (35.18%) fall into group B2, representing above all companies from the retail, wholesale, land transport and tourist areas. The second-most numerous group (20.63%) is formed by companies in the knowledge-

Table 1
Used indices and descriptive statistics (average)

Index	Index description	2014	2015	2016	2017	2018
IE	Equity/Capital (%)	48.86	50.28	50.68	62.79	54.39
CR	Current assets/Current liabilities (multiplier)	1.08	1.06	1.13	1.99	1.37
GRI	Sales/Fixed assets (multiplier)	0.08	0.07	0.12	0.11	0.16

Note: Number of observations: 7,095. Data from balance sheet and profit/loss account.

Source: authors' calculation.

-intensive services (B1) from the field of healthcare, social services, insurance, education and research and development, while the smallest representation (10.5%) can be seen in group A1 with companies focusing on the production of machinery, cars and chemicals.

Table 2
Classification of companies according to their economic activity

Group	Economic activity	Number	Percentage
A1	High and medium-high-technology manufacturing industries	748	10.54
A2	Low and medium-low-technology manufacturing industries	1,314	18.52
B1	Knowledge-intensive services	1,464	20.63
B2	Less knowledge-intensive services	2,496	35.18
C	Agriculture, construction, mining industry, energy production and transfer	1,073	15.12
All	Total	7,095	100.00

Source: authors' calculation.

The companies were selected according to their structure by technological intensity, which corresponds to the structure of the economy in the Czech Republic. The companies were chosen so that a compromise between the depth of analysis and generalisation of the results can be reached. At the same time, the structure of the sectors according to technological intensity was compared with the sectors' structure of the Visegrad Group (V4) countries, so that any conclusions of the analyses could be more generalised. The Eurostat database was used for this comparison. Gross Value Added (GVA) was recorded for 64 branches and subsequently grouped into five equal groups according to technological intensiveness in 2014-2018 (Table 3). In all four countries (Czechia, Hungary, Poland, Slovakia), GVA is the largest contributor to services (group B1 and group B2). The difference is only in case of group A1. In Czechia and Hungary, it accounts for about 13% of GVA production, while Poland and

Slovakia have a lower share. This lower proportion is compensated by the proportion of Group C. A statistical test of the average against the reference constant was used for verification. The average values for the Czech Republic in 2014-2018 were achieved for the reference groups of individual groups. Four single-sample *t*-tests were used, where the significance level $\alpha=0.05$ was adjusted by the Bonferroni correction. On the basis of this test, the values were not different from the declared values.

Table 3

Structure of gross value added according to technological intensiveness in V4 countries in % (geometric mean in 2014-2018)

Countries	Group according to technological intensiveness				
	A1	A2	B1	B2	C
European Union – 28 countries	7.50	8.33	38.70	35.07	10.40
Czechia	13.00	13.30	30.47	29.55	13.65
Hungary	13.10	10.24	34.23	30.55	11.85
Poland	5.57	13.69	30.35	33.55	16.80
Slovakia	8.61	12.98	30.44	31.35	16.57

Source: authors' calculation.

The financial strategies for company investments are characterised by three dynamic criteria, formed by the geometric mean of annual changes of the value obtained from the financial records of the investigated subject in the observed period. These criteria are: *the criterion of the share of equity* (ratio of equity to the total capital), and *the criterion of current liquidity* (ratio of current assets to short-term payables). These two criteria characterise investment strategies from the financing of long-term property point of view. The last criterion is *the criterion of the golden rule of financing* (ratio of sales to fixed assets) characterising the investment rate with regard to the attained performance of companies. The position of financing evaluates the involvement of debt and short-term payables within the investment process.

Each company was assigned into one of four quadrants based on the comparison of the average index of changes of fixed assets and the index of the average change of the observed financial ratios defining one of the strategy items. Quadrant I contains companies that do not only invest in renewal of the current property. For this reason, the value of the long-term property, in net prices, increases and, at the same time, these companies have a conservative approach to risk. Quadrant II represents companies with a tendency to a higher risk with property increases, and can be seen as more aggressive. Quadrant III and IV represent companies that do not invest in long-term property and, as such, their value decreases due to depreciation. Attention was focused on enterprises that are increasing their fixed assets. They were assigned according to the established dynamic criteria into quadrant I or II.

3.1. Equity share criterion (ESC)

Axis X represents values of the geometric means of the index of long-term property and Axis Y represents the values of the geometric mean of the index of equity (see Figure 3).

$$\text{Quadrant I: } \sqrt[4]{\prod_{i=1}^4 IE_i} > 1 \quad \text{and} \quad \sqrt[4]{\prod_{i=1}^4 IFA_i} > 1 \quad (1)$$

$$\text{Quadrant II: } \sqrt[4]{\prod_{i=1}^4 IE_i} \leq 1 \quad \text{and} \quad \sqrt[4]{\prod_{i=1}^4 IFA_i} > 1 \quad (2)$$

where: IE_i – average annual index of equity share $(E_n/C_n)/(E_{n-1}/C_{n-1})$, E – equity, C – capital, IFA_i – average annual index of fixed assets (FA_n/FA_{n-1}) , FA – fixed assets, n – current year.

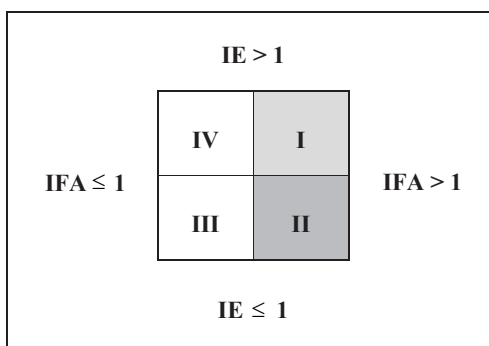


Fig. 3. Equity share criterion

Source: authors' calculation.

Quadrant I represents companies that primarily financed their investing activities in the observed period from their equity, which is less risky, or their capital structure did not change. In quadrant II are companies with increased debts in the observed period, adversely decreasing their equity in the observed period in favour of incurring debts, which results in higher risk coming from them.

3.2. Current ratio criterion (CRC)

Axis X represents values of the geometric mean of the index of long-term property (fixed assets), and Axis Y represents the values of the geometric mean of the index of the current ratio. Regarding the relativity of all criteria, the current ratio was used instead of the index of net working capital. When using the previously

considered net working capital, there would have been a problem with mathematical relationships regarding the growth rate, as it is a differential indicator (see Figure 4).

$$\text{Quadrant I: } \sqrt[4]{\prod_{i=1}^4 ICR_i} > 1 \quad \text{and} \quad \sqrt[4]{\prod_{i=1}^4 IFA_i} > 1 \tag{3}$$

$$\text{Quadrant II: } \sqrt[4]{\prod_{i=1}^4 ICR_i} \leq 1 \quad \text{and} \quad \sqrt[4]{\prod_{i=1}^4 IFA_i} > 1 \tag{4}$$

where: ICR_i – average annual index of current ratio $(CA_n/CL_n)/(CA_{n-1}/CL_{n-1})$, CA – current assets, CL – current liabilities, IFA_i – average annual index of fixed assets FA_n/FA_{n-1} , FA – fixed assets, n – current year.

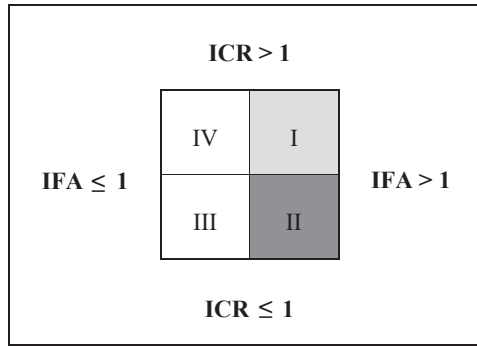


Fig. 4. Current ratio criterion

Source: authors' calculation.

In quadrant I, there are companies with improving liquidity, while in quadrant II there are companies whose liquidity decreased. Quadrant II again shows certain elements of the aggressive strategy with increasing risk of worse liquidity. As with net working capital, this indicator also indicates the connection between the capital structure and the property over time.

3.3. Golden rule of investing criterion (GRIC)

Konecny (2013) defined the golden rule of investing as a recommendation that the growth rate of investments (calculated as the proportion of fixed assets at the end of the actual period, including the depreciation reached by the actual period, to fixed assets at the end of the last period) should not be higher than the rate of sales growth (calculated as the proportion of sales for goods, own products and services reached by the actual period to these kinds of sales reached by the last period). It is also possible to use the geometric means of fixed assets to calculate this indicator. Axis X represents values of the geometric mean of long-term property (fixed assets),

and Axis Y represents the values of the mean of the golden rule of investing (see Figure 5).

The golden rule of investing comes from the company's policy of sustainable growth. If a company grows too quickly, the need for additional capital increases, which is not always available. As a consequence of overheating growth, the company can go bankrupt because of the problems with financing the growth, even though there was a sufficient space in the market for its activities. The key measurement of growth is the rate of sales (turnover). This parameter is partly derived from the companies' opportunities in the market of products and services, and from the opportunity to finance their growth, i.e. what is the amount and in which structure it will be necessary to secure additional sources. In this context, the so-called permanent company growth is mentioned, which at its basis represents a growth rate of the company's sales under which there are no other demands for extreme financing of the company (Synek, 2011).

$$\text{Quadrant I: } \sqrt[4]{\prod_{i=1}^4 IGRI_i} > 1 \quad \text{and} \quad \sqrt[4]{\prod_{i=1}^4 IFA_i} > 1 \quad (5)$$

$$\text{Quadrant II: } \sqrt[4]{\prod_{i=1}^4 IGRI_i} \leq 1 \quad \text{and} \quad \sqrt[4]{\prod_{i=1}^4 IFA_i} > 1 \quad (6)$$

where: $IGRI_i$ – average annual index of golden rule of investing $(S_n/FA_n)/(S_{n-1}/FA_{n-1})$, S – sales (revenues from the own products and services + revenues from sold goods), IFA_i – average annual index of fixed assets (FA_n/FA_{n-1}) , FA – fixed assets, n – current year.

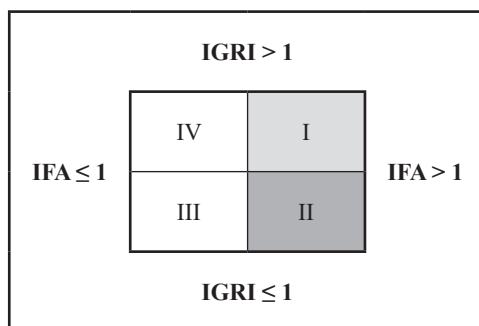


Fig. 5. Golden rule of investing criterion

Source: authors' calculation.

Quadrant I comprises companies that invest more slowly than their sales increase, while quadrant II represents companies that undertake higher risk as they invest more quickly than their sales grow in their business.

The selected dynamic criteria (ESC, CRC, GRIC) were used to classify eight types of financial strategies, both in terms of financing and investment rate. Individual strategies A-H were created on the basis of combinations of quadrant I and II in all three dynamic criteria (see Table 6).

4. RESULTS AND DISCUSSION

Multicollinearity can be drawn from the matrix of correlation coefficients (Table 4), which show the strength of the dependencies between pairs of particular variables (by means of particular pair correlation coefficients). An independent variable correlating strongly with another independent variable repeats more or less the same information that is included in the model. Multicollinearity is considered harmful if some of the correlation coefficients of independent variables exceed approximately 0.75 (Montgomery and Runger, 2007).

Table 4
Correlation matrix of criteria indexes

Index	FA	IE	CR	GRI
FA	1	-0.04*	-0.09*	-0.2*
IE	-0.04*	1	0.09*	0.16*
CR	-0.09*	0.09*	1	0.08*
GRI	-0.2*	0.16*	0.08*	1

Note: Marked correlations are significant at $p < .05000$

Source: authors' calculation.

The correlation analysis investigated the strength of the mutual linear dependence of the indexes which characterise investment strategies. The correlation matrix (Table 1) shows that their correlation is almost insignificant and it is not necessary to consider any of the criteria as irrelevant. None of the correlation coefficients of the two indexes exceed 0.75; therefore, there is no harmful multicollinearity.

The set of monitored enterprises in Czechia was analysed. The need for the company's fixed assets is predetermined to a certain extent by the corresponding sector of economic activity. From this assumption, it is also possible to deduce the probability of the higher investment activities of companies from the high-tech industry sector.

The group of companies was analysed from the investment activities point of view, i.e. it was divided into companies with an increase of fixed assets, and those without a change or with a decrease. The division of company investment activities is also important for their assessment using the dynamic criteria.

The companies with increasing fixed assets are fewer than the companies with decreasing outstanding value, or with a stable value of their fixed assets (Table 5). Only 42.48% of companies had their average growth index moved to around the value of 1, while the others suffered moral and physical depreciation of property or renewed their property to the previous level.

Table 5

Classification of companies according to their investment activity

Companies	Number of companies	Percentage
Companies with growing fixed assets	3,014	42.48
Companies with decreasing fixed assets	3,367	47.46
Non-defined	714	10.06
Total	7,095	100.00

Source: authors' calculation.

Most companies with fixed asset growth (1,070) run their business in the B2 sector – less knowledge-intensive services (Table 5). The highest share of investing companies can be found in group A1 – high or medium-high technological industry (49.06%), whilst the lowest in group B1 – knowledge-intensive services (32.65%).

Table 6

Classification of companies according to their investment activity (sectors)

Sectors of economic activity	A1	A2	B1	B2	C
	Number of companies				
Companies with increasing FA	367	597	478	1,070	502
Companies with decreasing FA + non-defined	381	717	986	1,426	571
Total	748	1,314	1,464	2,496	1,073
	Percentage				
Companies with increasing FA	49.06	45.43	32.65	42.87	46.78

Source: authors' calculation.

The companies were divided into four quadrants based on the dynamic criteria defined in the methodology illustrated in Figures 6 to 8 show the share of the companies that meet the criteria.

4.1. Equity share criterion

A total of 3,922 companies out of the 7,095 were assigned to quadrants I and IV regarding the share of their equity, which means that more than half of the companies have a growing share of equity (Figure 6). More than half of these companies (2,000)

do not invest in fixed assets – taking advantage of their position in the market, their sufficient property equipment, and by cumulating their economic results they strengthen their financial stability. Only 19.93% of companies with an increase in their fixed assets take on further debt.

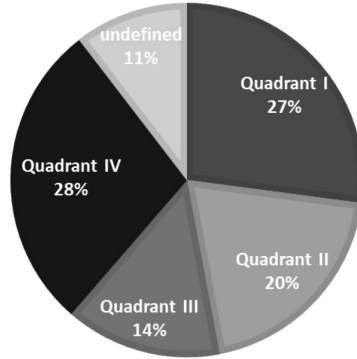


Fig. 6. Equity share criterion (quadrants)

Source: authors' calculation.

4.2. Current ratio criterion

Regarding the criterion of current ratio, the companies are more or less evenly spread over the quadrants. The fewest companies can be found in quadrant III, representing those that do not invest and whose ratio of current assets and short-term sources decreases. Half of the companies saw their current liquidity growth, whereas the other half saw its decrease. Figure 7 shows that 25.33% of the companies with an improving property and capital structure do not increase their fixed assets.

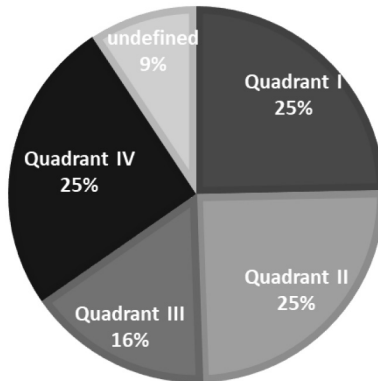


Fig. 7. Current ratio criterion (quadrants)

Source: authors' calculation.

4.3. Golden rule of investing criterion

The high percentage of the companies in quadrant II (31.36%), and those in the opposite quadrant IV (31.98%) is rather unusual (Figure 8), as it shows almost the same ratio of companies undertaking risk as those with a conservative investment approach. The number of companies with the conservative approach to this criterion is slightly higher, as the index of the golden rule of investing is higher than 1 for 3,048 companies.

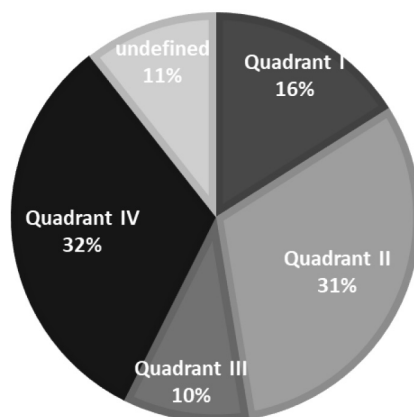


Fig. 8. Golden rule of investing criterion (quadrants)

Source: authors' calculation.

The three selected criteria selected allow to classify investing companies (i.e. enterprises whose average annual growth rate of fixed assets > 1) into eight types of investment strategies (Table 7).

Table 7
Types of investment strategies

Types of strategies	Criteria – quadrants			Risk	Investment zone	Financing	Invest rate
	ESC	CRC	GRIC				
1	2	3	4	5	6	7	8
Strategy A	I	I	I	purely conservative	Investment zone	conservative	conservative
Strategy B	I	I	II	rather conservative		conservative	aggressive
Strategy C	I	II	I	rather conservative		neutral	conservative
Strategy D	II	I	I	rather conservative		neutral	conservative

1	2	3	4	5	6	7	8
Strategy E	II	II	I	rather aggressive	Speculative zone	aggressive	conservative
Strategy F	II	I	II	rather aggressive		neutral	aggressive
Strategy G	I	II	II	rather aggressive		neutral	aggressive
Strategy H	II	II	II	purely aggressive		aggressive	aggressive

Source: authors' calculation.

STRATEGY A This type of investment strategy is characterised by an absolute risk aversion and belongs to purely conservative strategies. All criteria place the company in the first quadrant, which means that it primarily funds its fixed assets from equity, further strengthens the role of low-risk long-term funding sources and its investments grow slower than its sales.

STRATEGY B

The investment strategy B is one grade more aggressive on the risk scale than the previous one, however it may still be characterised as rather conservative. While the investments grow faster than sales, the firm tends to utilise lower-risk, own long-term funding sources.

STRATEGY C

This strategy is again rather conservative as it shows conservative elements according to two criteria, while it classifies the third as an aggressive approach. Fixed assets are still mostly funded from equity, but more short-term sources are also occasionally added. The business holds to the golden rule of investing, which is a sign of risk aversion.

STRATEGY D

It is only the utilisation of external funding sources that introduces an element of aggressiveness into this strategy. All other criteria make it into a rather conservative one. The company's investments grow slower than its sales and it mainly utilises long-term funding sources.

STRATEGY E

This rather aggressive strategy tends to be more risk prone with respect to funding. The company gets into debt when acquiring fixed assets and utilises short-term borrowed capital; the growth of assets is less dynamic than the total sales growth.

STRATEGY F

The rather aggressive strategy F takes risks in utilising borrowed capital for investments while also breaking the golden rule of investing. The risk is reduced by the fact that investments are funded from long-term debts.

STRATEGY G

Again, a rather aggressive strategy relying on neutral financing and an aggressive approach to the volume of investment. While the growth of equity predominates, at the same time the volume of more short-term funding sources (such as an operating loan or supplier credit) increases. For the company, the sales growth rate is not decisive, and its investments grow faster than its outputs.

STRATEGY H

The only purely aggressive strategy, which according to all criteria places the company in the second quadrant and suggests risk prone behaviour. It shows a tendency towards risk financing of investment activities from external short-term sources at a rate higher than the sales dynamics.

Figure 9 shows a classification of enterprises with growing fixed assets and their classification according to defined strategies.

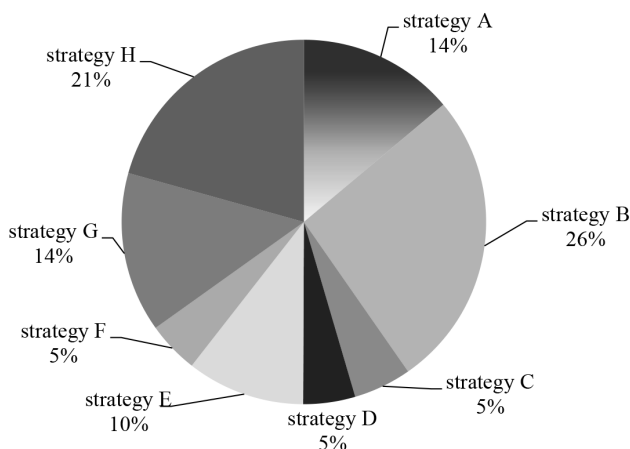


Fig. 9. Classification according to strategies (increasing fixed assets)

Source: authors' calculation.

The most one-sided strategies, A (purely conservative strategy) and H (purely aggressive strategy), were adopted by 1,041 enterprises (35% of the total); 14% of companies show a purely conservative approach to investment, while 21% with growing fixed assets assume the highest degree of risk. However, most of them (797 – almost 26%) adopted the rather conservative Strategy B, which is characterised by its conservative way of funding fixed assets (from own and long-term external sources – credit, subsidy; see Lososová and Zdeněk, 2014) and by a bolder rate of investment (the companies' investments grow faster than sales). The least common (138, i.e. 5%) was found to be the rather aggressive strategy F, by which the investments grow faster than sales, with the concurrent growth of indebtedness caused by utilising long-term borrowed capital.

From the point of view of the different technological intensiveness of various industries, the results can be interpreted as stating that businesses in all sectors most frequently adopt strategy B, meaning that their investment intensity is greater than the growth of sales, but the risk involved is reduced by a conservative approach to funding. The largest percentage of companies (30.37%) applied this strategy in the less knowledge-intensive services sector (B2). The second most popular is the purely aggressive strategy H, with the exception of sector A1, where the firms assume high risk (Table 8).

Table 8
Classification of enterprises according to strategies and industries (%)

Strategies	A1	A2	B1	B2	C
Strategy A	18.80	13.57	12.34	13.64	12.55
Strategy B	20.44	26.13	25.31	30.37	23.90
Strategy C	8.99	5.19	4.60	3.27	6.77
Strategy D	5.18	6.03	4.39	3.27	5.58
Strategy E	15.80	10.22	7.11	8.32	14.74
Strategy F	3.54	4.36	5.65	4.86	3.98
Strategy G	10.08	15.41	15.69	14.86	12.95
Strategy H	17.17	19.10	24.90	21.40	19.52
Total	100.00	100.00	100.00	100.00	100.00

Source: authors' calculation.

Table 7 disproves the assumption that any particular strategy predominates among companies in a particular industry. Although there are certain differences with respect to individual strategies, the values are far from extreme. Neither strategy is found in more than fifty per cent of all businesses in a particular industry.

CONCLUSION

This paper focused on the determination of a prevailing financial strategy in Czech enterprises for financing investments. The conclusions can be generalized with certain probability to companies from the V4 group of countries, because Novotná and Volek (2020) showed that companies broken down by country within the V4 do not affect the level and dynamics of capital intensity. The financial strategies were defined by using dynamic criteria, and the sectors were accordingly divided by technological intensiveness to those more or less technology intensive. The authors elaborated on the Bontempi (2016) study that solely dealt with services and manufacturing. This work analysed whether industries with different technological intensiveness levels would also adopt different financial strategies for financing investments.

The first part of the analysis, based on a sample of 7,095 enterprises, determined that 42% of companies increased their investment activity during a five-year period (2014-2018). This proportion represents enterprises with extending investments, and not those that only renewed their current property (net investment). It was proved that most of the companies in the observed period preferred to finance the growth of fixed assets from their equity instead of debt. Almost half of these companies also invested into extending their property. Cressy and Bonnet (2018) consider that financial risk still plays an important role in the future decision of businesses.

The highest percentage of investing companies were in group A1, in the high or medium-high technological industry sector. The next part of the study defined eight types of company financial strategies with a different rate of risk and financial activity by using dynamic criteria (equity share criterion, current ratio criterion and golden rule of investing criterion). No harmful multicollinearity was found among these dynamic criteria. Based on these, it can be concluded that the first research question dealing with the possibility of determining company investments in the context of financial strategies, and at the same time defining the investment zone and the speculative zone can be confirmed.

This study found that there exists an almost balanced ratio between companies using conservative investment strategies and aggressive investment strategies. The most one-sided purely conservative and purely aggressive strategies were adopted by 35% of businesses, while one-third practised risky investment (long-term assets grow faster than sales). Bradrania et al. (2016) added that the use of riskier forms of corporate investment is also influenced by the ownership structure of the company. A quarter of investment companies were rather inclined towards the strategy with conservative elements in regard of the area of financing and aggressive elements regarding the golden rule of investing (strategy B). It was absolutely proved (second research question) that no type of investment strategy was completely predominant for enterprises according to different levels of technological intensiveness (Table 8). The enterprises in the high and medium-high manufacturing industries, the low and medium-low manufacturing industries, as well as less knowledge-intensive service industries did not utilise as many extreme aggressive financial strategies for financing their investment. On the other hand, knowledge-intensive services industries were using much more aggressive financing strategies. Silva et al. (2012) showed that knowledge-intensive service industries often focused on investment into innovation. Hansen and Winther (2011) documented that there was a strengthening of relational closeness between high and low-tech firms.

Knowledge of the concrete financial strategy of a company can influence managerial behaviour. In the case of a highly aggressive investment financing strategy, a company has to face higher risk with a possible impact on the operation of the company. Management should have a crisis plan for dealing with risky situations, and minimise the risk of using a conservative financial investment strategy, but the companies can stagnate as a result of inefficiently used resources. According

to Malmendier et al. (2011) managerial characteristics have a significantly strong power over companies' financing decisions.

The contribution of this paper is an extension of investment theory by the typology of company financial investment strategies. Another contribution is the consideration of the influence of the technological intensity of the company on the choice of financial strategy. This typology can be useful in making future investor decisions, for creators of subsidy policies to ensure efficiently allocating resources (Alina et al., 2020) and financial institutions providing financing for companies' investments. Low-tech companies (A2, B2) play an important role as partners in the innovation processes of high-tech companies (A1, B1) and as buyers of high-tech products. Therefore, the importance of enterprises operating in low-technology sectors (A2 and B2) should not be overlooked when formulating subsidy titles. The analysis of these businesses showed a predominant strategy B (aggressive investment rate), through subsidies the investment rate could be reduced. The right timing of investments or innovations is important (Dlask and Beran, 2016). The limitation of the research is found in the available data that allowed to analyse companies in the expansion phase of an actual business cycle (2014-2018 – the period of economic growth). The companies can have a different approach to financial risk in the recession phase of an actual business cycle. The authors plan further research in this area.

REFERENCES

- Alberg, J., Lipton, Z. C., *Improving factor-based quantitative investing by forecasting company fundamentals*, Preprint ArXiv:1711.04837, 2017.
- Alina, J., McGrath, R. D., Leitmanova, I. F., Petrach, F., *Using constraints in freight volume to identify regional needs for roadway infrastructure*, *Promet Traffic & Transportation*, 32(2), pp. 237-246, 2020.
- Bachmann, R., Bayer, C., *Investment dispersion and the business cycle*, *American Economic Review*, 104(4), pp. 1392-1416, 2014.
- Bai, C. G., Sarkis, J., *Improving green flexibility through advanced manufacturing technology investment: modeling the decision process*, *International Journal of Production Economics*, 188, pp. 86-104, 2017.
- Becker, P. M. (2010). *Asset allocation framework* [in:] Becker, M. P. (ed.), *Investing in microfinance: integrating new asset classes into an asset allocation framework applying scenario methodology*, pp. 5-23, Gabler, 2010.
- Begg, D., Ward, D., *Economics for business* (Fifth edition), McGraw-Hill Education, New York 2016.
- Beladi, H., Deng, J., Hu, M., *Cash flow uncertainty, financial constraints and R&D investment*, *International Review of Financial Analysis*, 76, Article 101785, 2021.
- Bontempi, M. E., *Investment-uncertainty relationship: differences between intangible and physical capital*, *Economics of Innovation and New Technology*, 25(3), pp. 240-268, 2016.
- Bradrania, R., Westerholm, P. J., Yeoh, J., *Do CEOs who trade shares adopt more aggressive corporate investment strategies?*, *Pacific-Basin Finance Journal*, 40, pp. 349-366, 2016.
- Chen, P.-F., Lee, C.-C., Zeng, J.-H., *Economic policy uncertainty and firm investment: Evidence from the U.S. market*, *Applied Economics*, 51(31), pp. 3423-3435, 2019.

- Chetty, R., *Interest rates, irreversibility, and backward-bending investment*, Review of Economic Studies, 74(1), pp. 67-91, 2007.
- Cressy, R., Bonnet, J., *The long-run impact of bank lending constraints and other economically important factors on SME failure*, International Review of Entrepreneurship, 16(3), pp. 289-328, 2018.
- Czarnitzki, D., Hottenrott, H., *R&D investment and financing constraints of small and medium-sized firms*, Small Business Economics, 36(1), pp. 65-83, 2011.
- Đlask, P., Beran, V., *Long-term infrastructure investment: A new approach to the economics of location*, E & M Ekonomie a Management, 19(3), pp. 40-56, 2016.
- Eurostat indicators on high-tech industry and knowledge intensive services, Annex 3 – High-tech aggregation by NACE Rev. 2. Aggregations of manufacturing based on NACE Rev. 2, http://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an3.pdf, 2018.
- Falcone, P. M., *Green investment strategies and bank-firm relationship: A firm-level analysis*, Econ. Bull, 38, pp. 2225-2239, 2018.
- Ferrando, A., Preuss, C., *What finance for what investment? Survey-based evidence for European companies*, Economia Politica, 35(3), pp. 1015-1053, 2018.
- Galloway, T. L., Miller, D. R., Sahaym, A., Arthurs, J. D., *Exploring the innovation strategies of young firms: Corporate venture capital and venture capital impact on alliance innovation strategy*, Journal of Business Research, 71, pp. 55-65, 2017.
- Gillespie, A., *Business economics*. Oxford University Press, Oxford 2013.
- Hall, B. H., Lerner, J., *Financing R&D and innovation*, [in:] Hall, H. B., Rosenberg, N. (eds.), *Handbook of the economics of innovation*, Vol. 1., pp. 609-639, 2010.
- Hall, B. H., Moncada-Paterno-Castello, P., Montresor, S., Vezzani, A., *Financing constraints, R&D investments and innovative performances: New empirical evidence at the firm level for Europe*, Economics of Innovation and New Technology, 25(3), pp. 183-196, 2016.
- Hansen, T., Winther, L., *Innovation, regional development and relations between high- and low-tech industries*, European Urban and Regional Studies, 18(3), pp. 321-339, 2011.
- He, L., Jiang, R., Bennett, M. M., *The rise of Chinese foreign direct investment in the United States: Disentangling investment strategies of state-owned and private enterprises*, Growth and Change, Vol. 51, Issue 4, pp. 1562-1587, 2020.
- Heizer, T., Rettig, L. R., *Top management team optimism and its influence on firms' financing and investment decisions*, Review of Financial Economics, Vol. 38, Issue 4, pp. 601-622, 2020.
- Higgins, R. C., Koski, J. L., Mitton, T., *Analysis for financial management* (Eleventh edition). McGraw-Hill Education, 2016.
- Hirschey, M., *Fundamentals of managerial economics*. South-Western Cengage Learning, Mason 2009.
- Howell, S. T., *Financing innovation: evidence from R&D grants*, American Economic Review, 107(4), pp. 1136-1164, 2017.
- Jorgenson, D. W., Griliches, Z., *The explanation of productivity change*, The Review of Economic Studies, 34(3), pp. 249-283, 1967.
- Konečný, Z., *Golden rules of financing related to the life cycle of Czech automotive firms*, Journal of Competitiveness, 5(2), 2013.
- Lara, J. M. G., Osma, B. G., Penalva, F., *Accounting conservatism and firm investment efficiency*, Journal of Accounting & Economics, 61(1), pp. 221-238, 2016.
- Lawrence, C. K., *Corporate value creation: an operations framework for nonfinancial managers*. Wiley, New York 2015.

- Lin, X. J., Wang, C., Wang, N., Yang, J. Q., *Investment, Tobin's Q, and interest rates*, Journal of Financial Economics, 130(3), pp. 620-640, 2018.
- Lososová, J., Zdenek, R., *Key factors affecting the profitability of farms in the Czech Republic*, Agris online Papers in Economics and Informatics, 6(665-2016-45008), pp. 21-36, 2014.
- Malmendier, U., Tate, G., Yan, J., *Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies*, Journal of Finance, 66(5), pp. 1687-1733, 2011.
- Montgomery, D. C., Runger, G. C., *Applied statistics and probability for engineers*. Wiley, New York 2007.
- Morellec, E., Valta, P., Zhdanov, A., *Financing investment: The choice between bonds and bank loans*, Management Science, 61(11), pp. 2580-2602, 2015.
- Mura, L., Buleca, J., Hajduova, Z., Andrejkovic, M., *Quantitative financial analysis of small and medium food enterprises in a developing country*, Transformations in Business & Economics, 14(1), pp. 212-224, 2015.
- Neely, A., *Business performance measurements – Theory and practice*. Cambridge University Press, Cambridge 2003.
- Novotná, M., Volek, T., *The capital intensity of manufacturing companies in Visegrad countries*, 14th International Days of Statistics and Economics, pp. 762–771, 2020.
- Raff, H., Ryan, M. J., *Firm-specific characteristics and the timing of foreign direct investment projects*, Review of World Economics, 144(1), pp. 1-31, 2008.
- Roychowdhury, S., Shroff, N., Verdi, R. S., *The effects of financial reporting and disclosure on corporate investment: A review*, Journal of Accounting and Economics, 68(2-3), Article 101246, 2019.
- Salehi, M., Daemi, A., Akbari, F., *The effect of managerial ability on product market competition and corporate investment decisions. Evidence from Iran*, Journal of Islamic Accounting and Business Research, 11(1), pp. 49-69, 2020.
- Scholleeová, H., *Investment controlling*. Grada Publishing, Praha 2009.
- Segarra, A., Teruel, M., *High-growth firms and innovation: an empirical analysis for Spanish firms*, Small Business Economics, 43(4), pp. 805-821, 2014.
- Silva, M. J. M., Simões, J., Moreira, J., Sousa, G., *Investment and expenditure on innovation activities and innovative capability: Empirical evidence from Portuguese services firms and KIBS*, International Business Research, 5(2), pp. 114-122, 2012.
- Stiebale, J., *The impact of cross-border mergers and acquisitions on the acquirers' R&D – Firm-level evidence*, International Journal of Industrial Organization, 31(4), pp. 307-321, 2013.
- Synek, M., *Managerial economics*. Grada, Praha 2011.
- Synek, M., Kislíngrová, E., *Business economics*. C.H. Beck, Praha 2015.
- Tanrisever, F., Erzurumlu, S. S., Joglekar, N., *Production, process investment, and the survival of debt-financed startup firms*, Production and Operations Management, 21(4), pp. 637-652, 2012.
- Tobin, J., *A General equilibrium approach to monetary theory*, Journal of Money, Credit and Banking, 1(1), pp. 15-29, 1969.
- Van Horne, J. C., Wachowicz, J. M., *Fundamentals of financial management*, Pearson Education Limited, Harlow 2009.
- Vrchota, J., Rehor, P., *Influence of strategies to determine the significance of the crisis by the managers of small and medium-sized enterprises*, Serbian Journal of Management, 12(1), pp. 53-63, 2017.

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