Economic determinants of the development and sustainability of family farms in Slovakia

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Abstract: The sustainability of the family business mirrors the business success and functionality of the family. Sustainability cannot be ensured without sufficient business profitability, solvency and financial stability. A company unable to pay its obligations on time is insolvent and, therefore, unhealthy. The paper's main goal is to evaluate the impact of selected economic aspects on the sustainability of family farms in Slovakia. The Finstat database serves as the source of input data for the research. For the economic analysis of the family and non-family sets of companies, Grünwald's bonity index (GIB) was chosen for its universality. According to the Ministry of Economy of the Slovak Republic, family businesses can be considered less risky, especially considering the conservative way of management and the effort for long-term sustainability. However, the results of our research may differ. Family businesses show higher profitability of total and mainly equity capital but also low current liquidity and an undercapitalised state. The most increased non-credit current liquidity was achieved in family businesses in the pandemic years 2020 and 2021. The family businesses we monitored are more profitable than non-family businesses, they do not show an excessive increase in investments, and most of them seem to have a targeted and purposeful high level of short-term liabilities.

Keywords: economic aspects; family business; Grünwald index of bonity; sustainability

For a comprehensive corporate sustainability strategy, it is necessary to consider all aspects, their consequences and mutual relationships. According to Roca-Piug (2019), economic sustainability is associated with cost-cutting, saving precious resources for future generations and better resource management. Boards of directors of high sustainability firms are more likely to be formally responsible for sustainability, to have top management financial incentives that are a function of sustainability metrics, to have established processes for stakeholder engagement, to be more long-term oriented, and to exhibit higher measurement and disclosure of nonfinancial information (Hall and Wagner 2012).

Responsible, or more precisely, sustainable entrepreneurship is essential for both large and small business-

es, which can improve their economic characteristics in the short and long term through innovative products and services, new capabilities, and stakeholder involvement. Every organisation must monitor its processes and reduce costs to succeed in a competitive environment (Vrabcová and Urbancová 2023).

Family firms behave and perform differently than other firms (Berzins et al. 2018). The family firm is said to have a special responsibility for society since it does not correspond to the ideal-typical *homo economicus* idea of a purely objectively acting business, but on the contrary, due to its special endowment with family-related, i.e. not (directly) economic characteristics, has a greater significance and responsibility for individual persons, groups and their overall environment (Clauß et al. 2022). The whole existence of family businesses is characterised by a duality of the family and business dimensions, which remains the case in their financial affairs. The financial decisions in family businesses are affected by aspects involving a duality of goals rather than exclusively profitability, the simultaneous presence of family and business financial needs, and the preferential handling of family needs at the expense of business needs (Csákné et al. 2016).

Economic sustainability is implemented through individual tools that help the family business progress and prosper. Existing evidence significantly increases confidence in the strategic benefits of sustainability (Clauß et al. 2022). For family businesses to face the current challenging environment, they need to be able to quickly reconfigure existing resources and often change the common habits to maintain their competitive advantage, and this is where the problem usually arises (Zapata-Cantu et al. 2022).

Sustainable family businesses positively impact the country's economy and provide financial security to family business owners (Cole 1997). The important sustainability factors identified in the study of Chirapanda (2020) are key steps for achieving family business succession. In the case of family businesses, both market and technology orientation are important drivers of performance; the focus on financial and market performance indicators positively impacts performance, while the focus on efficiency indicators diminishes the performance of family businesses (Vlasic 2023). Economic aspects that affect sustainability are related to performance and have to do with the change of organisational culture adapted to business orientation, intergenerational knowledge transfer, investment in innovation, or internationalisation strategies (Herrera et al. 2020).

Entrepreneurial orientation is significantly and positively related to investments in sustainability initiatives. The generation of the family business is moderately related to sustainability investments, with later-generation family firms investing more (Mullens 2018). Family firms are also often described as conservative, risk-averse and reluctant to change (Gómez-Mejía et al. 2007; Calabrò et al. 2019). Finances and property are a sensitive topics for every family, which is also the case for a family business. Family firms are more labour-intensive, and small family firms are particularly liquid, risky, and young. The financing and dividend policy is similar in family and nonfamily firms (Berzins 2018). Cooper and Artz (1995) claim that if a family business gets into a difficult economic situation where the company is over-indebted, yet it still survives, in most cases, it is the merit of the family and functional family management.

The long-term health of a family business and its sustainability depends, according to Ward (2011), on its ability to anticipate and respond to changes. The financial structure of a family firm changes with the size of the business and the firm's life cycle, and the variables that explain the financial behaviour of the family firms have different levels of importance, depending on the size of the business and the firm's life cycle (Acedo-Ramirez et al. 2017). Family-owned businesses have a lower financial structure than those of non-family-owned businesses. Family firms manage their business operations with lower risk and are generally healthier financially than their counterpart firms (Agbor Tabot Ntoung et al. 2020). Family businesses – their entrepreneurial values, personal leadership, and the family's name with the intent of succession – are more oriented towards financial sustainability than non-family businesses (Sági et al. 2020). When family businesses reach medium size (in terms of employment, asset value and operating revenue), they are predicted to be more financially stable than non-family businesses (Sági et al. 2020).

To anticipate the development trends, it is essential to evaluate the economic, social and environmental sustainability of farms (Savickienė and Miceikienė 2018). Due to the Common Agricultural Policy's (CAP) support, the average income of farms has approached the average non-agricultural income. Still, the distribution of this support favoured the largest farms, increasing disparities within the sector (Guth et al. 2020).

There are many discussions about developing and ensuring the sustainability of family businesses in Slovakia (Storey 2016). According to Zahm et al. (2008), economic sustainability is close to the concept of via-

bility, which focuses on analysing whether agricultural activity provides a decent professional and personal life for farmers and their families. The wish of family farm owners is for the business to provide economic stability (Le Breton-Miller and Miller 2018). It is not possible to ensure strong business without economic stability. According to Latruffe et al. (2016), economic viability is mainly measured by profitability, liquidity, stability and productivity, but Argiles (2001) argues that assessing viability through financial indicators is financial viability and not economic viability. Ryan et al. (2016) state that farm-level sustainability measures capture the broad concepts of factors' productivity, profitability, market orientation and viability. The component obtained by applying principal component analysis to indicators of efficiency, factors profitability, and income capacity was used to assess Italian farms' sustainability levels and analyse how efficiency and income issues are related to each other in defining the overall economic sustainability (Coppola et al. 2022).

Based on the analysis of sources, we formulated four research assumptions below:

RA_1: The financial profitability of family farms, measured by total capital and equity profitability, is at a higher level than in non-family enterprises.

RA_2: Family businesses' short-term liquidity is lower than non-family businesses.

RA_3: The financial stability of family businesses is higher than in the set of non-family businesses.

RA_4: Family businesses demonstrate stronger financial health than non-family businesses.

MATERIAL AND METHODS

The paper's main goal is to evaluate the impact of selected economic aspects on the sustainability of family farms in Slovakia. Due to the absence of a law on family businesses and the lack of a database of family businesses in Slovakia at the time of our research (June – Nov 2022), we drew input data from the Finstat database (a paid online platform with data on Slovak businesses, a database of businesses and their progress, company profiles, financial statements and datasets) in the following way. In the Finstat database, we generated all agricultural enterprises in Slovakia, regardless of their size, and then by matching a maximum of two surnames in the company's administrative bodies and membership in the statutory body, we concluded that it is a family business. This method is called the involvement criterion (Chrisman et al. 2005), and its essence is the matching of family members' surnames in the company's administrative bodies.

As part of the research, we analysed and then compared 50 family and 50 non-family agricultural businesses over 9 years period (monitored period from 2013 to 2021). For the economic analysis of the mentioned two sets of companies, the Grünwald index of bonity (*GIB*), according to Pech et al. (2020), was chosen for its universality. This index is quite common in the Czech Republic and is widely used to evaluate the financial health of companies. It comprises the arithmetic mean of six ratio indicators, which are based on generally valid standards and are suitable for analysing a set of all companies with different sizes, areas of operation or capital structures. Unlike Pech et al. (2020), for better comprehensibility, we expressed the calculations of the proportional indicators of the equation separately. This is what makes the GIB a universal equation suitable for this research, and we can express it by the following Equation (1):

$$GIB = \frac{1}{6}\left(\frac{\frac{ROA}{a} + \frac{ROE}{e} + \frac{CFCL}{l} +}{\frac{CINWC}{p} + \frac{DCCF}{t} + \frac{IC}{u}}\right) \tag{1}$$

where: *ROA* – return on total assets; *ROE* – return on equity; *CFCL* – credit-free current liquidity; *CINWC* – covering inventory with net working capital; *DCCF* – debt coverage with cash flow; *IC* – interest coverage; *a, e, l, p, u* – threshold-minimum values that compare the recommended values with the actual value of the enterprise (for each indicator in the equation, it is favourable for its value to be at least level 1); *a* – average interest rate on received loans in %; *e* – average taxed interest rate on accepted liabilities; *p* – threshold minimum value = 0.7; *l* – threshold value of the credit-free current liquidity = 1.2; *t* – threshold minimum value = 0.3; *u* – threshold minimum value = 2.5.

We evaluate the area of profitability, liquidity and stability of each agricultural enterprise of the research sample, Equations (2–7):

$$ROA = \frac{EBIT}{\text{assets}} \times 100 \; [\%] \tag{2}$$

where: *EBIT* – profit before interest and taxes; threshold value.

$$ROE = \frac{EAT}{\text{equity}} \times 100 \; [\%] \tag{3}$$

where: *EAT* – earnings after tax; threshold value.

$$CFCL = \frac{\text{short-term receivables + short-term financial assets + financial accounts}}{\text{short-term liabilities}} \tag{4}$$

$$CINWC = \frac{\text{current assets-long-term receivables – short-term liabilities – short-term loans and financial aid}}{\text{inventory}} \tag{5}$$

$$DCCF = \frac{EAT + \text{depreciation}}{\text{debts}} \tag{6}$$

$$IC = \frac{EBIT}{\text{interest expenses}} \tag{7}$$

The sum of all *GIB* ratio indicators, divided by the arithmetic mean, is the resulting value of each enterprise in points. We then classified them into one of the levels of the company's financial health (A–D), where the least number of points is 0, and the maximum is 3 points:

i) A – solid health; *GIB* = 2.0 or more points. Another condition is that the minimum value of the assigned points for all individual scored indicators is 1 point;

ii) B – good health; *GIB* = 1.0 to 1.99 points, while another condition is that the number of points obtained in assessing credit-free current liquidity and interest coverage should be at least 1 point in both cases;

iii) C – weaker health; *GIB* = 0.5 to 0.99 points, while another condition is to obtain at least 1 point for credit-free current liquidity;

iv) D – poor health; *GIB* less than 0.5 points.

For a better overview, we categorised the values into four quartiles within the monitored set based on the size of the values of the ratio indicator taken from the *GIB* equation. In the research analysis, we will use the value of the first and third quartiles from the set of monitored indicators for all businesses. Subsequently, we will use the median value of the first and third quartiles for the entire analysed period to compare family and non-family businesses.

Student's *t*-test was applied to confirm or reject the formulated research assumptions. Statistical hypotheses were formulated as follows:

H_0: We assume no significant difference exists between the mean values of the two monitored sets of family and non-family businesses.

H_1: The mean values of the two monitored sets of family and non-family businesses are significantly different.

It is true that if the *P*-value is greater than the significance level α = 0.05, we do not reject the null hypothesis H_0 and if the p-value is less than the significance level α = 0.05, the difference is obvious (significance*). The difference is highly significant if the *P*-value is less than α = 0.01 (significance**).

According to our findings and the paper's main goal, to evaluate the impact of selected economic aspects on the sustainability of family farms in Slovakia, we will conclude, that chosen economic indicators are important for the sustainability and growth of family businesses.

RESULTS AND DISCUSSION

One of the main determinants of the economic sustainability of family farms is the company's solvency. Insolvency is one of the decisive factors threatening the stability of the company. If a company cannot pay its obligations on time, we say that the company is insolvent. Therefore, we cannot call it a healthy company financially. When we talk about the financial performance of the company, we consider the volume of the company's assets, indebtedness, volume of sales, costs and revenues, as well as the result of management.

The business can be regarded as healthy when showing satisfactory liquidity and profitability at the same time. The sustainability of businesses cannot be ensured without sufficient business profitability, solvency and financial stability.

Profitability, which is a key criterion for the financial health of an enterprise, was expressed in the first research hypothesis:

RA_1: The financial profitability of family farms measured by the profitability of total capital *ROA* and equity *ROE* is at a higher level than in the set of non-family enterprises.

Analysing the first ratio indicators of *GIB*, Equation (1), we verified the validity of the first research assumption, which we subsequently verified with the selected statistical method, the Student's *t*-test.

The highest average value of *ROA*, Equation (2), of family businesses was reached in 2015 at the amount of 3.74%, and the lowest value in 2013 at the amount of 0.33% [see Figure S1 in the Electronic supplementary material (ESM)].

Approximately half of the family businesses achieved an average *ROA* value of –0.08% to 8.94% during the research period. A quarter of the total number of family businesses shows *ROA* higher than 8.94%, and the same number of businesses showed *ROA* of –0.08% and lower.

The annual median *ROE*, Equation (3), of family businesses, tended to increase. The median *ROE* for the entire analysed period for all companies of the group is at the level of 6.03%, which is 3.83 percentage points more than the mean value of *ROA* of the same group of companies (2.20%). Approximately a quarter of the analysed family businesses achieved *ROE* of 23.48% and higher, but on the other hand, there are about 25% of entities showed a negative *ROE*, at the maximum level of –2.05%.

We quantified the comparative indices as the ratio of the profitability indicators of family businesses to the profitability indicators of non-family businesses. The median *ROA* in the set of family businesses was 1.36 times higher, and the mean value of *ROE* was up to 4.02 times higher compared to the set of non-family companies (Figure S2 in the ESM).

We verified the financial analysis results using the statistical method of Student's *t*-test, the P for *ROA* = 0.1715 and the P for *ROE* = 0.0048**. Although we found out from the results of the financial analysis that the mean value of both *ROA* and *ROE* is higher in favour of family businesses, the Student's *t*-test did not confirm these results for the *ROA* indicator. The *ROE* is highly significant, but the *ROA* of the mean values in both sets is not statistically significant, and therefore this research assumption cannot be confirmed.

For analysing short-term liquidity, we focused on two other GIB equation ratios: credit-free current liquidity and covering inventory with net working capital. The second research assumption is as follows:

RA_2: Family businesses' short-term liquidity is lower than non-family businesses.

The development of the mean values of short-term liquidity indicators for a set of family and non-family businesses. The median for the analysed period 2013–2021 is 1.07. In the pandemic year 2020, the annual median for non-credit current liquidity of family businesses reached 1.25, which is more than its marginal value of 1.2 (Figure S3 in the ESM).

The median of inventory coverage by net working capital was 0.02 over the entire period within the family business set. 32% of entities showed an average value of *CINWC*, Equation (5), at 0.7 and higher.

We subsequently confirmed the second research assumption regarding short-term liquidity using the Student's *t*-test statistical method. The *P* for credit-free current liquidity, Equation (4), of both monitored sets is at 0.2135, and the *P*-value for *CINWC* is 2.978E–10**, which is highly statistically significant. As with the previous research hypothesis, we cannot unequivocally confirm this research hypothesis statistically since no statistically significant difference was demonstrated for *CFCL* within the observed sets.

The last two ratios of GIB, debt coverage with cash flows and interest coverage, are aimed at evaluating companies' financial stability. We, therefore, included financial stability in the third research assumption:

RA_3: Financial stability of family businesses is higher than in the set of non-family businesses.

The mean value of the statistical set for the entire monitoring period was at the level of 0.13. Not even in a single year of the monitored period did the annual average of *DCCF*, Equation (6), in the set of family businesses reach the marginal minimum of 0.3. Only a slightly more favourable situation in terms of the development of *DCCF* was in the set of non-family businesses, where only in 2014 the annual average value of the indicator (0.40) exceeded the marginal value of 0.3, and the average value of this indicator for the entire period, 0.19, was only slightly higher than the average value in the set of family businesses at the amount of 0.13 (Figure S4 in the ESM).

The development of the annual medians of interest coverage, Equation (7), for the monitored period in the set of family businesses, was relatively stable. The median value for the entire set during the analysed period is 2.26. Up to 25% of enterprises show an interest coverage value of 0.22 and lower, and a quarter of enterprises achieve an interest coverage value of 4.90 and higher. In the pandemic year of 2020, the annual median of this indicator in the set of family businesses was 0.48 lower than the average value of the given indicator for the analysed period. In 2021, the annual average was already at the marginal minimum. The annual medians of interest coverage development in the set of non-family businesses are fluctuating. More than half of the set of non-family companies showed an average interest coverage higher than 2.01.

The development of comparative indices, the value of which, except for the years 2015 (1.28) and 2020 (1.06), is less than 1. This proves that only in two of the nine indicated years the indicator proved to be more favourable in the set of family businesses. The comparative index of the average *DCCF* value of the compared companies (0.67) confirms the one-third difference standing against family businesses (Figure S5 in the ESM).

Like the previous research assumptions, we also verified this one using the statistical method of Student's *t*-test, where the *P* for *DCCF* = 0.058, and the P for interest coverage = 0.267. This means there is a significant statistical difference between the mean values of both observed sets in the case of *DCCF*. In the case of interest coverage, no statistical difference between the mean values within the monitored files was demonstrated. Therefore, the third research assumption cannot be confirmed.

The last – fourth – research assumption deals with the financial health of family and non-family businesses considering the above results of the financial analysis. RA_4: Family businesses demonstrate stronger financial health than non-family businesses.

The share of healthy enterprises consists of the total number of businesses with solid and good health over the total number of enterprises in the respective set of monitored businesses. For nine years, we separately diagnosed the financial health of each set of enterprises in 450 cases. In the set of family businesses, we analysed 29.56% of healthy businesses, of which only 4% were businesses with solid health (Figure S6 in the ESM). We have businesses with good health accounting for 25.56%. 70.44% are referred to as sick enterprises, while 32.22% had the financial health of the enterprise assessed as weaker health and 38.22% have the status of the poor enterprise (Figure S7 in the ESM).

In the research sample of non-family businesses, 28.89% of businesses were labelled as healthy businesses, i.e. 0.57 percentage points less than family businesses. More significant but only slight differences between family businesses were reported in the representation of businesses with solid health and good health. We register 8% of non-family businesses with solid health and 20.84 businesses with good health, i.e. 4.67% less than in family businesses (Figure S6 in the ESM).

The difference in the financial health of both sets of businesses is very close. But let's compare the representation of healthy and sick businesses during the nine-year analysis period. The financial health of family businesses is evaluated more favourably. However, at the same time, it must be noted that we observed differences within the internal structure of healthy enterprises (solid vs good health) as well as in the internal structure of sick enterprises (weaker health vs illness) within the analysed files.

Based on the analysis of the financial health of family and non-family businesses evaluated by the methodology of the Grünwald index of bonity, we could note a greater representation of healthy businesses within their total number being analysed. Our research concludes that family businesses demonstrate stronger financial health than non-family businesses. According to the paper's main goal, to evaluate the impact of selected economic aspects on the sustainability of family farms in Slovakia, we can conclude that chosen economic indicators are important for the sustainability and growth of family businesses.

Building on the research by Kowalewski et al. (2010), applied to 217 family businesses, it was found that through *ROA* and *ROE*, family businesses show higher performance than non-family businesses. Some authors, including Spicka et al. (2019), believe that it is inappropriate to evaluate the performance of an agricultural enterprise through *ROA* because the phenomenon prevails in the agricultural sector when the price of the farming land is not a part of the accounting asset value. Pech et al. (2020) consider the profitability of assets to be the same as that of capital, which represents the resources for which the property was acquired at its accounting value. However, the theory and practice of economic efficiency of capital investment refer to different approaches to increasing the economic efficiency of capital investment in business. One way is, e.g. property rental and its specific form of procurement, leasing. The evaluation of the efficiency of capital investment works with alternative when for the same property value, the property procured and used in the business has a different economic and utility value. And then, it is more adequate to talk about the efficiency of using capital as an asset. Measuring business performance by the profitability of total capital is more appropriate, regardless of the share of one's own and foreign capital. In contrast, the profitability of one's capital is affected by financial leverage.

We noted the biggest differences in the profitability indicators of family and non-family businesses between 2014 and 2018. The median *ROA* was 1.36 times higher in the set of family businesses, and the mean value of *ROE* was more than four times higher. The Student's test in *ROA* analysis, comparing the difference in the averages of both compared groups, points to an insignificant difference between the two compared groups, therefore, we cannot unequivocally confirm the results of higher profitability in the group of family businesses. However, when testing the *ROE* sets in family and non-family businesses, we found a rather significant difference in the compared statistical sets of values. With these results, we can support those researchers who confirm a higher return on equity in family businesses, which was positively determined by financial leverage.

According to Davis (2018), in family businesses, a great emphasis is placed on the tradition of business on the effect of business activities in the form of profit, not to get rich as quickly as possible, but to establish a stable and sustainable business. Insolvency is one of the decisive factors threatening the stability of the company. If a company is insolvent and does not pay its obligations on time, such a company cannot be considered financially healthy. The golden balance rule has become a well-known one, the observance of which is evaluated during the balance sheet analysis. Complying with this rule forms the basis of maintaining the company's permanent solvency. The desired state is overcapitalisation, which occurs when long-term capital not only participates in financing long-term assets but also finances short-term assets. The opposite situation threatens the company's financial stability (Allen and Wood 2006; Pantielieieva et al. 2020).

CONCLUSION

The *de minimis* aid scheme of the Ministry of Economy of the Slovak Republic emphasises that family businesses can generally be considered less risky, mainly due to a conservative way of management and the effort for long-term sustainability. The results of our research refute this general viewpoint. We found that family businesses need to be more recapitalised. We prove it by the development and state of non-credit current liquidity and by covering inventories with net working capital. Family businesses show higher profitability of total and mainly equity capital but also low current liquidity and an undercapitalised status. Notably, the highest non-credit current liquidity was achieved in family businesses in the pandemic years 2020 and 2021. Especially businesses with a high *ROA* have a good chance of reaching the required solvency. This may not be the case due to an excessive renewal of non-current assets, the extent of which does not correspond to the company's performance, but also when the company intentionally manages the period of payment of liabilities and the period of collection of receivables to obtain cash at the expense of unpaid short-term liabilities. Free cash flows received in this way can be used to purchase non-current assets or be drawn from the family business into separately maintained family accounts. The family businesses we monitor are more profitable than non-family businesses, they do not show an excessive increase in investments, and most of them seem to have a purposefully and exceptionally high level of short-term liabilities. We can le-gitimately assume that the absence of recorded inventory of production or unfinished production and the low level of cash is the result of intentional and sophisticated management procedures of the family business. Due to the scope and difficulty of the research, we did not have the opportunity to verify this hypothesis, but we consider it an advantageous topic for future research into the economic determinants of the success and sustainability of family businesses operating in the agricultural sector.

We quantified, monitored and evaluated the Grünwald index of bonity through the basic ratio indicators of the financial health of family businesses. At the same time, the individual indicators of the three pairs of indicators of this model enabled us to separately evaluate the financial performance of companies, their liquidity, and the financial stability of business entities.

The research results can be used within the framework of other subsequent scientific research into the family business. They can also serve as a basis for establishing the concept of the development of family farms in the Slovak Republic and be helpful to business management when increasing the economic stability and sustainability of family farms.

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