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Post-recession business growth: impact on ROE in the long and short term

Crecimiento empresarial post-recesión: impacto en ROE a corto y largo plazo

Vladislav Spitsin
Professor at Universidad Politécnica Nacional Tomsk, Rusia
spicynvv@tpu.ru
https://orcid.org/0000-0002-8360-7590

Marina Ryzhkova
Professor at Universidad Politécnica Nacional Tomsk, Rusia
marybox@tpu.ru
https://orcid.org/0000-0002-0107-8016

Lubov Spitsina
Professor at Universidad Politécnica Nacional Tomsk, Rusia
spicyna@tpu.ru
https://orcid.org/0000-0002-3923-984X

Victoria Leonova
Professor la Universidad Politécnica Nacional Tomsk, Rusia
vap60@tpu.ru
https://orcid.org/0000-0002-9660-4356

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Abstract: at the beginning of the current century, the world economy experienced several crisis events that negatively influenced business performance. Many businesses have experienced long periods of declining sales. This paper continues the series of scientific works on the study of restarting growth, i.e., the growth of companies after a long period of stagnation or falling sales. The paper contributes to the world literature by analyzing the impact of different types of restarting growth on firm performance (firm's return on equity – ROE). The panel data includes 7528 observations (1882 firms * 4 years). Regression models with fixed effects are used for data analysis. The study revealed a positive impact of long-term growth on ROE, but it did not confirm the impact of short-term growth on ROE. The maximum benefits accrue to young companies with long-term fast sales growth. Empirical studies provide varying results on the impact of growth on firm profitability. Our approach reconciles these contradictions and shows that sustainable long-term growth allows firms to achieve higher profitability. These results will be of interest for investors, who should focus on finding companies that can demonstrate annual sales growth for several years. It is also advisable for owners and managers to strive for long-term annual growth in firm sales.

Keywords: fast-growing firms, restarting growth, firm performance, ROE, panel data analysis.

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Resumen: a principios del presente siglo, la economía mundial experimentó varios eventos de crisis que afectaron negativamente el desempeño empresarial. Muchas empresas han atravesado largos períodos de reducción de las ventas. Este artículo continúa la serie de trabajos científicos sobre el estudio del reinicio del crecimiento, es decir, el crecimiento de las empresas después de un largo período de estancamiento o caída de las ventas, y contribuye con la literatura mediante el análisis del impacto de diferentes tipos de reactivación del crecimiento en el desempeño de las empresas (rendimiento sobre el capital de la empresa-ROE). Los datos de panel incluyen 7528 observaciones (1882 empresas * 4 años). Para el análisis de datos se utilizan modelos de regresión con efectos fijos. El estudio reveló un impacto positivo del crecimiento a largo plazo sobre el ROE, pero no confirmó el impacto del crecimiento a corto plazo sobre el ROE. Los máximos beneficios los obtienen las empresas jóvenes con un rápido crecimiento de las ventas a largo plazo. Los estudios empíricos arrojan resultados variables sobre el impacto del crecimiento en la rentabilidad de las empresas. Nuestro enfoque muestra que el crecimiento sostenible a largo plazo permite a las empresas lograr una mayor rentabilidad. Estos resultados serán de interés para los inversores que deberían centrarse en encontrar empresas que puedan demostrar un crecimiento anual de las ventas durante varios años. También se recomienda que los propietarios y gerentes se esfuercen por lograr un crecimiento anual a largo plazo en las ventas de la empresa.

Palabras claves: empresas de rápido crecimiento, reactivación del crecimiento, desempeño empresarial, ROE, análisis de datos de panel.

Introduction

Many scholars focus on the study of young and fast-growing firms. This approach is justified in a growing economy, when new firms are more promising and are gradually replacing unsuccessful businesses and older companies (Boscán Carroz *et al*., 2023). However, at the beginning of the 21st century, the world economy and many countries experienced long periods of stagnation and a number of acute crisis events that negatively influenced business performance. Many businesses have experienced long periods of declining sales (Sabek and Horák, 2023); they cannot be replaced by new companies because their ability to generate new business is limited.

An urgent scientific problem arises in the study of restarting growth, i.e. the growth of companies after a long period of stagnation or falling sales. This problem is insufficiently studied in the world economic literature. According to the organizational life cycle theory, it is traditionally believed that the period of growth passes into a period of maturity, followed by decline, decreased sales and the collapse of the company (Adizes, 2004). However, there are a number of studies presuming that the companies have a chance to resume growth. These studies are fragmented and they consider only individual factors of restarting growth: entrepreneur personality (Hegarty *et al*., 2020; Saadi *et al*., 2023), technological innovation and business process improvement (Süß *et al*., 2021; Nyvall *et al*., 2023), collaborations and major projects (Ullberg, 2023), etc. Such work and growth factors are systematized in (Spitsin *et al*., 2024).

This paper continues the series of scientific works on the study of restarting growth, i.e. growth of companies after a long period of stagnation or falling sales. Four types of restarting growth of firms are identified and analyzed: moderate long-term growth (MLTG), fast long-term growth (FLTG), moderate short-term growth (MSTG), fast short-term growth (FSTG). The paper investigates the impact of these types of restarting growth on a firm's financial performance (return on equity (ROE)). Using a sample of 1,882 firms, this study models both the direct effects of different types of restarting growth on ROE and the moderation effects of the interaction of growth types with firm age.

The scientific novelty of the paper is that it develops a new and little-explored scientific area, related to the restarting growth of firms after a long period of falling sales, and assesses the impact of different types of growth on the profitability of the company. The theoretical contribution will be in the identification of patterns of the influence of restarting growth on the profitability of the company. In practical terms, these patterns will be of interest to the economies of countries that have experienced acute crisis events or long periods of stagnation or recession, as well as to the investors who are assessing the feasibility of investing in enterprises with restarting growth.

Literature review

The scope of this paper lies at the junction of two research areas. On the one hand, this is the theory of rapid growth of companies; on the other hand, this is the impact of growth on the

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profitability of the company. They are described in detail below.

Fast-growing companies and companies with restarting growth

Fast-growing firms have been the focus of economics for a long time (Grover Goswami *et al*., 2018; Nightingale and Coad, 2014). Scientists identify and study several types of such firms: young gazelle firms, adult scale-ups, etc. (Piaskowska *et al*., 2021). However, the phenomenon of firm growth after stagnation or falling sales (restarting growth) remains poorly studied in modern science. Economists consider cyclical development in relation to countries or local areas. However, in the case of enterprises, they use the concept of the organizational life cycle of a company's development, which traditionally assumes that the life cycle ends with company closure (Adizes, 2004). Some scientists are considering the possibility of a company, moving towards restarting growth, and highlighting certain factors that may determine such growth:

- Entrepreneur Personality (Hegarty *et al*., 2020; Saadi *et al*., 2023).
- Technological innovation and business process improvement (Süß *et al*., 2021; Nyvall *et al*., 2023).
- Market expansion (Vertakova *et al*., 2016).
- Entrepreneurial social networks (Anis *et al*., 2018).
- Collaborations and major projects (Forrest *et al*., 2021; Beria, 2022; Ullberg, 2023); etc.

These are fragmentary studies of individual growth factors, while a comprehensive and detailed study of the phenomenon of restarting growth is just beginning (Spitsin *et al*., 2024). The critical significance of this phenomenon is due to the cyclical nature and crisis events of the world economy, which manifested themselves at the beginning of the 21st century (global financial crisis, increased political tension, economic sanctions, Covid-19 pandemic, etc.) (Vuković *et al*., 2017; Kohler and Stockhammer, 2021).

Under these conditions, many companies experienced long periods of declining sales. The share of such companies is large (in the case of Russia, it exceeded 25% according to Spitsin *et al*., 2022), and they cannot be quickly replaced by the generation of new business. The transition of such companies to restarting growth will contribute to the economic recovery of countries and local areas and will be of interest to investors who will receive new objects for financing.

There are several myths, regarding what the characteristics of high-growth firms are (Brown *et al*., 2017). Particularly, they are: 1) young and small, 2) high-tech-oriented, 3) originated from a university, 4) based on venture capital and some other. But when trying to analyze data on fast-growing firms in developed countries, we are aware that these myths are not confirmed.

There are two pressing scientific problems: identifying growth factors and assessing the financial results of growth. This paper focuses on the second issue and assesses the impact of restarting growth on firm profitability. The study suggests that the different types of restarting growth, outlined above, may have different impacts on profitability.

There are several approaches to the fast-growing companies' identification. Mainly, researchers employ the Absolute approach (OECD, 2008), the Relative approach (Haltiwanger *et al*., 2016), and the firms' growth distribution approach (Halvarsson, 2013). We implement the first one and identify high growth as an annual sales growth with the rates that are more than 20% per annum. These criteria were modified, taking into account the economic problems in Russia, caused by political tensions and economic sanctions. Developing the criteria and growth types, proposed by (Spitsin *et al*., 2022), the study encompasses four types of post-stagnation growth:

- Fast long-term growth (FLTG): firms of this type show an annual sales growth of more than 20% annually for three or four out of four years after a stagnation period. The total sales growth for these four years is more than 60%.

- Moderate long-term growth (MLTG): annual sales of these firms grow at a rate above 10% during the same period, as in the case of FLTG; but their total sales rates for four years are in the range of 30-60%.
- Fast short-term growth (FSTG): total sales growth of such firms over four post-stagnation years should exceed 60% at an annual sales growth rate of more than 20% for no more than two of four post-stagnation years.
- Moderate short-term growth (MSTG): total sales growth for four years goes beyond 30% at an annual sales growth rate, exceeding 10% for no more than two of four post-stagnation years, and these companies were not included in the group of FSTG firms.

The types of growth are summarized in Table 1.

Table 1
Restarting growth types: Rates and periods of growth

Growth	total sales growth over four post-stagnation years	long-term post-stagnation period	short-term post-stagnation period
Fast	exceeding 60%	above 20% per year	above 20% per year
Moderate	exceeding 30%	above 10% per year	above 10% per year

For the firms that satisfy these criteria, a dependent variable (1) was assigned. Otherwise, the value was 0. This classification is critical for the methodology.

Sales growth and company profitability

Main goals of a company's development are sales growth and profitability, which are often considered alternative. The first of them is a goal, based on a management position (Piaskowska *et al*., 2021); the second is a goal, proceeding from an economic position (Revilla and Fernandez, 2013).

- Empirical research on sales growth and profitability follows two paths:
- Econometric modeling the relationships between these variables (Federico and Capelleras, 2015).

Grouping the firms in the coordinates "sales growth - profitability" and studying the transition of firms between groups (Zhou *et al*., 2013).

The traditional economic theory assumes that sales growth should lead to an increase in the firm's profitability. According to the economies of scale, profit growth occurs due to constant fixed costs. However, despite the often-assumed linear positive relationship between these indicators, empirical research results are surprisingly inconsistent. When some studies report this relationship as positive (Federico and Capelleras, 2015), others suggest a negative association between sales growth and profitability or do not find a statistically significant relationship between them (Jang and Park, 2011). If performance of gazelles is compared with non-gazelles' indicators, the first have significantly higher EBIT, operating income, cash flow from operation, change in net operating assets (Blomkvist and Paananen, 2017).

The impact of firms' restarting growth on profitability has not currently been studied in world economic science. It will be of great importance to assess the financial results of restarting growth for the economies of countries and local areas, as well as for investors who have invested in such firms.

This paper makes the following contributions to two research areas that were described above:

It develops the theory of rapid growth by analyzing the financial consequences of rapid growth of a firm. We can expand this theoretical direction by considering not only the phenomenon of rapid growth, but also its impact on effi-

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ciency (firm profitability) and provide estimates for different types of rapid growth.

It offers an approach that allows scientists to reconcile the tensions between growth and firm profitability described above. This study suggests and proves that different types of growth have different effects on profitability. In addition, the profitability of a firm is affected by the age of the enterprises that demonstrate different types of rapid growth.

Development of research hypothesis

First, let us test hypotheses about the impact of different types of growth on profitability. Many scholars note that sales growth should have a positive effect on the profitability of firms. Sales growth typically leads to a more favorable cost structure due to economies of scale, which, in turn, improves firm profitability (Steffens *et al*., 2009). Many empirical studies support this assumption and document the direct correlation between sales growth and profitability (Federico and Capelleras, 2015).

However, sales growth is not always translated into higher profit margins for the following reasons:

- The change in scale leads to new challenges and requires significant organizational changes that firms' management teams may not be equipped to cope with adequately. Markman and Gartner (2002) report no significant relationship between rapid (extraordinary) growth and profitability for young firms.
- Companies try to choose the most profitable projects for expansion. However, to sustain growth, they inevitably turn to less profitable projects, which jeopardizes further gains in profitability (Davidsson *et al*., 2009).
- The growth of companies increases the strain on and complexity of their organizational structures, and reduces the ability of managers to control costs, driving profitability down (Jang and Park, 2011).

These reasons lead to the fact that in several studies, scientists may not find a significant effect of sales growth on profitability or, on the contrary, identify a negative relationship between them.

However, we believe that these reasons only apply to very rapid (extraordinary) sales growth. In this case, we should talk about the absence or negative relationship between growth and profitability. Such extraordinary growth is shown by companies with short-term restarting growth. Indeed, they should show an increase in sales for the year of about 30% or more (MSTG) or about 60% or more (FSTG). In this case, the negative factors may outweigh the benefits of growth. In the case of long-term annual growth, we expect low annual sales growth rates of about 10% (MLTG) or about 20% (FLTG). Low growth rates will allow firms to benefit from growth and will not lead to the implementation of negative factors.

Accordingly, we can formulate the following hypotheses:

Hypothesis 1.1. Long-term restarting growth will lead to increased profitability of firms.

Hypothesis 1.2. Short-term restarting growth will lead to lower profitability of firms, since this option means a sharp one-time increase in sales.

The following hypotheses concern differences in profitability of young and mature firms with restarting growth. Current studies focus on differences in development dynamics of younger and older companies (Ewerth and Girotto, 2021). The second may possess specific capital (for instance, resources, knowledge and experience) that young companies may not have. The lack of the well-established brand may also increase companies' uncertainty in challenging times. andounger firms can experience even higher expenses. These factors can negatively affect the profitability of young firms if they grow rapidly (cases of FSTG and MSTG).

On the other hand, empirical studies (Vukovic *et al*., 2023; Vithessonthi and Tongurai, 2015) confirm higher profitability of young firms. This result is largely because young firms use modern, effective technologies for organizing business and

business processes, including digital technologies. This allows for significant cost savings. In line with the imprinting literature (Marquis and Tilcsik, 2013), firm's early choices, strategies, capabilities and performance are imprinted on the context at the time of the founding. As the internet has become a de facto norm fairly recently, younger firms are more likely to be "born digital", compared to their older counterparts, and they function in the digital environment effortlessly. Apart from providing obvious economic benefits, this further contributes to their perceived legitimacy, thus reducing the challenges, otherwise associated with the young age. Older firms, in contrast, may not have the inborn competence of functioning smoothly in the digital space. They find it hard, spend more, and emerge as a losing party from the digital competition (Fonseca *et al*., 2021).

Accordingly, the paper tests the following hypotheses:

Hypothesis 2.1. Long-term restarting growth will lead to increased profitability of young firms.

Hypothesis 2.2. Short-term restarting growth will lead to increased profitability of young firms.

Materials and methods

Data and variable

The initial database included more than 10,000 Russian industrial enterprises with financial indicators for 2012-2021, which was created based on SPARK data (SPARK, 2023). The Russian classification of types of economic activity generally corresponds to the Eurostat classifier NACE Rev. 2 (European Commission, 2008). The sample is represented by industrial enterprises that are reflected in sections B and C (divisions 05-33) of the European classification system. To account for sectoral differences in profitability dynamics, regression models include a corresponding variable, which is described below. Based on this database, we formed a working sample of 1,882 firms with a long period of falling sales (firms with sales, falling annually for three years in 2013-2017), which showed sales growth in 2016. The paper tested a wide range of factors and assessed their impact on the profitability of these firms for the period of 2016-2019. This panel data includes 7528 observations (1882 firms and 4 years).

The dependent variable is the firm's return on equity (ROE). This variable is calculated as the ratio of net profit to the firm's equity capital. This indicator is critical for investors as it shows the return on equity and affects the size of dividends. Such dependent variable is used in (Le and Phan, 2017).

The independent (tested) variables are dummy variables, reflecting the four groups of firms with restarting growth, which were described above (FLTG, MLTG, FSTG, MSTG). If the company belongs to this group, the variable takes the value of 1. Otherwise, it is equal to 0.

The control variables are as follows:

- Size of the enterprises (Size), defined as the natural logarithm of revenue, adjusted for the inflation index (Munjal *et al*., 2019).
- Share of fixed assets in total assets (FATA) (Anokhin *et al*., 2021).
- Leverage (Leverage), defined as debt capital, divided by total assets, multiplied by 100%, (Vithessonthi and Tongurai, 2015).
- Asset Turnover (Asset Turnover), measured as sales divided by total assets, multiplied by 100% (Liang *et al*., 2020).
- Firm's age (Age) (Vithessonthi and Tongurai, 2015).
- Average profitability by sectors and years (Sectoral average), which we use to account for differences in firm performance across business sectors and years (Vukovic *et al*., 2023).
- Sales growth (Growth), which is calculated as the difference in sales between years t and (t – 1), divided by sales in year (t – 1), multiplied by 100% (Le and Phan, 2017; Federico and Capelleras 2015).

Statistical characteristics of control and tested variables are presented in Table 2.

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Table 2
Statistical characteristics of control and tested variables

N	Variables	Mean	Standard deviation	Correlation coefficients				
				1.	2.	3.	4.	5.
1	Size	19,61	1,50	1,00				
2	FATA	24,61	19,68	0,16	1,00			
3	Leverage	36,99	21,31	0,10**	-0,02	1,00		
4	Asset Turnover	166,86	108,50	-0,09**	-0,12**	0,14	1,00	
5	Age	19,75	6,36	0,08	0,14	-0,10***	-0,11***	1,00
6	Sectoral average	13,72	40,31	0,02*	-0,10***	-0,01	0,12**	-0,08**
7	Growth	7,59	32,94	0,06	-0,05***	0,09	0,09	-0,10***
8	FLTG	0,03	0,18	0,00	-0,05***	0,03	0,00	-0,07**
9	MLTG	0,08	0,28	-0,02	-0,05***	0,07	0,01	-0,07**
10	FSTG	0,11	0,31	0,03*	-0,03*	0,03	0,01	-0,10***
11	MSTG	0,14	0,34	0,03	0,03	0,05**	0,00	-0,04**

N	Variables	Correlation coefficients					
		6.	7.	8.	9.	10	11.
1.	Size						
2.	FATA						
3.	Leverage						
4.	Asset Turnover						
5.	Age						
6.	Sectoral average	1.					
7.	Growth	-0,04**	1.				
8.	FLTG	0,06	0,19	1.			
9.	MLTG	0,07	0,14	-0,06**	1.		
10	FSTG	0,01	0,22	-0,07**	-0,1***	1.	
11.	MSTG	0	0,05**	-0,07**	-0,12**	-0,14**	1.

*** p < .001; ** p < .01; * p < .05.

Note. Calculated by the authors.

According to our calculations, we do not observe a strong correlation between the predictor variables, since r <0.70. In this case, all the considered variables can be used in regression models.

Models

Model 1 includes only control variables, as well as the square of the variable Growth. Models 2.1-2.4 alternately test dummy variables that reflect different types of restarting growth of firms and allow us to test hypotheses 1.1 and 1.2. Models 3.1-3.4 add the interactions of dummy variables with the variable Age of the firm (moderation effects) to models 2.1-2.4 and allow us to test hypotheses 2.1, 2.2.

Since we are analyzing panel data, the least squares model is inadequate for this task. The Hausman test was applied to select the regression model for our panel data. It favors a fixed-effects regression model, which is used in further calculations.

The general formula for a regression model with fixed effects is as follows (Baltagi, 2021):

$$Y_{it} = \text{Intercept} + X_{it}*\beta + \lambda_t + \varepsilon_{it} \quad (1)$$

where

Intercept – constant;

X_{it} – variables and β – coefficients for variables;

λ_t – time effect;

ε_{it} – model regression residual.

Applying this general formula to our Model 1, we obtain:

$$ROE = \text{Intercept} + \beta_1*\text{Size} + \beta_2*\text{FATA} + \beta_3*\text{Leverage} + \beta_4*\text{Asset Turnover} + \beta_5*\text{edad} + \beta_6*\text{Sectoral average} + \beta_7*\text{Growth} + \beta_8*\text{Growth}^2 + \lambda_t + \varepsilon_{it} \quad (2)$$

Based on a similar technique, let us construct formulas for Models 2.1-2.4 and 3.1-3.4.

To minimize the problems of multicollinearity, all controls variables in regression models were standardized according to Marquardt (1980). The independent dummy variables (FLTG, MLTG, FSTG, MSTG) were not standardized and took values of 0 or 1 to simplify the interpretation of the results.

Results and discussion

Regression modeling

The results of regression modeling are presented in Tables 3 and 4. In all the models, the dependent variable is ROE; standard errors are shown in parentheses.

Table 3
Regression results

Variables	Model 1	Model 2.1 (FLTG)	Model 2.2 (MLTG)	Model 2.3 (FSTG)	Model 2.4 (MSTG)
Intercept	12.31*** (0.57)	12.09*** (0.57)	11.92*** (0.57)	12.37*** (0.57)	12.28*** (0.58)
Size	(0.57)	12.09***	2,17*** (0,28)	2,12 (0,29)	2,12 (0,29)
FATA	(0.57)	11.92***	-2,68** (0,29)	-2,74 (0,29)	-2,74 (0,29)
Leverage	(0.57)	12.37***	-1,35** (0,28)	-1,27** (0,28)	-1,27** (0,28)
Asset Turnover	(0.57)	12.28***	4,82 (0,28)	4,77 (0,28)	4,77 (0,28)
Age	(0.58)	-2,67 (0,29)	-2,68** (0,29)	-2,77** (0,29)	-2,75** (0,29)
Sectoral average	4,38** (0,29)	4,29 (0,29)	4,37 (0,29)	4,4*** (0,29)	4,38** (0,29)
Growth	8,58** (0,40)	8,06** (0,4)	8,23** (0,40)	8,62** (0,4)	8,57 (0,4)
Growth2	-0,66** (0,08)	-0,62** (0,08)	-0,62** (0,08)	-0,66** (0,08)	-0,66** (0,08)
Dummy (FLTG)		10,57 (1,55)			
Dummy (MLTG)			5,49 (1,02)		
Dummy (FSTG)				-0,73 (0,93)	
Dummy (MSTG)					0,22 (0,81)

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Variables	Model 1	Model 2.1 (FLTG)	Model 2.2 (MLTG)	Model 2.3 (FSTG)	Model 2.4 (MSTG)
Adj. R2	0,185	0,191	0,189	0,185	0,185
p	<0,001	<0,001	<0,001	<0,001	<0,001
*** p < .001; ** p < .01; * p < .05.					

Note. Calculated by the authors according to SPARK data.

According to the obtained regression coefficients, we construct the following formula for Model 1:

$$ROE = 12.31 + 2.12 * Size - 2.74 * FATA - 1.27 * Leverage + 4.77 * Asset\ Turnover - 2.75 * Age + 4.38 * Mean_{ind} + 8.48 * Growth - 0.66 * Growth^2 + \lambda_t + \varepsilon_{it} \quad (3)$$

Las fórmulas para los modelos 2.1-2.4, 3.1-3.4 se elaboran de manera similar de acuerdo con los datos de las tablas 3 y 4.

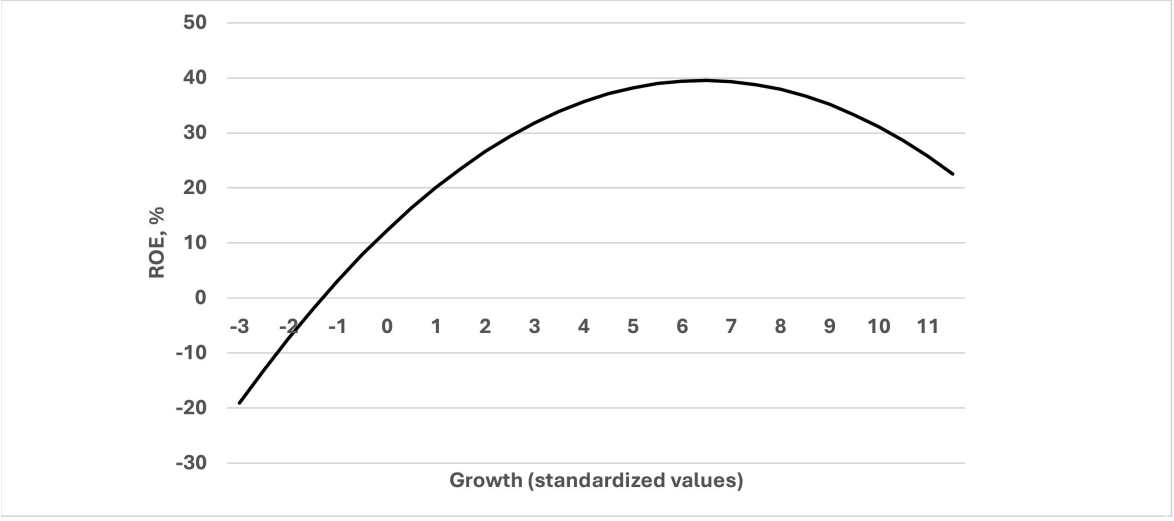
Formulae for Models 2.1-2.4, 3.1-3.4 are constructed similarly according to the data in Table 3 and Table 4.

Model 1 is significant and explains about 18% of the variation in the dependent variable. All control variables in Model 1 are highly significant, with Size, Turnover and Sectoral average, having a positive effect on ROE, and with Leverage, Age and FATA, having a negative effect. Model 1 shows the nonlinear (inverted u-shape) impact of sales growth on a firm's return on equity. The graphic visualization of this influence is presented in Fig. 1. When plotting the graph, we take into account the fact that all the variables in model 1 are standardized. We assume that all control variables take average values, but these values are zero because they are standardized, and we can exclude them from the calculations. In this case, the formula for model 1 will be as follows:

$$ROE = 12.31 + 8.48 * Growth - 0.66 * Growth^2 \quad (4)$$

Figure 1

Nonlinear impact of sales growth on ROE



Note. Calculated by the authors.

Figure 1 shows that high sales growth rates, first, slow down ROE growth and then lead to a decrease in ROE.

Models 2.1-2.4 add dummy variables, reflecting different types of restarting growth of firms. These models give different results. A signifi-

cant positive impact of long-term sales growth on ROE was revealed in models 2.1 and 2.2 for the cases of FLTG and MLTG. The coefficients for these variables in the regression model are 10.57 and 5.49, which means an additional increase in profitability for firms with these types of growth by 10.57% and 5.49%, respectively (since these variables take values of 0 and 1). Such increase in profitability will be observed annually during 4 years of the study period, which is extremely attractive for investors. In contrast, short-term sales growth does not have a significant effect on ROE. The coefficients for the variables FSTG and MSTG are not significant and are close to zero. Models 2.1-2.4 are highly significant and the share of the explained variation in the dependent variable increases to 19%.

Consequently, Models 2.1-2.4 confirmed hypothesis 1.1 about the positive impact of long-term growth on ROE, since the coefficients in models are significant and positive and do not confirm hypothesis 1.2; they did not reveal a significant effect of short-term growth on ROE.

Table 4 presents the results of the joint influence of dummy variables and the variable age on ROE. In all the models, the dependent variable is ROE; standard errors are shown in parentheses.

Table 4

Regression results with moderator age

Variables	Model 3.1 (FLTG)	Model 3.2 (MLTG)	Model 3.3 (FSTG)	Model 3.4 (MSTG)
Intercept	12,08*** (0,57)	11,92** (0,57)	12.36*** (0,57)	12.30** (0,58)
Size	2.17*** (0,28)	2.16*** (0,28)	2.12 (0,29)	2.1*** (0,29)
FATA	-2,69 (0,29)	-2,69 (0,29)	-2,74 (0,29)	-2,73** (0,29)
Leverage	-1,28** (0,28)	-1,35** (0,28)	-1,27** (0,28)	-1,28** (0,28)
Asset Turnover	4,83** (0,28)	4,81 (0,28)	4,77 (0,28)	4,77 (0,28)
Age	-2,51** (0,29)	-2,56 (0,3)	-2,74 (0,31)	-3,04** (0,31)
Sectoral average	4,33** (0,29)	4,36 (0,29)	4,4*** (0,29)	4,39 (0,29)
Growth	8,05** (0,4)	8,23** (0,40)	8,63** (0,40)	8,55** (0,40)
Growth^2	-0,63*** (0,08)	-0,62** (0,08)	-0,67** (0,08)	-0,67** (0,08)
Dummy (FLTG)	8,99** (1,64)			
Dummy (MLTG)		5,23** (1,03)		
Dummy (FSTG)			-0,81 (0,96)	
Dummy (MSTG)				0,40 (0,82)
Age * Dummy	-4,70** (1,58)	-1,29 (0,96)	-0,31 (0,91)	2,36 (0,84)
Adj. R^2	0,191	0,188	0,185	0,185
P	<0,001	<0,001	<0,001	<0,001

*** p < .001; ** p < .01; * p < .05.

Note. Calculated by the authors according to SPARK data.

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Models 3.1-3.4 are significant; R2 remains at the level of 18-19%. The coefficients and significance of the control variables and the dummy variable remain virtually unchanged. The new variable (Age * Dummy) is highly significant in two cases:

- In the case of FLTG, it negatively affects profitability.
- In the case of MSTG, it has a positive effect on profitability.

To correctly interpret the results obtained, these dependencies are visualized (Fig. 2 and 3).

When plotting the graph, we take into account the fact that all variables in model 1 are standardized, except for the dependent and dummy variables. We assume that all control variables take average values, but these values are zero because they are standardized, and we can exclude them from the calculations. In this case, the formula for model 3.1 (FLTG) will be as follows:

$$ROE = 12.08\text{-}2.51 * Age + 8.99 * Dummy\ (FLTG) - 4.70 * Age * Dummy\ (FLTG) \quad (5)$$

Since the dummy variable takes the value of 0 or 1, we obtain two functions:

$$ROE = 12{,}08 - 2{,}51 * Age + 8{,}99 - 4{,}70 * Age \quad (6)$$

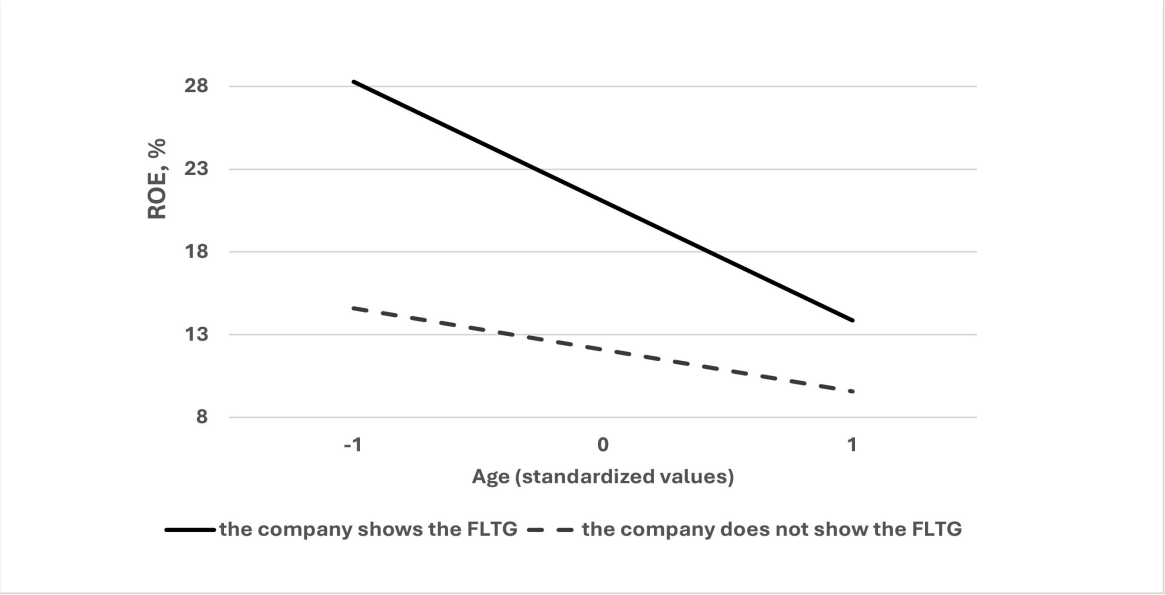
$$ROE = 12{,}08 - 2{,}51 * Age \quad (7)$$

Formula 6 is for companies that have shown FLTG. The next one is for companies that did not show FLTG.

To visualize Model 3.4 (MSTG), functions are constructed in a similar manner.

Figure 2 shows the advantages of young firms. andoung firms with FLTG receive the greatest gains in ROE, compared to those without FLTG. As age increases, the advantage of firms with FLTG by ROE decreases. In the MSTG case (Figure 3), the opposite picture is observed. andoung companies without MSTG receive the greatest gains in ROE, compared to young firms with MSTG. As age increases, the advantage of firms without MSTG by ROE decreases.

Figure 2
Joint influence of FLTG and firm age on ROE



Note. Calculated by the authors.

Figure 3
Joint influence of MSTG and firm age on ROE

Note. Calculated by the authors.

Consequently, hypotheses 2.1 and 2.2 are partially confirmed for cases FLTG and MSTG.

Robustness test

To check the robustness of results, the authors build additional regression models for Models 3.1-3.4 with robust correction that takes into account possible heteroscedasticity and serial (cross–sectional) correlation in the data ("arellano" method, "HC3" type), according to (Arellano, 1987). The results of the robustness test for Models 3.1-3.4 are presented in Table 5. In all the models, the dependent variable is ROE; standard errors are shown in parentheses.

Table 5
Robustness tests results

Variables	Model 3.1 (FLTG)	Model 3.2 (MLTG)	Model 3.3 (FSTG)	Model 3.4 (MSTG)
Variables	12,08*** (0,57)	11,92** (0,57)	12,36*** (0,57)	12,30** (0,58)
Intercept	2,17*** (0,31)	2,16*** (0,33)	2,12 (0,35)	2,1*** (0,34)
Size	-2,69 (0,05)	-2,69 (0,05)	-2,74 (0,07)	-2,73** (0,06)
FATA	-1,28* (0,53)	-1,35* (0,55)	-1,27* (0,53)	-1,28** (0,53)
Leverage	4,83** (0,37)	4,81 (0,37)	4,77 (0,37)	4,77 (0,37)
Asset Turnover	-2,51** (0,27)	-2,56 (0,34)	-2,74 (0,26)	-3,04** (0,27)

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Variables	Model 3.1 (FLTG)	Model 3.2 (MLTG)	Model 3.3 (FSTG)	Model 3.4 (MSTG)
Age	4,33** (0,12)	4,36 (0,14)	4,40** (0,14)	4,39 (0,14)
Sectoral average	8,05** (0,31)	8,23** (0,45)	8,63** (0,52)	8,55** (0,51)
Growth	-0,63*** (0,07)	-0,62** (0,06)	-0,67** (0,07)	-0,67** (0,07)
Growth2	8,99* (4,51)			
Dummy (FLTG)		5,23** (1,68)		
Dummy (MLTG)			-0,81 (0,61)	
Dummy (FSTG)				0,40 (0,27)
Dummy (MSTG)	-4,70* (2,02)	-1,29 (0,94)	-0,31 (0,69)	2,36 (0,41)
Age * Dummy	0,191	0,188	0,185	0,185
Adj. R^2	<0,001	<0,001	<0,001	<0,001
p				

Note. Calculated by the authors according to SPARK data.

Our calculations confirm the stability of the obtained results. Tested variables (Dummy and Age* Dummy) remain significant in robust models:

- Dummy remains significant in models 3.1 and 3.2.
- Age*Dummy remains significant in models 3.1 and 3.2.

The study performed additional estimates of the standard errors and significance of the coefficients, considering possible heteroscedasticity and serial (cross–sectional) correlation in the data. These calculations (robustness check) confirmed the results and conclusions, described in the Results section.

Theoretical contribution

The impact of growth on firm performance has been deeply studied in the world literature. Scientists have described the theoretical background and reasons that determine the positive (Federico and Capelleras, 2015) or negative impact of growth on profitability (Jang and Park, 2011). However, the impact of different types of restarting growth on a firm's return on equity is not in the focus. We attempted to solve this problem and show that different types of restarting growth might have different effects on firms' profitability. It shows that long-term fast or moderate growth leads to an increase in profitability (5-10% increase in ROE), in contrast to short-term types of growth that do not affect ROE. We believe that long-term annual sales and growth rates are not too high, which means that such growth will have a positive impact on profitability. In contrast, short-term growth often means an increase in sales of 30%, 60%, or more percent per year. With such high growth, its negative impact on profitability begins to appear, and no increase in ROE is observed. We also note that, in this case, we are talking about growth rather than about a rebound after a fall. We have demonstrated this using a comparable sample of firms (Spitsin *et al.*, 2024). This work shows that firms with restarting growth not only compensated for the decline in sales during the troubled period, but also exceeded it during the growth period, i.e. achieved higher sales than those before the start of the troubled period.

Further research showed that additional benefits and greater ROE gains accrued to young firms with fast long-term growth. We believe that this result is consistent with the fact that young firms use modern, effective technologies for organizing business and business processes, including digital technologies, as shown in (Marquis and Tilcsik, 2013; Fonseca *et al*., 2021). Indeed, this feature of young firms may make them more flexible and capable of rapid sales growth without a significant increase in costs.

We can recommend the following direction for further research. This paper documents the differential impact of different types of growth on ROE when firms restart growth after a long period of declining sales. However, we can expect similar differences for traditional cases of fast-growing companies (gazelle firms, scale-up firms, etc.). This assumption is consistent with the paper (Spitsin *et al*., 2022), which proves the advantage of long-term growth over short-term growth for fast-growing companies in high-tech industries using analysis of variance. It is advisable to further test this assumption for different countries and industries, using regression modeling.

Practical implementation

The obtained results can be of interest to investors, owners and managers of firms. They show that annual long-term growth allows firms to achieve higher performance (ROE), and firms should strive for it. Firm owners and managers benefit from this type of growth, and investors should look for firms that can exhibit this type of growth.

However, investors, owners and managers of firms need to take into account the following point: the predominance of "Growth Episodes" over "Growth Firms". The empirical evidence on firm growth shows that the fluctuation within firms exceeds that between firms (Coad and Srhoj, 2019). This finding corresponds to "Growth Episodes" rather than designating entities such as "Growth Firms" (Grover Goswami *et al*., 2018). In this study, there were significantly more firms with short-term rapid or moderate growth than those with similar types of long-term growth. Finding firms with long-term fast or moderate annual sales growth (for investors) or providing firms with this type of growth (for owners and managers) is a challenging task. Some factors that increase the likelihood of long-term growth of a company (for the case of restarting growth) were identified in the work (Spitsin *et al*., 2024). However, further scientific research in this area is required.

Conclusions

This paper examined the profitability characteristics of firms with restarting growth and reconciled the tensions between growth and firm profitability.

In the world literature, many works are devoted to the analysis of fast-growing companies. Scholars analyze in detail the reasons for rapid growth and try to predict companies that can move to growth, but there is practically no assessment of financial results (profitability) for fast-growing companies.

We addressed this gap in economic research and modeled the impact of different types of growth on profitability in a sample of firms with restarting growth. We introduced four types of restarting growth: moderate (MLTG) and fast (FLTG) long-term growth, moderate (MSTG) and fast (FSTG) short-term growth. The study revealed a positive impact of long-term growth on ROE, but it did not confirm the impact of short-term growth on ROE.

Scholars have noted certain contradictions between the goals of growth and profitability and often consider them as alternative goals for business development. Empirical studies provide varying results on the impact of growth on firm profitability. Our approach reconciles these contradictions and shows that sustainable long-term growth (growth over several consecutive years) allows firms to achieve higher profitability.

This research showed that additional benefits and greater ROE gains accrued to young firms with fast long-term growth. This can be explained by the fact that the low base effect is realized in this case, or there are no accumulated significant contradictions in development as in long-established firms.

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Our approach to studying the impact of different types of growth on a company's profitability was implemented for a sample of companies with restarting growth. It seems appropriate to use it to study other types of fast-growing companies (gazelle firms and scale-up firms), as well as in other cases of modeling the impact of growth on the profitability of the company. We believe that introducing different types of firm growth into models will help reconcile the tensions between growth and profitability and identify the types of growth that maximize firm profitability.

Limitations of the study. This work was carried out based on a sample of industrial enterprises in one country, which found itself in difficult economic conditions. It is necessary to verify the obtained results using the example of other countries with developed and developing economies over different time periods.

Suggestions for further research have been briefly described above. Firstly, we plan to continue research into the restarting growth of companies after a long-term decline in sales in order to identify new (additional) factors that increase the likelihood of long-term growth of a company. Secondly, we consider it promising to study the impact of different types of growth on profitability for traditional cases of fast-growing companies (gazelle firms, scale-up firms, etc.).

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