THE UNIVERSITY OF LATVIA

FACULTY OF BUSINESS, MANAGEMENT AND ECONOMICS

Department of Global Economics and Interdisciplinary Studies

DETERMINANTS OF ECONOMIC GROWTH OF SMES IN GERMANY AND LATVIA WITH FOCUS ON MANUFACTURING SMES

BACHELOR'S THESIS

International Economics and Commercial Diplomacy

Author: **Kamila Ismagilova**

Student ID Number: ki17009

Academic supervisor: Mag.Admin.Lecturer Annija Apsīte

RIGA 2021

ANNOTATION

The following thesis is dedicated to the analysis of Small and Medium-Sized Enterprises and the factors of their growth. It elaborates on diverse contributors to the development of SMEs, challenges and prospects they encounter in today's globalized and digitalized economy. It also provides an extensive explanation of SMEs integral role in the inclusive growth of economic and social dimensions. The thesis also includes various strategies and government programs that have a beneficial effect on the productivity and development of enterprises. For a deeper understanding, the sectors of small and medium-sized enterprises in Latvia and Germany are considered with the identification of their shortcomings and advantages.

Keywords: *growth factors, business environment, size and age, challenges, financing, Gibrat's Law*

ANOTĀCIJA

Šis darbs ir veltīts mazo un vidējo uzņēmumu (MVU) un to izaugsmes faktoru analīzei. Tajā izklāstīti dažādi faktori, kas ietekmē MVU attīstību, kā arī izaicinājumi un perspektīvas, ar ko tie sastopas mūsdienu globalizētajā un digitalizētajā ekonomikā. Darbā plaši iztirzāta MVU būtiskā loma ekonomikas un sociālās dimensijas iekļaujošā izaugsmē. Šajā darbā arī iekļautas dažādas stratēģijas un valsts programmas, kam ir labvēlīgs iespaids uz uzņēmumu produktivitāti un attīstību. Padziļinātas izpratnes radīšanai kā piemērs ir izvēlēts mazo un vidējo uzņēmumu sektors Latvijā un Vācijā, identificējot abu sektoru trūkumus un priekšrocības.

***Atslēgas vārdi**: izaugsmes faktori, uzņēmējdarbības vide, lielums un vecums, izaicinājumi, finansējums, Gibratas likums*

Table of Contents

Introduction.

The accelerated growth of world markets during the last decades has led to the development of competition in developed as well as developing countries, thus creating the basis for the adoption of market-oriented policies by entrepreneurs. The well-known fact about the growth of the number of small and medium-sized enterprises proves that they contribute to the development of strategies to maintain and increase competition in the global economy[1]. Such enterprises, according to the OECD, account for 95 percent of all enterprises and create 60-70 percent of jobs in the economy, not to mention the fact that they generate a significant proportion of new job positions in OECD countries every day. In the European Union, small and medium-sized enterprises account for a predominant share of 99 percent of all enterprises. Moreover, 91 percent of these enterprises are micro-companies employing no more than 10 workers.[2]

The relevance of the research can be explained by the significant share of such enterprises, the growth and development of which is a significant factor for the progress of the economy, creation of work places, attracting foreign investment, innovations as well as recovery from the crisis economy.

The aim of the study, in view of the above, is to analyze the possible variables responsible for the growth and development of SMEs and propose the most influential determinants of SME growth. The research will try to tackle the following questions:

- Is the traditional assumption proposed by Gibrat's law that size and age of the company are not determining its success and pace of development true for manufacturing sector and sample countries of Germany and Latvia?
- What are other determinants, especially in today's digitalized environment?

Hypotheses of the research:

Hypothesis 1: In line with previous findings, it can be hypothesized that growth in manufacturing SMEs in Germany and Latvia is not related to the traditional firm characteristics of size and age.

[1] Majority of small and medium-sized enterprises (SMEs) are developing in a rather complex business world, driven by globalization and internationalization of markets, in which there is a strong demand for greater efficiency and productivity, as well as the use of innovative technologies. This environment creates unbearable pressure on enterprises, the need to compete not only in the domestic but also in the international market, generates great competition, as well as contributes to the rapid evolution of SMEs in terms of their management (Cagliano and Spina, 2002).

[2] OECD center for Entrepreneurship, SMEs and Local Development, 2009 "The Impact of the Global Crisis on SME and Entrepreneurship Financing and Policy Responses"

Hypothesis 2: Variety of other firm-specific characteristics with regards to SMEs in such as competition, capital structure, internal finance and production efficiency account for a major role in explaining the growth of SMEs in developed market.

The subject of the research is Small and Medium sized companies of various economic sectors (with focus on manufacturing companies) age and size, operating in the market of Germany and Latvia.

The object of the research are various environments, legislative and structural aspects within which the Small and Medium sized companies operate, and other factor that facilitate and undermine their growth such as competition, government support, investment and risks.

The methodology:

This research presents a quantitative analysis of secondary data using a descriptive method. The analysis of the data will be performed using the statistical method of regression analysis in order to test the relationship between variables and growth of the company. The quantitative technique used in this research is mainly data collection and document screening (sourcing numerical data from companies or tracking occurrences from financial statements).

In the first part, a theoretical analysis of the existing literature will be carried out, which will try to approach this issue from two sides - traditional, based on the size and age of the company, and based on the specifics of the company, such components as financing, competition, capital components, factor productivity, liquidity and empowerment.

The second part is structured in a saddle fashion, providing the methodology and basics for the conducting of the research, presents available information, overall picture in each country. In addition, it tackles certain environmental factors of SME growth that cannot be included in the numerical analysis.

Third part attempts to present variables in numerical form for the given sample in order to run a regression and determine the factors that have the biggest contribution to SME growth and explain the obtained results.

1. SMALL AND MEDIUM-SIZED ENTERPRISES AND THEIR IMPORTANCE FOR THE ECONOMY

1.1. Characteristics and Advantages of SME

Economies worldwide realize the importance of Small and Medium-Sized Enterprises with regards to the development of the state, increasing competitiveness and the well-being of nation. This type of firms with 200 employees or less are constituting the largest sector in most of the economies globally and hence, stimulate governments for making more efforts and initiatives in order to promote the development of SMEs and support them in different ways. The prevailing type of SMEs are micro firms, together with SMEs they construct on average 95 per cent of firms and create large proportion of employment.

- According to the World Trade Organization, in developed countries SMEs account for 90 per cent of all businesses, that generate on average 60 to 70 percent of jobs and 55 percent of Gross Domestic Product. Apart from being the major drivers of economic growth and employment, SMEs are also significant as priority innovation designers - for instance, in Europe, small and medium-sized enterprises register 20 per cent of patents in the biotechnology sphere[3]. In addition, SMEs also contribute to the reduction of poverty and social integration. States are highly relying on SMEs especially nowadays, when economies encounter different challenges, as such organizations are the substantial element of stable and inclusive economic development. Small and Medium-sized enterprises are often referred to as the backbone of global economic and social development and assist in tackling crucial problems and achieving important goals[4,5].
- Since SMEs are one of the main contributors to social inclusion and poverty elimination, they became a key factor for reaching UN Sustainable Development Goals, that promote inclusive and sustainable economic growth,

[3] Eurostat, 2014. Patent Statistics at Eurostat. Mapping the contribution of SMEs in EU patenting. Eurostat Manuals and Guidelines, Luxembourg, http://ec.europa.eu/eurostat/documents/3859598/6064260/KS-GQ14-009-EN-N.pdf/caa6f467-11f8- 43f9-ba76-eb3ccb6fab6d.
[4] Internal Market, Industry, Entrepreneurship and SMEs, European Commission, Web-page https://ec.europa.eu/growth/smes_en
[5] Druker,2009. Innovation and Entrepreneurship, New York: Harper Collins.

employment and decent work for all[6] and 'build resilient infrastructure, promote sustainable industrialization and foster innovation' (SDG- 9)[78].

- SMEs facilitate creation of predominant employment positions in all geographic regions of the country across various sectors. The job opportunities created by SMEs are highly inclusive, embracing even low-skilled workers, giving thus chances to increase their skills, access healthcare and social services[9]. The proportion of employment positions provided by SMEs differ from sector to sector, with such spheres as services providing more jobs and value added than other sectors[10]. Employees enjoy professional training for increasing qualification, such as vocational or technical. Moreover, many SMEs set up friendly atmosphere and pay careful attention to employee satisfaction at the workplace, come up with more innovative and entertaining working styles, making it more enjoyable to conduct the work and eliminating monotonous types of tasks and additional stress.
- SMEs develop a balance between social and economic spheres. Different social sectors are also benefiting from SMEs, as they represent a crucial institution for resolving societal needs and ensuring public goods and services. Social SMEs approach innovatively such problems as unemployment, poverty and social exclusion. Such companies gained progressive economic weight, recognition and growth especially in tackling the consequences of economic crisis. For instance, in European countries such as France social economy accounted for 10 per cent of GDP and in Belgium in post crisis period employment in social enterprises continues an increasing trend[11].

This sector is highly versatile in terms of company sizes, age, occupation, type of ownership, strategies, goals and business models, which makes it so difficult to address them by one single fitting all approach, the main common thing is that all SMEs are highly beneficial. Some researchers are currently arguing that SMEs are less vulnerable to external to their country business cycles than large companies[12]. The reason behind this is trade

[6] High Level Political Forum on Sustainable Development, 2019 "Review of SDG implementation and interrelations among goals Discussion on SDG 8 – Decent work and economic growth"
[7] Sustainable Development Goals 9, Industry, Innovation and Infrastructure.
[8] IFAC, 2018. Foundation for Economies Worldwide=Small Business. https://www.ifac.org/globalknowledge-gateway/finance-leadership-development/discussion/foundation-economies-worldwide.
[9] OECD (2017b), Increasing productivity in small traditional enterprises: programmes for upgrading management skills and practices, OECD Working Party on SMEs and Entrepreneurship, CFE/SME(2016)6.
[10] OECD (2017c), Entrepreneurship at a Glance 2017, OECD Publishing, Paris, forthcoming.
[11] Social Protection Committee 2016. 2015 Social Protection Performance Monitor (SPPM) dashboard results. SPC/ISG/2016/02/4 FIN
[12] Moscarini and Postel-Vinay, 2012. 'The Contribution of Large and Small Employers to Job Creation in Times of High and Low Unemployment.' American Economic Review, 102(6), p.2509-39.

integration and industry consolidation, that puts a large company in the position of defining business cycles. Meanwhile large part SMEs innovate, produce and sell their products in the same country, without relying on outsourcing.

- Worth to mention the fact that large proportion of SME choose environmentally friendly approach to their production, being the main contributors to clean-tech markets and expansion of Eco industry. In countries like the UK and Finland, SMEs occupy predominant proportion of clean technology positions[13,14]. SMEs, unlike big multinational corporations are more eager to provide greener supply chains, especially at native tech markets[15].
- Due to the competitive nature of SMEs, they efficiently cope with growing demand for new technologies. They scrupulously monitor market and new trends in order to understand the demands and wishes of the customers, becoming the origin of innovative ideas and discoveries. Small and Medium-sized enterprises possess more elasticity than large companies in manufacturing of the products, marketing activities and other services. Thus, elasticity facilitates the smoothness of external changes and allows to make internal ones timely, overcoming troubles and market instabilities easier. Additional factor to elasticity of SMEs is quick decision-making process, enabling them to have less managerial and general operating staff and manufacture faster and less expensive. Since many SMEs avoid outsourcing, they developed effective ways of expansion of manufacturing spots and industrialization throughout the whole country[16].
- SME sector represents a source of entrepreneur skills and innovation, they stimulate market competition with regards to prices, quality and efficiency. Large companies also benefit from SME input, as they might be intermediary suppliers of some raw materials, equipment and tools, as well as distribution and sales of the goods produced by large countries. US study indicated, that SMEs produce four times higher profit for every dollar invested compared to large companies[17].

[13] Carbon Trust, 2013. Low carbon entrepreneurs: The new engines of growth, https://www.carbontrust.com/resources/reports/technology/low-carbon-entrepreneurs/.
[14] ETLA, 2015. From Cleantech to Cleanweb. The Finnish Cleantech Space in Transition, ETLA Paper No 43, ETLA – The Research Institute of the Finnish Economy, https://www.etla.fi/wpcontent/uploads/ETLARaportit-Reports-43.pdf.
[15] IBRD, 2014. Building competitive green industries: the climate and technology opportunity for developing countries, International Bank for Reconstruction and Development/The World Bank, Washington D.C.
[16] Fodor, O. C. (2011). Strategic decision making in small and medium enterprises: The impact of cognition and motivation on decision making processes. ASCR.
[17] Neagu, 2016. The importance and role of small and medium-sized businesses. Theoretical and Applied Economics Volume XXIII (2016), No. 3(608), Autumn, p. 331-338.

Consequently, Small and Medium-sized companies are of a crucial significance in terms of providing growth for economy, business and marketing[18]. According to European Community, SMEs, having a necessary commercial and industrial structure, contribute to the development of economy influencing all sectors: manufacturing, commerce, services; they increase employment and welfare level[19].

1.1.1. Disadvantages of SMEs

Despite the overall positive outlook and strong economic benefit of these companies, some downsides are also generally inherent to SMEs. Many of such companies suffer a scarcity of general administration, expert staff in finance and departments of financial planning, limited capital and inadequate support from the banks and other financial establishments, deficient product development, coordination between manufacturing and sales departments and participation of lower levels of employees in the decision making process, higher risk of bankruptcy and loss of independence. All the disadvantages inherent to SMEs are mainly the internal challenges and issues of the company that affect their vitalit, their weaknesses in comparison to large corporations, that do not usually have negative spillovers on external economic environment.

Table 1.

Illustrative comparison of SMEs and Large Companies

	SMEs	Large companies
Marketing	Ability to respond quickly in order to stay on top of rapidly changing consumer demands.	Holistic distributive and service sites. Existing products are well-established in the market and hold high market power.
Management	Low bureaucratic level. Flexible management and entrepreneurs that pursue new opportunities and are not afraid to take risks.	Professional management team developing complex corporate organizational strategies
Internal Communications	Highly effective informal communication within the company, enabling quick	Internal communication system is difficult and time-consuming, leading to slow response to external

[18] Day, J. (2000); Commentary-The Value and Importance of The Small Firm to The World Economy, European Journal of Marketing, Vol.34, Issue:9/10, pp.1033-1037.
[19] EC [European Commission] (2003), The New SME Definition User Guide and Model Decleration, Enterprise and Industry Publication, [available at ec.europa.eu/enterprise/enterprise_policy/sme_definition/sme_user_guide.pdf].

	response and problem-solving, thus adjusting faster to external changes	changes, threats and opportunities.
Qualified Technical Employees	Constant deficiency of highly-qualified technical experts. Often struggle to organize a sufficient R&D efforts.	Can attract highly-qualified technical specialists and afford own R&D laboratories and other advanced technical establishments.
External Connections	Often unable to afford usage of external scientific or technological resources due to lack of time or finance.	Have adequate funds to purchase necessary technology and equipment, outsource scientific, informative and technological services.
Financing	Experience difficulties attracting new capital. Hard to attract risk capital for innovative projects.	Opportunities for loans on capital markets and balance risks with a wide range of projects. Possess adequate funds for new technologies.
Economies of Scale and Systematic Approach	In some case scale economies present an obstacle for small company entry. Incapacity to offer complex product ranges.	Capacity to reach scale economies in R&D, manufacturing and services. Can offer a wide line of complimentary products.
Growth	Lack external capital that enables accelerated growth	Have funds to expand production range. Gain additional funds through diversity and procurement.
Patents	May encounter troubles in terms of time and costs required for patent acquisition.	Many firms employ patent specialists and defend patents in case of violation.
Government Regulations	Small firms frequently cannot manage complicated government regulations, in terms of cost of compliance.	Capacity to outsource or employ legal specialists to comply with regulations, able to balance regulatory costs.

Source: Xhepa, 2006[20]

[20] XHEPA, S. (2006), Competitiveness And The SME Development In Albania, The Institute for Contemporary Studies (ISB), Tirana, [available at http://www.western-balkans.info/upload/docs/1___Albania_SMEnew.pdf].

As it can be deducted from the table presented above, most of the challenges that SMEs encounter, are directly or indirectly related to insufficiency of finance, whether it comes to acquisition of patents, conducting R&D efforts or complying to Government Regulations, the cost burden is generally more onerous for SMEs, compared to large companies.

1.1.2. SMEs and Their Input in Innovation Dynamics

SMEs provide goods, ideas, and services that large companies cannot or not willing to provide. This is a particular advantage in comparison to large companies, who have long period production plans due to the big investments in equipment and the workforce, while SMEs have considerably smaller economies of scale and more elastic structure[21].

SMEs input in the development of innovation dynamics has grown notable in the last decades – the growth of income rates, technological progress and enlargement of niche markets are the main source of SMEs strengthening their comparative advantage. In addition, the resource constrains decrease as the income rate growth, and SMEs are able to adapt to the economies of scale. However, SMEs are able to quickly adapt the innovation generated by other companies and utilize it in other direction, by making incremental changes, thus contributing to value creation and providing for customer demands. Additionally, they might apply innovations in those locations that are not reached by larger companies[22].

With the development of non-technical innovation Small and Medium-sized companies are able to impact the innovation through the knowledge-based economy. Namely, SMEs exploit knowledge spillovers from other sources, establish partnerships with other companies, including large firms. Cross-border innovation or usage of ideas, technologies from abroad and their application at home-base is also popular both on input (finance and skills) and output levels (products and licenses). The main objective for such type of innovation is to determine the better partners, have appropriate management for implementation of the gained knowledge to achieve innovation[23].

[21] Keskin, H. et al, 2010 "The Importance of SMEs in Developing Economies" 2nd International Symposium on Sustainable Development, June 8-9 2010, Sarajevo

[22] OECD (2017) Enhancing the Contributions of SMEs in a Global and Digitalised Economy, Paris

[23] OECD (2013b), Skills Development and Training in SMEs, OECD Publishing, Paris

1.1.3. Arguments for Facilitation of SME Growth

The strategies of SME growth were included into the growth and development plans in the late 1940, when targeted policies such as subsidized credits, specified tax policies, grants and specialized agencies oriented on SME support were introduced. SMEs are important for all the states around the world, but particularly for the developing countries (Berry, 2007)[24]. Such importance is attributable to two reasons, first – a widespread notion of SMEs being an effective took for poverty reduction, and second is the fact that SMEs foster innovations and thus, a sustainable growth. According to the international historical evidence, SMEs support sustainable growth and sustainable growth is highly linked to poverty elimination[25].

Subsequently, SMEs are essential for a stable economic development and steady economic development. To achieve such, SME sector should be supported, especially in financial and consulting terms, to overcome initial difficulties at initial stages of development[26]. Moreover, apart from contribution to income generation and employment, they also contribute to export revenues in developing economies. However, to reveal the full potential of SMEs of economic development and poverty elimination, governments and SMEs should resolve some challenges.

To expand SME sector in developing country, it should encourage the creation of new companies and facilitate innovation. Secondly, SME should increase their productivity and competitiveness within their home country. Thirdly, the level of SME competitiveness should evolve into their integration into the global value chains through their exports, trade, investment and internationalization.

Even in favorable economic environment, SMEs require specific policies to maintain steady growth. During 2008 financial crisis, SMEs were hit the most, due to less diversified business activities, inability to downsize, weaker financial system, smaller financial opportunities, absence or low credit rating, and possible dependence on loans and credit, leaving to room for other financial operations.

[24] BERRY, A. (2007); The Importance of SMEs in the Economy, ITD Global Conference on Taxation of Small and Medium Enterprises, Buenos Aires, Argentina, 17-19 October 2007
[25] WARNER, A. (2001); Small and Medium Sized Enterprises and Economic Creativity, in Improving The Competitiveness Of SMEs In Developing Countries: The Role Of Finance To Enhance Enterprise Development, UNCTAD, NewYork & Geneva.
[26] GÜTTLER, C. (2001); Improving Competitiveness of SMEs in Developing Countries, in Improving The Competitiveness Of SMEs In Developing Countries: The Role Of Finance To Enhance Enterprise Development, UNCTAD, NewYork & Geneva.

Many OECD countries encounter the problem of slowed down growth, insufficient trade and investment and increasing social inequality[27]. Countries are also experiencing growing dissatisfaction of nation as a result of the changes that globalization has caused. In such conditions, governments are experiencing an urgent need to create favorable conditions for enterprises, that will utilize the advantages of the open market and technological advances that can be distributed across the population and the economy itself.

Facilitation of SME sector's adaptation and prosperity, their integration with technological progress and digitalization is a key for achieving inclusive economic growth, sustainable industrialization and reaping the full benefits of globalization. In order to boost the performance of SMEs, state needs to create favorable conditions and fair competition. The internal business environment also has considerable impact on SME sector – various barriers, inefficiencies and the policy regulations can burden or even terminate Small and Medium-sized enterprises. The degree to which SME sector contributes to the development of the economy is dependent on their ability to access and dispose vital strategic resources – financial (including investments), technological, manpower, which in turn, are connected to the country's education and training system, infrastructure and research for innovation.

These challenges are currently in the main focus in polity discussions, especially in the light of the consequences of 2008 financial crisis that many SMEs are still coping with. As a result of the disproportionate impact that SMEs faced, the imbalance between the productivity growth of Large companies and SMEs is widening, which contributes considerably to social and economic inequality[5,28,29].

Generating SME policies is a challenging task and difficult process, in which state should embrace both broad and specifically targeted conditions for this sector, that require engagement of various ministries, state agencies and all levels of government. SMEs are highly integrated in the regional environment, that serves as a source of skills and knowledge, connections, financing, industry and business opportunities, meaning that it is necessary to consider the impact that national policies may bring at the local level, taking into account regional conditions, needs and issues[30]. In addition to the national and local level, policies should also focus on changes in abroad market trends, SME regulations and technological

[27] OECD (2016a), The Productivity-Inclusiveness Nexus, Meeting of the OECD Council at Ministerial Level, Paris, 1-2 June 2016 [C/MIN(2016)3].
[28] OECD (2017a), Small, Medium, Strong. Trends in SME Performance and Business Conditions, OECD Publishing, Paris.
[29] OECD (2017b), Increasing productivity in small traditional enterprises: programmes for upgrading management skills and practices, OECD Working Party on SMEs and Entrepreneurship, CFE/SME(2016)6.
[30] OECD (2016e), Job creation and local economic development, OECD Publishing, Paris.

progress that may also affect the performance and opportunities of SME in their home country.

There are many ways of achieving SME engagement on bigger levels, such as possibility of international trade and investment, quality of institutions and facilitating legislation. SME are more burdened by tariffs and cost of entering international market, than large firms, as they operate smaller resources and less managerial staff to cope with it. In order to comply with standards, regulations, assessments SMEs have to pay same large amount of money as big companies, due to the fact that those costs are fixed and not waved with firm size or its revenue. Efficient and clear custom regulations can facilitate expansion of SMEs and their ability to cope with administrative and financial requirements[31,32]. One of the useful institution for SME sector can be National Trade Facilitation Committees. Additionally, obstacles in import area can hinder the chance of SMEs benefiting from other sources. In this way, in Southeast Asia, where Global Value Chain was adopted, SMEs have smaller proportion of value added from other countries than their larger counterparts[33].

Efficient insolvency regulations could facilitate business dynamics, giving a chance for the viable companies and granting them access to external finance. Severe bankruptcy regulations have left many owners with full personal liabilities to cope for many years after the liquidation of the company, destroy the reputation and motivation of entrepreneurs to start new business again. On top of that, poor insolvency regulation increases the risk for enders, and limit the supply of finance in the SME sector[34].

In order to enable healthy competitiveness for SMEs, state needs to provide high degree of transparency for the public sector, efficient administration and good quality of public services. The costs of many administrative procedures may overburden SMEs. Non-transparent public sector and corruption are destructive for SMEs as they may not be able to lobby their needs, manage public sector requirements and decrease entrepreneurial spirit.

[31] OECD (2015a), Policy Framework for Investment 2015 Edition, OECD Publishing, Paris.
[32] USITC (2014), Trade Barriers That U.S. Small and Medium-sized Enterprises Perceive as Affecting Exports to the European Union, United States International Trade Commission, Investigation No. 332-541, March 2014, https://www.usitc.gov/publications/332/pub4455.pdf.
[33] OECD (2017d), "Mapping SME Participation in Global Value chains in ASEAN", OECD Working Party of the Trade Committee, TAD/TC/WP(2015)25/REV2/PART2.
[34] OECD (2016a), The Productivity-Inclusiveness Nexus, Meeting of the OECD Council at Ministerial Level, Paris, 1-2 June 2016 [C/MIN(2016)3].

1.2. Determining the Environmental and Structural Company Factors Decisively Affecting SME Development

There are many various theories trying to discover the main factors driving the development of enterprises. These theories can be divided into two camps: the first links the development of companies with regards to the influence of their size and age, the second, in turn, links it with the influence of such variables as organization and strategy, as well as the main aspects of the characteristics of the managers and owners of these companies. There are many studies attempting to correlate the development of a company with its age and size[35]. In 1931, based on research indicating a lognormal distribution between the size and development of French manufacturing enterprises, Robert Gibrat defined a rule, now referred to as Gibrat's Law, which stipulates that the development of a company is a purely random effect and therefore does not depend on its size. Although Gibrat has convinced many readers with this mathematical model, many more recent studies refute this hypothesis, instead of which a new one is put forward, which states that small companies grow faster than large ones[36].

For example, Evans (1987)[37] examined manufacturing enterprises in the United States in a search for the same relationship between company size and growth, and found that firm growth slows declines as the size and age of the company increases. At the same time, according to the empirical literature, the indicators of company development are not limited only by its size and age, but also include various company-specific characteristics. Thus, Heshmati[38] (2001), using statistical information on micro and small companies in Sweden, found that one of the factors positively influencing the level of sales is the level of company indebtedness. In addition to this, according to studies based on Italian manufacturing companies, external financing plays a significant role in the development of the company, in addition to classic indicators like age and size[39].

[35] Regardless of the size and age of a company, capital has always been the fuel for its development. According to the theory of Myers and Majluf (1984), enterprises tend to raise capital in a hierarchical manner. As a rule, young small companies raise capital from internal, personal resources, as well as informal investments. As companies grow and the need for capital increases, they try to attract external investment in the form of government, bank loans and stock markets (Timmons, 1994).

[36] Hall 1987; Evans 1987a, 1987b; Dunne et al. 1989; Dunne and Hughes 1994; Audretsch et al. 1999 and Calvo 2006

[37] Evans, D. S., 1987. "The relationship between firm growth, size and age: estimates for 100 manufacturing industries". The Journal of Industrial Economics, 35 (4), 567-581

[38] Heshmati, A. 2001. "On the growth of micro and small firms: evidence from Sweden". Small Business Economics, 17 (3), 213-228.

[39] Morone, P. and Testa, G., 2008. "Firms' growth, size and innovation – an investigation into the Italian manufacturing sector". Economics of Innovation and New Technology, 17 (4), 311-329.

In a more recent study embracing a sample of 2,600 small and medium-sized enterprises in the Italian market, Morone and Testa (2008)[40] determined that not only young firms, on average, are subject to positive development, but also size, organizational innovation, and production and product innovation play a positive role in the development of the company's turnover. The same study suggested that, for the Italian SME market, marketing innovation does not represent an equally influential position in terms of company growth.

There is a variety of studies attempting to distinguish the aspects that enhance the development of large companies, but nevertheless, not much is known in this regard regarding SMEs. However, discoveries in the development indicators of large companies are not applicable to SMEs, because they are radically different in such parameters as structure and atmosphere, flexibility and ability to enter various markets, as well as strategy, application of innovation, speed and bureaucracy in decision-making and direction changes, as well as other aspects related to business organization[41].

1.2.1. Gibrat's Law and When it Holds

Gibrat's Law (1931) states that the development of a firm is completely random and does not depend on the size of the company. Many researchers have tried to study the validity of this law, but a more important aspect that did not receive so much clarification in the literature are the circumstances in which the law of Gibrat comes into effect. Examining this aspect may present many theoretical explanations why this law applies to certain industries, but does not seem to work for some others.

Before starting with the most famous Gibrat's Law, it is worth noting that much of the empirical component of his research was based on the manufacturing sector, although the growth rate of small and medium-sized enterprises can vary by industry. There are more recent studies distinguishing the manufacturing sector from the service companies, the latter are generally much smaller than the productivity industries, and thus a small service company grows more slowly than a company in the manufacturing sector of the same size[42]. Many researchers (Kraybill, 1992[43]; Johnson et al., 1999)[44] found that there is a negative

[40] Morone, P. and Testa, G., 2008. "Firms' growth, size and innovation – an investigation into the Italian manufacturing sector". Economics of Innovation and New Technology, 17 (4), 311-329.
[41] Raymond, L., Bergeron, F. and Blili, S., 2005. "The assimilation of E-business in manufacturing SMEs: determinants and effects on growth and internationalization". Electronic Markets, 15 (2), 106-118.
[42] Teruel-Carrizosa, M., 2010. "Gibrat's law and the learning process. Small Business Economics, 34(4), 355-373.
[43] Variyam, J. N., & Kraybill, D. S. (1992). Empirical evidence on determinants of firm growth. Economics Letters, 38, 31-36.

relationship between company size and growth in the service sector, and similar trends were observed in other sectors studied: farms in Austria[45] or pharmaceutical companies[46].

At the same time, Audretsch and Elston (2010)[47] find discoveries that contradict previous research, namely a positive relationship between the speed of a company growth and its size, taking into account different industries in Germany at different time periods.

There is speculation that small new entrants firms will be fueled by the gap between their minimum efficient scale[48] and their firm size, which will put them under strong pressure to grow rapidly or exit the market. This is especially true for those sectors of entrepreneurship where MES is generally higher than standard, as the discrepancy between firm size and MES will only worsen[49]. In companies operating within the minimum effective size or higher, such pressures do not exist, and growth, as specified in Gibrat's law, can be completely random and independent of company size.

In addition, in many sectors with high level of MES, it is likely that large companies will drive out small competitors, taking advantage of the fact that small companies are more likely to incur large losses in the short term[50]. Conversely, small companies tend to form in sectors with lower MES and higher chances of survival, despite the company's low growth rate[51]. In rare exceptions, companies may choose to adjust the company size to average in a specific sector with a high MES. However, mature industries show fewer opportunities for young firms to develop, subsequently, the latter tend to exhibit lower growth rates[52]. Thus, the fact that Gibrat's law works in some industries and not in others can be explained by the aforementioned phenomena, leading to the conclusion that the choice of experimental group is of great importance for the outcome. The growth of a company and its size become

---

[44] Johnson, P., Conway, C., & Kattuman, P., 1999. "Small business growth in the short run". Small Business Economics, 12(2), 103-112

[45] Weiss, C. (1998). "Size, growth and survival in the upper Austrian farm sector". Small Business Economics, 10(4), 305-312.

[46] Bottazzi, G., & Secchi, A. (2005). "Growth and diversification patterns of the worldwide pharmaceutical industry". Review of Industrial Organization, 26(2), 195-216.

[47] Audretsch, D. B., & Elston, J. A. (2010). "On the relationship between firm size and growth: Have we been asking the wrong questions?" Working paper presented at the Ratio Colloquium for Young Social Scientists, Stockholm

[48] MES level of output - The minimum efficient scale (MES) is best defined as the scale of production where the internal economies of scale have been fully exploited. The MES corresponds to the lowest point on the long run average cost curve and is also known as an output range over which a business achieves productive efficiency (FHS Economics).

[49] Strotman, H. (2007). "Entrepreneurial survival" Small Business Economics, 28(1), 87-104

[50] Scherman, R., and Willet, T.D., 1967. "Potential entrants discourage entry". Journal of Political Economy, 75, 400-403.

[51] Ericson, R. and Pakes, A., 1995. "Markov-Perfect Industry Dynamics: A Framework for Empirical Work". Review of Economic Studies, 62, 53-82.

[52] Coad, A. (2007). Empirical investigations into the characteristics and determinants of the growth of firms. Doctorat Sciences Economiques, Université Paris 1

independent as soon as the size of the company crosses a certain threshold (usually MES), which varies from industry to industry.

Fotopoulos and Giotopoulos (2010)[53] came to the same conclusion using a sample of manufacturing companies in Greece, namely, micro and small and young companies do not obey the Gibrat's law, unlike mature and old companies, where this random pattern is observed in most cases. In support of this claim, Lotti et al. (2009)[54] developed the market selection hypothesis, which states that the market selects some firms that survive market pressure and behave in accordance with Gibrat's law. Thus, it can be concluded that this law is valid only in the long term.

1.2.2. Environmental and Structural Factors of Company Growth

Growth in the development of small and medium-sized enterprises can be driven by various organizational factors such as productivity, including the company's ability to manage resources such as capital, personnel, occupations, practices and company structures, and to organize and transform the acquired knowledge into a product or service.

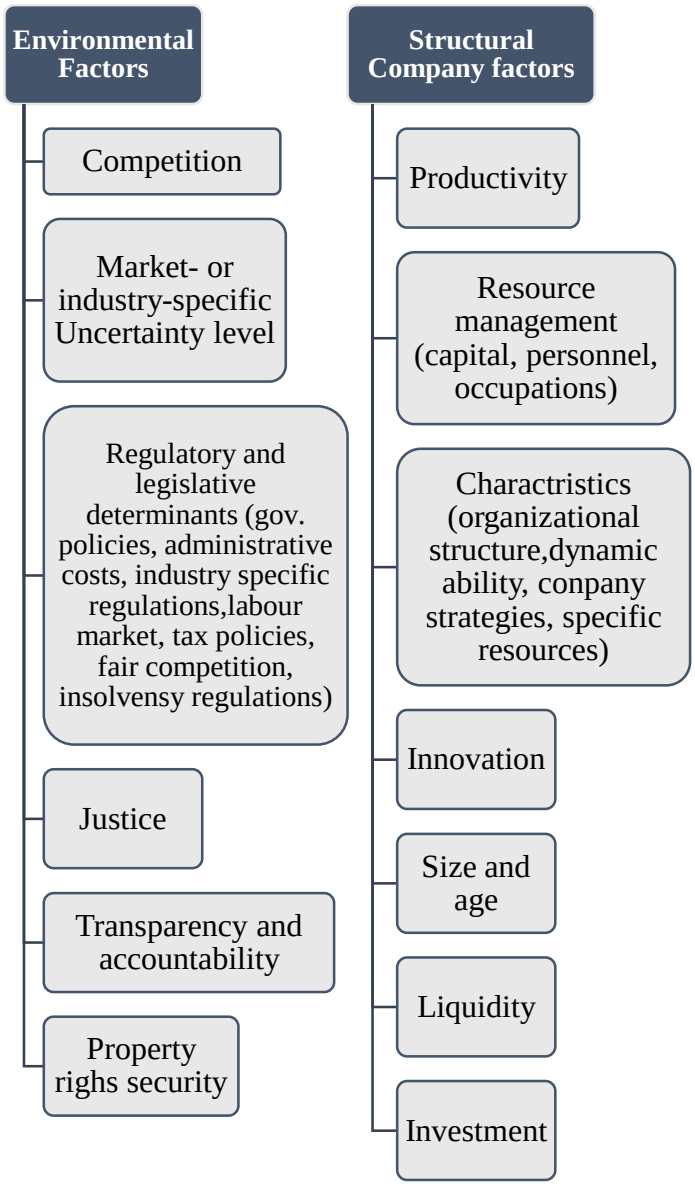
As indicated in many studies from various disciplines, these factors are: company characteristics, organizational structure, dynamic ability, company strategies, as well as specific resources at the disposal of the company[55]. For a clearer picture, a graph below summarizes all the findings, related to company growth.

Innovation is another widely studied indicator of company growth[56]. In innovative business sectors, a company is less likely to survive than in others, but at the same time, those that have survived exhibit a much higher rate of development than companies of the same size in other industries[57]. For example, in the Netherlands, among manufacturing companies of various sectors, the ability to find and apply innovation increases the company's chances of survival[58]. In Italy, Arighetti and Vivarelli (1999)[59], the ability and motivation to innovate, as

[53] Fotopoulos, G. and Giotopoulos, I., 2010. "Gibrat's Law and Persistence of Growth in Greek Manufacturing". Small Business Economics, 35, 191-202.
[54] Lotti, F., Santarelli, E., & Vivarelli, M., 2009. "Defending Gibrat's law as a long-run regularity". Small Business Economics, 32, 31-44.
[55] Sarwoko, E., Frisdiantara, C., (2016). Growth Determinants of Small Medium Enterprises (SMEs). Universal Journal of Management, 4(1), 36 - 41.
[56] (Geroski and Machin, 1992; Geroski and Toker, 1996; Roper, 1997; Freel, 2000; Botazzi et al., 2001).
[57] Audretsch, D. B., 1995. "Innovation, growth and survival". International Journal of Industrial Organization, 73(4), 441-457.
[58] Cefis, E., Marsili, O., 2006. "Survivor: The role of innovation in firms' survival." Research Policy, vol. 35, issue 5, 626-641.
[59] Arrighetti, A., & Vivarelli, M., 1999. "The role of innovation in the postentry performance of new small firms: Evidence from Italy". Southern Economic Journal, 65, 927-940

well as experience in innovative actions, were positive factors in the high growth rates in the further development of the company.

In addition to this, there are also environmental factors that also have a certain impact on the development of the company. So, for example, for many aspiring SMEs, competition can cause decline. Typically, most SMEs start their companies as an imitation of an existing large enterprise, and aim to provide a home or local market[60].



Graph 1. ***Differentiation between Environmental and Structural determinants of company growth.***

Created by author (See references [23,25,26,27,35])

Another important aspect that may influence the development and growth of the company is the uncertainty degree specific to the industry where the company operates. Every

[60] Baldwin, J., Gellatly, G., 2003. "Innovation Strategies and Performance in Small Firms." Cheltenham, UK: Edward Elgar, 375 pp.

stage of firm development process implies some degree of uncertainty. Uncertainty is characterized by promiscuity of unknowable outcomes in which entrepreneur is making decisions, whereas risk implies knowable outcomes under promiscuity. Thus, some industries conditioned with high degree of uncertainty may hinder the chances for new entrants and investment flow (this is the ambiance where Gibrat's law is most likely to be applicable). Self-employment is also affected negatively by a higher degree of uncertainty, due to risk aversion of entrepreneurs; however, at the same time same behavior does not seem to hold for entrants in high-technology fields, as for the United States[61].

Many theorists[62] explore the theory of irreversible investment[63] with regards to uncertainty and support the existence of negative relations between these phenomena. High level of uncertainty is found to be decreasing viabilities of irreversible investment to the uncertainty of demand[64]. In addition, while investment is adversely affected by CAPM[65] and company-specific uncertainties, the market- or industry-based uncertainty may show supportive effects[66]. However the market based uncertainties have different effects on companies depending on the country, namely, Rashid and Saeed (2017)[67] show that companies in Pakistan are sensitive to both types of uncertainties, whereas Xu et al. (2010) show that in China, market based suzerain ties may be positively restrained by the government.

Conversely, firms also tend to behave in risk-taking manner, specifically: the more risk – the more investment, which stimulates reinvestment, and for China, due to the fact that high uncertainty degree is inherent for emerging economies with high competition among firms. This is clearly the case, as Chinese companies tend to increase investment in response to rising market- and firm-specific uncertainties.

---

[61] Kan, K., and Tsai, W. D., 2006. "Entrepreneurship and risk aversion". Small Business Economics, 26, 465-474; Elston, J. A., and Audretsch, D. B., 2011. "Financing the entrepreneurial decision: An empirical approach using experimental data on risk attitudes". Small Business Economics, 36

[62] See: Leahy and Whitcd (1996), Kang et al. (2014), and Gulen and Ion (2015) for the United States; Bloom et al. (2007) and Rashid (2011) for the United Kingdom; An et al. (2016), and Khan et al. (2019) for China, Ma (2015) for Australia; and Rashid and Saeed (2017) for Pakistan. Also: Xu et al. (2010), Wang et al. (2014).

[63] Irreversible investment acknowledges that the value of capital may not be fully recoverable when resold. This simple generalization has rich implications for investment.

[64] Khan, M.A.; Qin X. and Jebran K. 2020 "The Sensitivity of Firms' Investment to Uncertainty and Cash Flow: Evidence From Listed State-Owned Enterprises and Non-State-Owned Enterprises in China" School of Business Administration, Dongbei University of Finance and Economics, Dalian, P.R. China, First Published January 29, 2020

[65] The Capital Asset Pricing Model (CAPM) describes the relationship between systematic risk and expected return for assets, particularly stocks. CAPM is widely used throughout finance for pricing risky securities and generating expected returns for assets given the risk of those assets and cost of capital.

[66] Baum, C. F., Caglayan, M. and Talavera, O. (2008), 'Uncertainty determinants of firm investment', Economics Letters 98(3), 282–287.

[67] Rashid, A., & Saeed, M. (2017). Firms' investment decisions—explaining the role of uncertainty. Journal of Economic Studies,44(5), 833–860.

1.2.3. Regulatory and Legislative Determinants

Given the fact that SMEs are of immense importance for the country, the government policies should also be established to facilitate unobstructed development and efficient development of SMEs through reduction of administrative costs and some other industry-specific regulations. Efficient regulation of production and labor market, tax policies, regulations on fair competition and insolvency problems, contractual relationships and justice are the main aspects that provide firm ground for competition, encourage investment and risk-taking attitudes among entrepreneurs. Examples of such may be simplification of administrative procedures; digitalization of variety of services: administrative, licensing, business development and advisory, legal services and others; optimization of taxation and increasing compliance through the development of data analytics and behavioral insights, which will in turn promote better cooperation between public sector and the needs and preferences of consumers. Naturally, countries increasingly promote principles of transparency and accountability, as well as participation – strengthening integrity and collaboration on all levels. Environment for competition should be established – ensuring that state-owned enterprises do not have advantage in access to resources compared to private enterprises, which will promote more expedient use of resources[68]. Any kind of regulatory frameworks that limit the access to market entry or support unfair competition that leads to the discrimination of SMEs, destabilize business dynamics and undermine innovation.

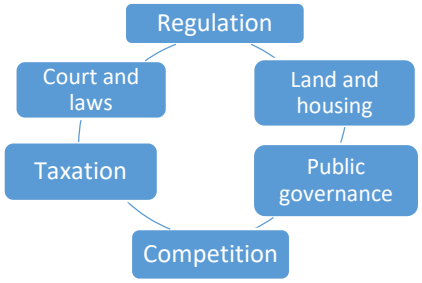
Enforcing compliance with contractual duties and civil justice are vital for ensuring the integrity of markets, SME growth, new partnerships and safe returns on investment[69]. Lack of transparency and presence of corruption are of a particular danger for SME, although have adverse effect on all the spheres, as they often lack the capacity to develop strategies for anti-corruption measures and push their own needs in the face of lack of opportunity to participate in public decision-making. Incompetence of public services and high administrative and bureaucratic burdens can also affect honesty - in these circumstances, SMEs are more likely than large firms to take detours and illegal ways to avoid this burden.

Property rights security – is essential for most of the SMEs, as land and buildings for offices are important to start off the business activities, and it affects access to loans – and a key to it is planning of the land use and adjustment of public and private investments, facilitation between various business activities and the land characteristics will create a certain ‘industrial symbiosis’ in economic environment.

[68] OECD (2017), Entrepreneurship at a Glance 2017, OECD Publishing, Paris, forthcoming. Page 8.
[69] Johnson, Simon, John McMillan, and Christopher Woodruff. 2002. "Property Rights and Finance." American Economic Review, 92 (5): 1335-1356.

Insolvency regulations are vital for the progress of the business, which may be facilitated through various regulations providing balance between the guarantees granted to investors and burden of overhead charges for entrepreneurs during the bankruptcy scenario. An efficient insolvency regulation will assist companies in access to external finance, restructuration of activities, save the reputation or encourage entrepreneurs to start the business again. In addition, limiting the overhead burden of entrepreneurs has proven to increase self-employment rates and number of entrants in many countries and raise amount of companies with higher human capital[70].

The situation and complexities, as well as market structure may vary from country to country the overall climate for entrepreneurship is evolving – the last two decades have seen the decline in entry barriers and administrative burdens, compliance costs in various sectors, such as labor laws, goods standards and certification[71]. There are some examples of efficient institutional and regulatory frameworks promoting SME growth in different countries. For instance, industrial research and pre-competitive development are subsidized and covered by government of Germany in order to stimulate innovation scope, as well as financing of various cooperation projects, including transnational ones (Federal Funding Advisory Service on Research and Innovation). In addition advisory and consultancy services – Chambers of Industry and Commerce, the chambers of skilled crafts and other BMOs are involved.



Graph 2. Regulatory and legislative determinants of the company growth (created by author).

Regulatory impact analysis (RIA) – is a popular technique currently being adopted and institutionalized, which gives opportunity to evaluate the outcomes of regulatory incentives and improve them, it also assists to evaluate related costs and advantages of a specific policy versus its goals, while also taking into account the associated costs and benefits of non-management alternatives. At the moment, this practice has become a requirement among the OECD countries, preceding the development of many primary and secondary regulations. In addition to this, the RIA also includes the opportunity for public opinion, namely, making

[70] OECD (2019), OECD SME and Entrepreneurship Outlook 2019, OECD Publishing, Paris, https://doi.org/10.1787/34907e9c-en.
[71] Ibid.

sure that a sufficient number of stakeholders' views have been taken into account, including with regard to draft drafts of potential regulations[72].

[72] OECD (2019), OECD SME and Entrepreneurship Outlook 2019, OECD Publishing, Paris, https://doi.org/10.1787/34907e9c-en.

2. SME SECTOR IN GERMANY AND LATVIA.

2.1. SMEs in Germany

2.1.1. Overview of SME Sector and Its Growth

As in European Union in general, in Germany SMEs are of great importance. Despite the fact that only 1 percent of world's population lives in Germany, about 50 per cent of the world's highest performing SMEs are from Germany. They generate 54 percent of total value added and 63.2 percent of employment, however, it is still less than EU average shares (56.8 and 66.4 percent respectively). Average value added productivity per person employed is equal to EUR 50,700 (2018) surpassing the EU average amounting to EUR 44,600. On average SMEs in Germany employ 7.6 workers, while EU average employment in SMEs is almost twice as less. of Small and Medium-sized Enterprises The size category distribution for German SMEs is also different from the EU average - micro companies account for much smaller share to the value added and employment, than small and medium sized companies.

Table 2.

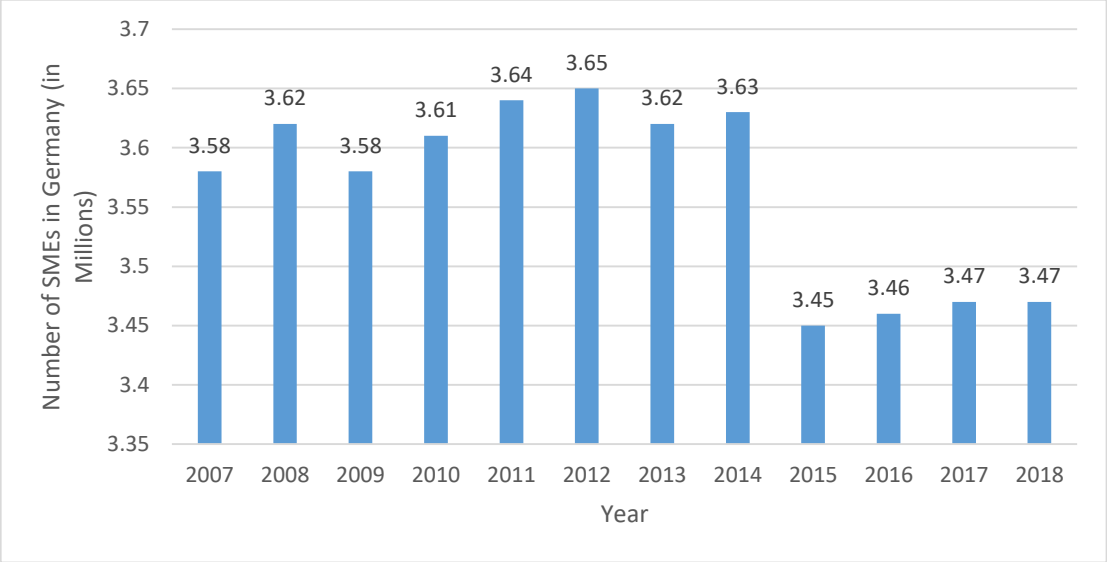
Productivity of German Small and Medium-sized Enterprises

SME by Number of Employees	*Gross Value Added per employee in thousands of EUR*
From 0 to 9 employees	42.7
From 10 to 19 employees	40.8
From 20 to 49 employees	46.9
From 50 to 249 employees	57.0

Sourse: Eurostat (2017)

German policy with regards to SME comprises several successful principles, which help to create favorable conditions for SMEs. In addition, SBA[73] was introduced in Germany in 2008, although, even prior to its introduction, certain policies dealing with almost all of the aspects of SBA were already in place.

[73] The Small Business Act for Europe (**SBA**) is the EU's flagship policy initiative to support small and medium-sized enterprises (SMEs). It comprises a set of policy measures organised around 10 principles ranging from entrepreneurship and 'responsive administration' to internationalisation (Germany 2019 SBA Sheet).



Graph 1. ***Growth of Number of SMEs in Germany (2007-2018)***

Source of information: IfM Bonn report on growth of number of SMEs in Germany, 2019

The graph above shows the number of Small and Medium sized enterprises in Germany (2007-2008) with dataset derived from IfM Bonn[74] and based on its definition of Small and Medium sized enterprises:

- Micro businesses employ up to 9 people and have an annual turnover up to EUR 2 million.
- Small companies employ up to 49 people and generate an annual turnover up to EUR 10 million.
- Medium-sized companies employ to 499 people and generate an annual turnover up to EUR 50 million.

As it is illustrated on the graph, the number of SME entrants in Germany is declining compared with previous year and even the year of economic recession (2008). In 2018, the overall amount of newly registered companies was 542,500, which is 1.3 per cent lower than in previous year[75]. The current lower level of SMEs can be explained by several reasons. Firstly, it can be connected to more critical assessment of the business environment and future expectations together with cyclical pace of the growth in number of SMEs. On the other side, it is also related to the growing number self-employed and freelance workers, reduction of number of the start-ups, connected to high demand for skilled workers. The number of deregistrations did not grow (0.0 per cent) in the same time period and amounted at 512,800,

[74] The Institute for SME Research Bonn - studies the "competitive situation of medium-sized companies", on the comparison of companies and on business management training and advice for medium-sized companies.
[75] Federal Statistical Office, 2019, Press Release No. 118 of 28 March 2019, available at: https://www.destatis.de/DE/Presse/Pressemitteilungen/2019/03/PD19_118_52311.html

there is still positive net gain of 29,700 companies[76]. Respective to economic development of Germany, the amount of bankruptcies decreased by 3.9 per cent in 2018 (19,302 companies), which represents the smallest level, since the establishment of Bankruptcy code in 1999[77]. At the same time, the number of start-ups decreased, which can be result of growing employment opportunities in the job market, that reduced the need to open a start-up in avoidance of unemployment[78]. Thus, the newly established start-ups entered market voluntarily, and hence, show higher business performance[79].

Table 1.

Growth rates in employment (FTE *) and sales of SMEs in Germany in 2019 compared to the previous year (2018) according to following characteristics

Characteristics of SME	Sales Growth	Employment Growth
R&D intensive manufacturing industry	2.6%	1.8%
Other manufacturing	0.7%	0.4%
construction	4.2%	1.9%
Knowledge intensive services	3.7%	3
other services	4.3%	1.5%
other industries	3.4%	1%
Less than 5 employees	3.9%	2%
5 to 9 employees	3.3%	2%
10 to 49 employees	4.1%	3.1%
From 50 employees	2.9%	1.2%
Company age: up to 5 years	17.3%	12.4%
Company age: 5 to 10 years	9.3%	6.1%
Company age: 10 to 20 years	5.8%	1.1%
Company age: more than 20 years	2.4%	1.4%
Entire middle class	3.5%	1.9%

[76] ibid
[77] 0 Federal Statistical Office, 2019, Insolvenzen von Unternehmen und Übrigen Schuldnern, available at: https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Unternehmen/Gewerbemeldungen-Insolvenzen/Tabellen/anzahl-derbeantragten-insolvenzverfahren.html and Federal Statistical Office, 2019, Press Release No. 091 of 13 March 2019, available at: https://www.destatis.de/DE/Presse/Pressemitteilungen/2019/03/PD19_091_52411.html, last accessed on 3.6.2019.
[78] DG GROW, European Semester Officer Report Berlin, May 2019
[79] KfW, KfW-Gründungsmonitor 2018, available at: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDFDokumente-Gründungsmonitor/KfW-Gruendungsmonitor-2018.pdf,

Source: de.statista.com[80]

Germany is succeeding in innovation, with research spending and innovation frequency being the highest among other European Union countries. 90.5 per cent of small companies (10 to 49 workers) and 87.9 per cent of medium companies (50 to 249 workers) brought in innovation[81]. Apart from this, Germany is prevailing in innovative companies, with regards to goods, production process, organizational structure and marketing innovations in comparison to all EU enterprises in 2008 (79.9 per cent)[82]. Manufacturing sector operates with the highest proportion of innovative companies, with 53 per cent of medium-sized companies introducing product innovation and 53.1 per cent succeeding in process innovation as for the years 2011-2013[83].

In author's opinion, the urge to create and offer innovation to the customers is a highly-efficient strategy in today's ever evolving global markets. It enables companies to stay afloat even in the environment where customer's preferences switch constantly, compete successfully on international arena, and become the leaders in innovation. It also contributes to product flexibility and upgrading of manufacturing equipment and tools, which is highly beneficial for all spheres of manufacturing activity.

In addition to that, German government is playing major role is success of Small and Medium-sized Enterprises. While in many countries governments take an active position in SME sector, Germany takes a more passive role, by creating favorable conditions for SME growth, without direct interference. The tax rate for SMEs in Germany are held on relatively small levels, despite the increase in tax rates on large companies. This has empowered some German SMEs to accumulate more capital and evolve into large companies with turnover more than billion EUR. In addition, a growing entrepreneur spirit among population, with all types of companies, from Multinational corporations to small enterprises being successful and showing big growth rates.

Apart from this, Germany potentiates proliferation of SMEs, which contributed to the growth of German economy on many levels. Companies, industries and manufacturing hubs are not concentrated only in urban areas, instead Germany aims to equally allocate employment opportunities and income distribution around the whole country, including rural areas. This policy accounted for stanch the pressure on urban areas and facilitate higher

[80] https://de.statista.com/statistik/daten/studie/261427/umfrage/umsatzwachstum-und-beschaeftigungswachstum-im-deutschen-mittelstand-nach-ausgewaehlten-merkmalen/
[81] Eurostat (2017): Database; available at: http://ec.europa.eu/eurostat/data/database
[82] Ibid. – (2012): Science, technology and innovation in Europe. Luxembourg: Publications Office.
[83] Abel-Koch, J., del Bufalo, G., Fernandez, M., Gerstenberger, J., Lo, W., Navarro, B., Thornary, B. (2015); SME investment and innovation: France, Germany, Italy and Spain, in KfW Group; available at: https://www.kfw.de/PDF/DownloadCenter/Konzernthemen/Research/PDF-Dokumente-Studien-undMaterialien/SME-Investment-and-Innovation-October-2015.pdf

incomes in all areas of Germany, which in turn lead to lower levels on welfare spending by government, as the population is able to take a good care of themselves. In the era of globalization, which is often described as contributor to inequality, large corporations in many countries are dominating the market and while small companies are non-competitive and regionally oriented. Meanwhile, German approach of even geographical distribution ensures fair allocation of the globalization gains throughout its whole territory. As a result, SMEs in rural areas are both providing jobs and showing high-standard performance, with 71 per cent of SME Champions being situated in peripheral areas and rural towns with population under 100,000 inhabitants. Another bright example of success is company MENNEKES Elektrotechnik GmbH & Co. KG located in a small town of 12,000 people, whose New Type 2 standard for charging plugs for electric vehicles was awarded to a design by the European Commission, which perfectly illustrates how companies from rural areas are able to set global standards[84].

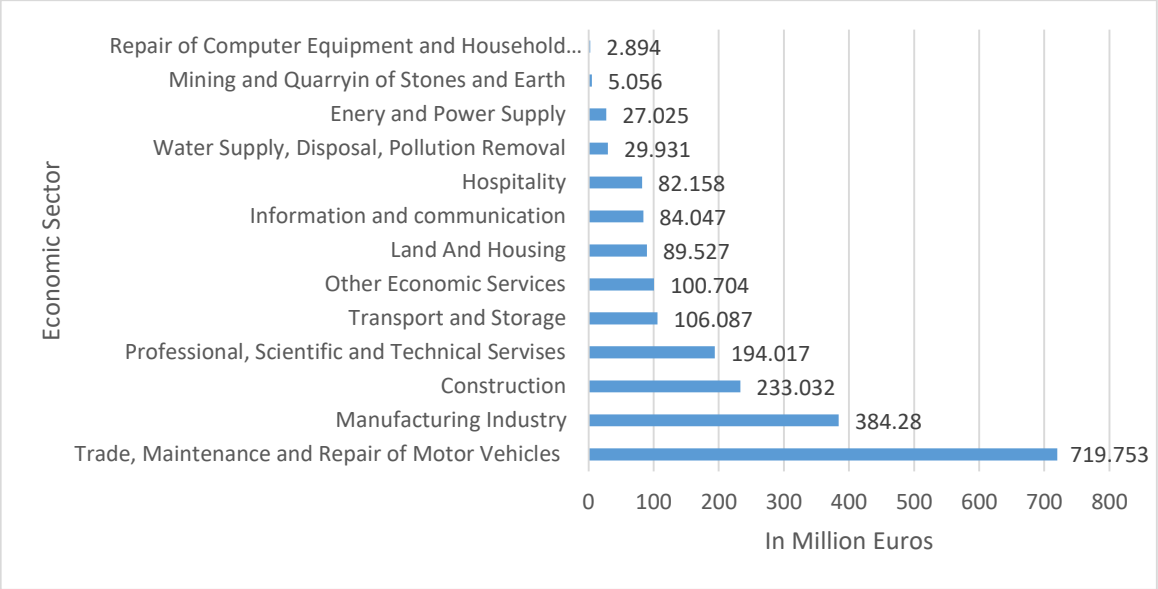
From author's perspective, Germany is managing outstandingly in terms of facilitation of SME sector's development. Most importantly, it attempts to distribute benefits generated by SME sector evenly actors all areas and the segments of population, thus supporting social well-being and equal distribution of income. Favorable tax policy should be also highlighted, as it relieves the burden from small enterprises and encourages future entrepreneurs. In addition, the significant emphasis on research and development within the manufacturing sphere is one of the most important aspects that have led Germany to the position of the largest and highest quality manufacturer and defined the far-reaching prospect of the manufacturing in Germany.

Another specific advantage of German Small and Medium-sized Enterprises is the average size of the firms. The firm level comparison of all SMEs across European Union indicates that average size of the revenue of German SMEs is EUR 36 Million, which surpasses average SME revenue in other EU countries like Italy, Spain, France, and Great Britain. Additional outstanding factors of German SMEs included in this study were high productivity, innovation potential and high degree of internationalism.

Since 2008 financial crisis, Germany has considerably improved its access to finance for SMEs and meliorated capital availability for the early-stage businesses. Such improvement was facilitated by such fund projects as High-Tech Start-up fund (High-Tech

[84] Langenscheidt, F., Venohr, B., 2015. "The Best of German Mittelstand – The World Market Leaders" (Ed.) Cologne: Deutsche Standards EDITIONEN, 1st edition, ISBN 978- 3-942597-48-7

Gründerungsfonds - 2005), microcredit fund (MikrokreditFonds – renewal in 2015) and ERP Mezzanine for innovation (ERP-Mezzanine für Innovation - 2017)[85].



Graph 2. ***Revenue of SME in Germany by Economic Sector (2018)***

Source: ibid.

It can be observed on the graph, that manufacturing industry of Germany is one of the largest according to its revenue, and, as it will be elaborated further in the following sub-chapter, German situation is unique in this case, due to the fact that as a rule, in highly-developed countries manufacturing sector is not that strong.

2.1.2. SMEs in Manufacturing Sector

Germany's manufacturing sector is dominated by mechanical engineering, which accounts for almost one third of the whole industry, followed by electrical engineering, industrial products, cars and car component production. Within from these high-volume markets, there are also variety of Small and Medium-sized specialized markets. The reason for a particular success of German companies is combination of high quality and unique features, which allows the main selling, therefore its unique selling proposition is based on value and excellence, and not on the price of goods. Desire to solve customer's basic problems and needs is the true driver of product innovations in German companies, not the more obvious scientific research progress. Top performing SMEs in Germany combine perfectly two dimensions – strong customer or market orientation and technological progress[86]. Such balance is vital for successful performance, as excessive concentration only

[85] European Commission 2019, European Semester: Country Report Germany, Brussels, 2019.
[86] Simon, H. 2007. Hidden Champions des 21. Jahrhunderts: Die Erfolgsstrategien unbekannter Weltmarktführer. Frankfurt/New York: Springer Verlag.

on one of these dimensions can threaten with either missing out on technological innovations, or customer needs, which will in turn result in inability to innovate "ahead of the market".

Despite the non-innovative nature of some sectors, such as pharmaceuticals, information technology and semiconductor production, they manage to succeed and dominate the market through incremental innovation, namely new application of innovations to satisfy customer-specific needs with rigorous precision in environment-friendly way.

Germany operates several institutions that provide research and assistance for improving efficiency of manufacturing SMEs – Fraunhofer Institutes, Steinbeis Centers of Management and Technology and less known Industrielle Gemainschaftsforschung program. These institutions are mainly concentrated on Collaborative Industry research and resolve prevalent problems and technological issues that industry encounters. Particularly Fraunhofer Institute ensures common research transferring technologies into commercialized goods, that can be exploited by both public and private companies[87]. Apart from this, it also offers bilateral precompetitive research for individual companies, including prototype production, across all sectors and technological platforms, encompassing such advanced technologies, as machining, optics, photonics, robotics, micro-electro mechanics, nanotechnology, etc.[88]. Any company across Germany can benefit from common support network and take part themselves in new researches and developments to extend their expertise in particular sphere.

Germany has a special category of Small and Medium-sized Enterprises, titled as "Hidden Champions". This title features leading medium-sized firms with high degree of internalization, technology advancement and strong ties to the territory of Germany, with proportion of them being family owned. Within this description, "hidden champions" account for a 48 per cent share of the market. Such companies on average perform 10 per cent of annual growth, own 5 times more patents per worker than large companies, are highly sustainable (as only less than 10 per cent were terminated during the 2008 financial crisis). These companies are among the best performing on the global market, however, they are generally not known to the general public. There about 2700 "hidden champions" globally, among which nearly a half of 1300 are German firms, meaning that no other country has such profusion of leading companies. "Hidden champions" have long life cycles and long-lasting leadership, established reputation, which enables them to establish long-term strategies, invest

[87] Shapira, Youtie, and Kay, "Building Capabilities for Innovation in SMEs," 8
[88] Fraunhofer Institute, "Institutes and Research Establishments," http://www.fraunhofer.de/en/institutesresearch-establishments.

in R&D, accumulate capital, compete internationally and not to be affected by the volatility of the global financial markets[89].

Technological advantage is not achievable without substantial investments. Average R&D expenditure as a proportion of revenues spent by German industrial SMEs is around 3.5 per cent, while SME or Mittelstand Champions spend around 7.2 per cent of total revenues[90]. The German SME Champions also invest twice as much in R&D expenditure in comparison to their international rivals within industrial sector[91]. In addition, the number of patents held by technical SMEs in Germany is considerably prevailing the amount held by heir international competitors of the same sector[92].

Vast majority of successful German SMEs perceive their "in-house" manufacturing procedures as a considerable strategic asset[93]. While many companies stick to such trends as outsourcing and offshoring (relocating of production activities to low-income countries), these SME leaders prefer their home country as a production hub. This theory suggests that innovative goods can be developed only in close interaction with manufacturing process. Subsequently, firms are trying to sustain their competitive advantage through concentrating main activities of organization at their headquarters, including fully consolidated manufacturing procedures and corporate R&D[94].

Second reason for success of German Manufacturing SMEs is cost competitiveness, flexibility of manufacturing networks, reached by cutting edge manufacturing equipment and most up-to-date organizational models. Namely, this approach implies efficient production of goods that are of an immediate need for the customers, including customized products that add a major competitive advantage for SMEs in Germany. Apart from customer gains, such approach also cuts overproduction, stockpiling of warehouses, benefits environment and considerably decreases the need for working capital.

German SMEs are also utilizing benefits of specialized institutions, established to foster long-term cooperation between various companies. Such Germany-specific institutions consolidate the common SME values and facilitate companies in positioning and pursuing

[89] Parella, J.F, Carmona, G., «The German Business Model: The Role of Mittelstand", Journal of Management Policies and Practices June 2018, Vol. 6, No. 1, pp. 10-16 ISSN: 2333-6048 (Print), 2333-6056 (Online), Article · August 2018 DOI: 10.15640/jmpp.v6n1a3

[90] Wissenschaftsstatistik 2012. 'FuE-Datenreport 2012 – Analysen und Vergleiche.' Essen: Wissenschaftsstatistik GmbH

[91] Strategy& 2013. 'The Global Innovation 1000: Comparison of R&D Spending by Regions and Industries,'

[92] Simon, H. 2007. Hidden Champions des 21. Jahrhunderts: Die Erfolgsstrategien unbekannter Weltmarktführer. Frankfurt/New York: Springer Verlag.

[93] The Best of German Mittelstand – The World Market Leaders Dr. Florian Langenscheidt; Prof. Dr. Bernd Venohr (Ed.) Cologne

[94] Langenscheidt, F., Venohr, B., 2015. "The Best of German Mittelstand – The World Market Leaders" (Ed.) Cologne: Deutsche Standards EDITIONEN, 1st edition, ISBN 978- 3-942597-48-7

long-term strategies. Business culture and favorable institutional framework produce a unique convergence of "economic culture" of Germany, which in turn, contributes to innovation, development and production of high-value added premium quality goods fitted to customers' needs, and represents main comparative advantage of Germany on the global market[95].

Manufacturing sector of economy adds up to 25 per cent to German GDP, and this fact explains the prominence given to this sphere by German government. Manufacturing sector of Germany accounts for the biggest proportion oa exports, although in majority of advanced economies service sector constitutes the biggest part of GDP and exports. In contrast with more advanced economy of United States, Germany exceeds twice the US level of exports of manufactured goods, and the share of manufacturing in GDP is around 10 per cent, as in majority of other developed states[96].

Thanks to Germany's strong manufacturing sector contributing to high share of exports, Germany is having strong and consistent account surplus of about 8 percent of its GDP or 274 Billion US Dollars. Currently this indicator is the highest in the world, surpassing even mainly manufacturing Chinese economy account surplus of 141 Billion US Dollars or 0.99 per cent of its GDP. The most important contributor to German success in exports are not only large and well-established in the market multinational companies, but also big amount Small and Medium-Sized companies. SMEs in Germany are mainly statistically categorized under the term Mittelstand and they are connotated as highly flexible, innovative, customer oriented, with high degree of social responsibility and a family-type corporate culture[97].

The powerful manufacturing sector of Germany and its considerable contribution to GDP did not receive enough prior research, which may be explained with country's industrial history, technical innovation system and favorable geostrategic location in Europe. Germany is located in the very heart of Europe, bordering nine other countries and besides, it lies in between Asia and Americas, which in turn enables shorter time in transportation. In addition, Germany is known for its national innovation system enabled by its strong technical universities basis, which led to groundbreaking innovations in technical, chemical, engineering and theoretical spheres. The mark "Made in Germany" has long established itself as symbol of high quality and reliability. Vast number of German world market leading companies (about 32.5 per cent) were established well before the First World War, successfully coping with substantial turmoils of the 20th century, thus creating a strong ground

[95] Abelhauser, W. 2003. Kulturkampf: Der deutsche Weg in die neue Wirtschaft und die amerikanische Herausforderung. Berlin: Kulturverlag Kadmos.
[96] Langenscheidt, F., Venohr, B., 2015. "The Best of German Mittelstand – The World Market Leaders" (Ed.) Cologne: Deutsche Standards EDITIONEN, 1st edition, ISBN 978- 3-942597-48-7
[97] The World Bank Data https://data.worldbank.org/indicator/BN.CAB.XOKA.GD.ZS?locations=DE

for German competitiveness in the present time. For example, already prior 1914, several German chemical colorant companies – BASF SE, Hoechst AG and Bayer AG accounted for 90 per cent share of the world market. Another remarkable enterprise of Germany Robert Bosch GmbH launched its first international sales office in Great Britain in 1898, second in the USA in 1906 and already by 1909 company established trade connections with Asia, in particular, China. By the year 1913, company was already generating 88 per cent of its sales internationally, outside of Germany[98].

From author's standpoint, Germany is highly successful in majority of industries nowadays, partially due to the fact that it had long established tradition of industrial production, manufacturing, pharmaceuticals, and companies that possessed exceptional expertise in aforementioned spheres for afore half a century, or even more. Germany's government is not taking a proactive position regarding SMEs because there is no need to do so, to intervene and make changes, stimulate or enlarge any industries. The actions that government is taking are purely facilitating, such as tax policies or research institutions that support SMEs. However, there is an opinion in European Union, IMF and third countries, that the Government of Germany should undertake control of its manufacturing industries with an aim to decrease production volumes. Such opinion is conditioned with a belief that German constant account surplus generated by manufacturing sector is able to cause financial imbalancesб namely it the account surplus in Germany reflects in account deficits in other countries, thus slowly raising implicit protectionist spirit among nations.

2.2. SMEs in Latvia

2.2.1. Overview of SME Sector and Its Growth

Latvia achieved a prominent development in improving business environment, which was noted by World Bank's Research Doing Business 2020 by improving Latvia's rank by 12 positions to 19th place in Ease of Doing Business Ranking in comparison with year 2011 rating where Latvia occupied 31st position. Among European countries, Latvia accounts for 6th place in Ease of Doing Business Ranking, surpassing Germany. In addition, Latvia was also marked as an economy, establishing best regulatory performance list, it gained 15th position in Ease of getting Credit and Contract Enforcement Ranking and 16th in Paying Taxes Ranking. Latvia facilitated starting the business by decreasing base capital requirement and establishing common application for the registration of the company and value added tax.

[98] Bosch Website 2015. 'Internationalization.' [online at http://www.bosch.com/en/com/ bosch_ group/history/theme_specials/internationalization/internationalization.html]

Latvia is experiencing an increase in the number of company registrations, and apart from this existing business is also benefiting from state support and employment providers, which in turn enabled recovery of economy from crisis. The global economic crisis reflected on all sectors of SMEs, which employ prevailing proportion of population. A European Union developed policy, embracing three directions – promotion of creation of micro companies and start-ups, development of support measures and provision of finance access. In Latvia, this policy not only facilitated general economic growth, but also contributed to tackling such economic and social problems as unequal income distribution and unemployment. In addition, Latvia is performing above EU average within five principles of SBA profile – entrepreneurship, responsive administration, state aid and public procurement, access to financing and single market[99], which allows country to support powerful financial and entrepreneurial conditions for SMEs. The rest of the areas are along with EU average, with exception only for single area of skills and innovation, including digital technologies, which is falling behind other EU countries and being the only weakness in overall Small Business Act profile of Latvia. A survey conducted by SEB bank of Latvia indicates that only 20 percent of SMEs in Latvia are operating online channels for sale of products or services, which is smaller than indicators of neighboring countries Lithuania (22 percent) and Estonia (25 percent).

In addition to that, Latvia is also undergoing already 3rd year in a row with total number of company deregistration exceeding the number of newly registered companies. Although the overall number of company registrations is growing at a moderate pace of 4.4 percent increase from 10210 in 2017 to 10660 for 2018, amount of deregistration is surpassing it with 16480 and 20745 respectively, equaling to 25.9 percent[100]. The account for the net loss of 10085 enterprises is attempt of the Latvian government to eradicate money laundering cases through deregistration of economically inactive enterprises from the register[101]. Only on 14th January 2019 6647 companies were deleted from the register[102].

In Latvia SMEs of non-financial character account for 79.4 percent of workplaces and 71.1 percent of value added, that significantly surpasses EU respective SME averages with 66.4 percent and 58.8 percent. Value added for SME experienced accelerated growth rates of 14 percent in 2017-2018, higher than 11.5 percent in period between 2016 and 2017, considerably exceeding previous years' modest indicators of 2.4 percent in 2015-2016 and 3.9

[99] SBA Fact Sheet 2018
[100] Ministry of Economics, Latvia, 2018, Economic Development of Latvia, available at: https://www.em.gov.lv/files/tautsaimniecibas_attistiba/leap/leap_2018-en.pdf
[101] Lursoft Statistika, available at: https://www.lursoft.lv/lursoft_statistika/?&id=3,
[102] Lursoft Blog, available at: http://blog.lursoft.lv/2019/02/18/14-janvari-likvideto-uznemumu-vairak-neka-citkart-visa-gadagaruma/

percent in 2014-2015; which resulted in the total value added two-digit increase of 29.9 percent during the period 2014-2018 and 6.3 percent increase in employment. The major contributor to value added growth of SMEs are small firms, that experienced an increase in 36.7 percent in period 2014-2018, while in terms of employment increase micro firms had a leading position with 10.8 percent over the same period. However, productivity per person employed in SME sector is slightly lower than EUR 18000, which is substantially lagging behind EU average of EUR 44600.

In Latvia SMEs play a substantial role in GDP and labor market formation, and are governed by the Commercial and Civil Law. Small and Medium-sized companies are defined by Cabinet of Ministers Regulations No 964 and 800 according to the Law on Control of Aid for Commercial Activity as follows:

- Micro companies employ not more than 9 people and generate an annual turnover that does not exceed EUR 2 million with total sum of annual balance under EUR 2 million;
- Small companies employ not more than 49 people and generate an annual turnover that does not exceed EUR 10 million with total sum of annual balance under EUR 10 million;
- Medium-sized companies employ not more than 249 people and generate an annual turnover that does not exceed EUR 50 million with total sum of annual balance under EUR 43 million;

Total number of SMEs in Latvia as for the year 2019 equals to 114131, out of which micro enterprises account for 91.6 percent or 104705 companies, small enterprises for 7976 and the share of 7 percent and medium-sized constitute 1.3 percent or 1450 of enterprises. A table below aims to compare main SME indicators of Latvia, such as number of companies, employment and value added with EU average[103].

[103] European Commission, 2019 SBA Fact Sheet, "SME Performance Review Latvia"

Table 3.

Basic figures on SMEs. Comparison of Latvian indicators to EU average.

Class size	Number of enterprises			Number of employees			Value added		
	Latvia		**EU-28**	**Latvia**		**EU-28**	**Latvia**		**EU-28**
	Number	**Share**	**Share**	**Number**	**Share**	**Share**	**Number**	**Share**	**Share**
Micro	104,705	91.6%	93.0%	217,364	33.2%	29.7%	2.7	21.0%	20.8%
Small	7,976	7.0%	5.9%	158,454	24.2%	20.1%	3.1	23.9%	17.6%
Medium-sized	1,450	1.3%	0.9%	143,879	22.0%	16.8%	3.4	26.3%	18.0%
SMEs	**114,131**	**99.8%**	**99.8%**	**519,697**	**79.5%**	**66.6%**	**9.3**	**71.1%**	**56.4%**

Source: Structural Business Statistics Database (Eurostat). Estimates delivered for 2018

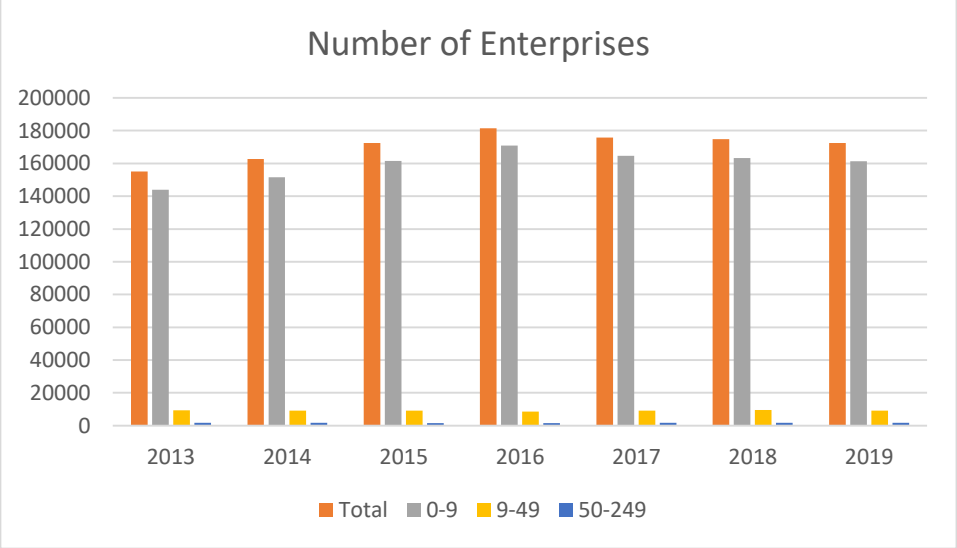
Considering realization of the Small Business Act for Europe (SBA) introduced by European Commission in December 2008, which envisages a framework policy for SMEs in order to promote entrepreneurship, Latvia performs on good level. Apart from having competitive SBA profile, it has also improved its performance in all the SBA spheres and successfully promoted entrepreneurship. However, challenges still remain: one of the main is to boost productivity and competitiveness through increasing value added and stimulate innovation and digitization.

Prevalent proportion of SMEs are manufacturing, wholesale and retail trade, adding in total 44.9 percent to SME value added. Country's manufacturing sector of SME performed fastest growth rate, compared to other sectors of economy after the 2008 financial crisis. In this particular sector, they generate almost 70 percent of value added, significantly overcoming EU average of 41.6 percent. Persistent growth in this sector can be explained by high productivity and competitiveness of Latvian manufacturing companies, which can be explained by nature of the sector being more export oriented, accompanied with state aid programs and growing expenditure among EU member-states[104].

The sector of wholesale and retail trade has a slightly different tendency compared to manufacturing: although it accounts for 77.5 percent of value added and surpasses EU average of 66 percent, it shows a decreasing trend over the past several years in terms of both employment and value added. The reason for such decrease can be explained by growing competition, dominance of bigger companies, particularly in food sector, and multinational companies, that start appearing in Latvian Market. In addition, altering consumer behavior, that gives more preference to fast and efficient shopping in big retail stores.

[104] European Commission, 2019 SBA Fact Sheet, "SME Performance Review Latvia"

From author's perspective, the downfall tendency, can be also attributed to business cycles. Business cycles are known as fluctuations in economic activity, and decreasing employment and value added may be the outcomes of business cycles and the trend can change for an increasing one in future. The cycles can be periodical, however, it is difficult to make a prognosis on when it will acquire an upward trend. Concerning the food industry and changing behavior of the customers, it is possible to reverse through offering exclusive or new products, forming and strengthening new customer beliefs and attempting to transmit messages with the products offered (e.g. traditional food, vegan). In addition, there is a growing tendency among customers that encourages to support the small businesses and efforts of the entrepreneurs to create new and exclusive offers.



Graph 3. ***Economically active enterprises in Latvia according to the number of employees***

Source: Central Statistical Bureau of Latvia SRG030. (NACE Rev. 2)

The table above illustrates the classified according to the number of employees economically active companies in Latvia. According to the graph, in Latvia, as in many other countries, micro companies account for the biggest share of all companies in the country.

2.2.2. SMEs in Manufacturing sector

Manufacturing sector continues positive growth pattern over the period 2014-2019 and strongly facilitates growth of Latvian economy. Sustained reduction of production costs, particularly employment costs[105] resulted in increasing competitiveness of Latvian enterprises of all sizes. In addition, a further government support in amount of EUR 377 million was provided by Latvian Ministry of Economics predominantly to manufacturing sector, in order

[105] Ministry of Economics, Latvia, 2018, Economic Development of Latvia, available at: https://www.em.gov.lv/files/tautsaimniecibas_attistiba/leap/leap_2018-en.pdf,

to boost competitiveness of Latvian SMEs[106]. In 2018, the value added for SMEs of manufacturing sector outreached its pre-crisis indicator of by 33.6 per cent, while employment has experienced 8.0 per cent lag compared to 2008 level.

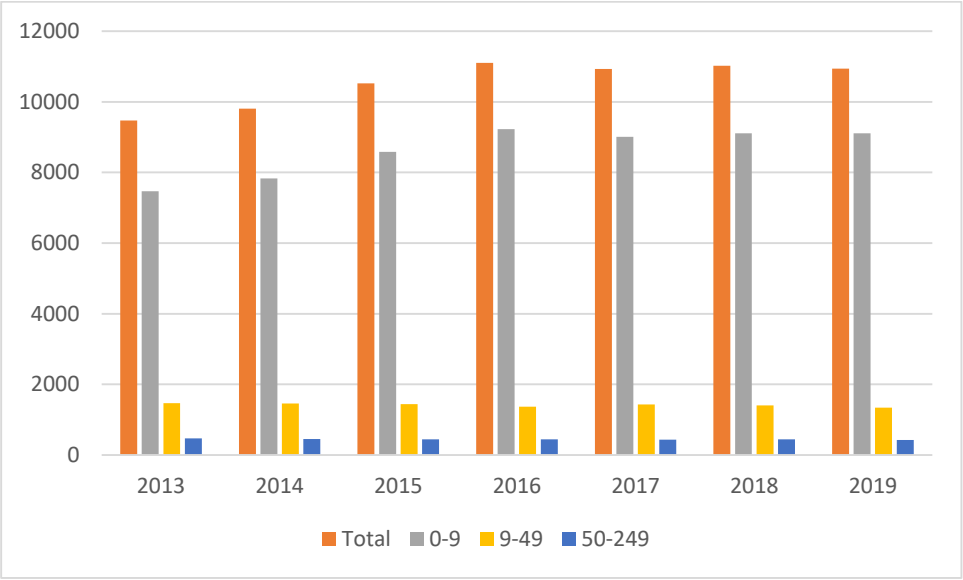
Development of manufacturing sector in Latvia is facilitated by growing competitiveness of producers and conductive dynamics in export markets. Year 2017 was noted with an accelerated increase in production volumes, while 2018 and 2019 growth rates slightly alleviated.

In 2019, the main driver of manufacturing was enabled due to production of basic metals, computers, electrical and optical equipment. At the same time manufacturing sector related to production of wood and wood goods sustained the same to the previous year growth rates, while third most important sector of food production saw a modest decline in the growth rate.

In June-August 2020, manufacturing volume has decrease by 3.5 per cent compared to the previous year. Industries, such as vehicles and metal processing experienced substantial decline, while electrical engineering and electronics sector, wood processing sector have grown. Over the same period, manufacturing turnover lowered at present costs, resulting an increase in exports, but decline in domestic sales[107].

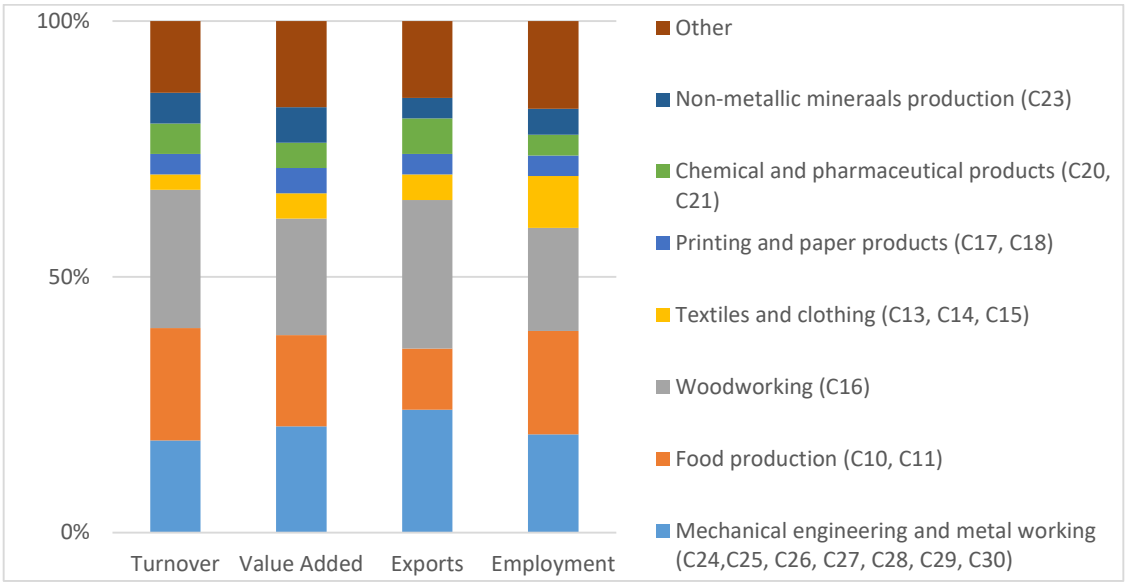
Latvia established and executed abstemious number of policy measures with regards to environmental sphere since 2008, which attained in recently its major focus of strengthening industrial energy efficiency. In 2015, a wide range of financially supportive programs and energy efficiency laws were introduced, and in subsequent year Latvian government designated grant programs, that foster efficient use of energy resources, lower energy consumption and facilitate conversion to renewable energy sources within manufacturing area[108].

[106] Ibid.
[107] Ministry of Economics of the Republic of Latvia, Central Statistical Bureau, 2020 “Macroeconomic Review of Latvia”, ISSN 2592-8538
[108] European Commission, 2019 SBA Fact Sheet, “SME Performance Review Latvia”



Graph 6: ***Economically active enterprises in Manufacturing Sector according to the number of employees***

Sourse: Central Statistical Bureau of Latvia SRG030. (NACE Rev. 2)



Graph 7: ***Structure of the Manufacturing Sector in Latvia (2019) – % of the total manufacturing***

Source: Association of Mechanical Engineering and Metalworking Industries of Latvia

Mechanical engineering and metal working has long been one of the substantive sectors of industry in Latvia. Nowadays, this sector has established itself to compete in global markets, performing predominantly export-oriented contract manufacturing works, develops its productivity and value added. About 80 per cent of this sector's output is exported, with 66 per cent of exported manufactured goods heading to European Union countries. In 2019 it contributed 24 per cent to the total exports of the country, namely EUR 5.3 billion, 19 per

cent to the employment and 18 per cent to the whole manufacturing turnover. In 2019 this sector employed almost 23,600 workers[109].

Pursuant to NACE2 classification[110], mechanical engineering and metalworking sector encompasses several branches, listed as follows:

- C24 - Manufacture of basic metals
- C25 - Manufacture of fabricated metal products, except machinery and equipment
- C27 - Manufacture of electrical equipment
- C28 - Manufacture of machinery and equipment n.e.c.
- C29 - Manufacture of motor vehicles, trailers and semi-trailers
- C30 - Manufacture of other transport equipment[111]

The Latvian Mechanical engineering and metalworking sector possesses multiple advantages. Firstly, Latvia offers highly competitive labor force in terms of skills and costs ratio - multilingual employees, with strong educational and training backgrounds, corresponding to European Union standards, thus enabling use of the most innovative technologies and equipment. Secondly, Latvia is situated in a favorable geo-strategic location, between Europe and Asia, and managed to develop impeccable logistics infrastructure, which allows to shorten the delivery time of the orders.

Current sector performed the highest growth rates of average rate of about 20 per cent annually during the pre-crisis period. Such rapid development was fostered by both active international trade and domestic demand and fueled by active introduction of technological upgrades in 2004-2005 and financing by EU funds. Although the crisis period has decreased production volume by 40 per cent, just like in many other EU countries, already in the year 2012 Latvia achieved historically highest levels of production and export volumes in this sector[112].

Since more than a half of Latvian territory is covered with forests, which is by far twice bigger than world's average, country has a long developed its forestry industry. Wood and timber industry is a backbone of Latvian economic trade balance. In 2019 exports exceeded imports by EUR 1.7 million. Almost a half of forests in Latvia are owned by state and operated through state stock organization Latvijas Valsts Meži (Latvian State Forests). The good condition of forests and effective forest regeneration, with 44,700 ha of forests regenerated in 2019, out which 65% were private forests, Latvia manages to develop this

[109] Investment and development agency of Latvia
[110] Statistical classification of economic activities in the European Economic Community
[111] Ibid.
[112] European Commission, 2019 SBA Fact Sheet, "SME Performance Review Latvia"

sector without considerable environmental damage. Around 325 companies in the forestry sector are certified according to FSC requirements and more than half of forests are certified according to PEFC system. Forestry is the highest exported industry in the country, comprising 20 per cent of total exports in 2019[113]. Country exports about 71 per cent out of the total forestry industry output or 2.6 billion for 2019, where sawn wood, fuel wood and round wood account for the largest share (EUR 693 million, EUR 467 million and EUR 234 million respectively). The main export countries are Estonia, Sweden, Germany and the United Kingdom.[114]

Electrical engineering and electronics industry of Latvia has been well established and reputable since the Soviet era. One of the best known Latvian factory VEF became famous for its miniature cameras, telephones and radios. This industry is recognized as the most high-value added due to the profound government efforts and skilled professionals working in this industry. Nowadays, Latvia has nearly 300 companies comprising the electrical engineering and electronics industry, that manufacture wide range of high-quality acoustic systems, wireless data transmission tools, industrial optics, telecommunication systems, nuclear electronic products, monitoring devices that have a big civil, industrial and scientific demand. The industry exports around 90 per cent of its total output internationally, competing with giants of telecommunication industries like Siemens Networks, Eriksson and Alcatel within a range of niche product markets[115].

Due to the short life span of electronical goods, the key to outstanding performance in this sector is the modern equipment and constant monitoring of trends. International success of this industry was also facilitated by high-skilled employees, advanced technologies and creative solutions. Small and Medium-sized companies of this industry provide extremely cost-effective solutions, immediate scale and high-quality engineering and support services. This sector is very conductive thanks to virtuous telecommunication systems and large scale R&D expertise.

The industry experienced a rapid growth since country joining the European Union, the output of the sector has tripled and remained steady afterwards. In 2019 the total output of electrical engineering and electronics industry has amounted in EUR 700 million, out of which EUR 633.6 million was exported. Latvia exports its E&E industry output to 149 countries worldwide, about a half (42 per cent) of the exported output was shipped within EU countries. Apart from this, the main exporters outside the EU are Russia and USA. The share

[113] http://certusdomnica.lv/en/agenda/wood-and-timber/
[114] Investment and Development Agency of Latvia
[115] Investment and Development Agency of Latvia

of exports continues an upward trend, signifying the growing competitiveness of the country[116].

Table 1.

Comparison of German and Latvian SMEs sector

	Germany	Latvia
Advantages	Highly R&D intensive, with great number of specialized and subsidized research institutions (e.g. Fraunhofer Institute)	Ranks 6th in Ease of Doing Business rating, surpassing Germany
	Lower tax burden for SMEs in comparison to Large Companies	Increase in number of company registrations.
	Equal allocation of SMEs, and thus, employment and income distribution	Strong Manufacturing industry with high growth rate
	Hidden Champions – globally leading SMEs	Increased Competitiveness
	Simplified access to finance and assistance from non-profit banks	Large Production Volumes
	High Value-added, famous and established quality of German goods	Wholesale and Retail industry is also growing fast, with value-added surpassing the EU average
	Long history of manufacturing expertise	Favorable geostrategic location and strong logistics
	In-house manufacturing	Highly-sustainable forestry industry
Disadvantages	Eastern part of Germany is still lagging behind	Small proportion of online sales of products and services, 20 per cent
	Decline in working population, even with high migration rates.	General population decline

Source: Created by author as a summary of the chapter

According to the author's opinion, Latvia has a highly-competitive profile in various economic sectors. Notably important is a sustainable forestry industry, in which Latvia shows a proficient excellence and can serve as an example for other countries. Additionally, despite

[116] Ibid.

quite successful electrical engineering and electronics industry, it would be highly beneficial for the sector in general to establish governmentally subsidized research centers, дулу Fraunhofer Institutes in Germany, that will undoubtedly reinforce electrical engineering and electronics industry and contribute to development of other sectors.

3. STATISTICAL ANALYSIS OF SIZE AND AGE RELATION TO SME GROWTH IN GERMANY AND LATVIA.

3.1. Methodology of the research

The following research attempts to conduct a quantitative analysis of secondary data using a statistical method. The analysis of the data will be performed using the statistical method of regression analysis in order to test the relationship between variables age, size and revenue of the company. The quantitative technique used in this research is mainly data collection.

For the statistical analysis there were chosen 100 Small and medium-sized enterprises of manufacturing industry for Latvia and Germany. The data on company size, age and revenue was found on publicly available free resources and databases. The statistical analysis was performed through SPSS statistical software, with application of regression analysis in order to find out whether size and age contribute to the growth of the company.

Limitations of the research: The data on company size, age and revenue was collected from publicly available resources, as the governmental data sources have restricted access, e.g. allowing only companies to research on their competitors and prospective partners, or monetary subscriptions. The sample size and the choice of enterprises is attributable to the availability of data on it in the internet. The companies collected are part of the manufacturing industry, which follows the disagreement on Gibrat's law application and allows to narrow down the sector.

Data sources for Latvia and Germany: ABC Online Germany, Europages, AISE, BDI – the official German Export Database, Networld Europe, Dun & Bradstreet Business Directory, Ezilon Euroope Directory.

3.1.1. Regression Analysis and its Assumptions

Regression analysis is a reliable method for determining the variables that affect the topic of interest. It is a range of statistical method, utilized in order to measure the relationship between dependent variable and one or several independent variables. It is used for assessment of the strength of the relationship between variables, for further modelling of the relationship between them. This process assists to confidently identify which variables happen to have the most impact, which can be ignored and how these variables influence each other.

In order to perform the regression analysis fully, it is important to distinguish following terms:

Dependent variable – is the main factor or variable that should be predicted through regression analysis.

Independent variable(s) – is(are) the hypothesized factor(s) that should have an impact on the dependent variable.

When attempting to conduct a linear regression, several assumptions should be fulfilled, with regards to the outcomes and the predictors. The assumptions about linear regression are the necessary conditions to achieve before drawing conclusions about the model estimates, or before utilizing model in order to make other predictions.

Firstly, the main assumption for a regression analysis is that the relationship between the dependent and independent variables is linear.

Secondly, the assumption of equal variance implies, that the residuals should be randomly distributed around the 0 line.

Thirdly, the variance of response does not change as the value of independent variables increases, indicating absence of homoscedasticity.

Fourth assumption is absence of autocorrelation, that is independence of observations from each other, which can be an often problem with time-series datasets.

Regression analysis comprises several types, such as linear, multiple linear and non-linear. The most commonly used models are linear and multiple linear. Non-linear regression analysis is predominantly used for more complex datasets where dependent and independent variables have a no-linear relationship.

For this paper a method of multiple regression analysis is applied. Multiple linear regression analysis is analogous to the simple linear regression, with only difference of presence of multiple independent variables in the model. The mathematical representation of multiple linear regression is following:

$$Y = a + bX_1 + cX_2 + dX_3 + \epsilon$$

Where:

Y – Dependent variable

X1, X2, X3 – Independent or explanatory variables

a – Intercept

b, c, d – Slopes

ϵ - Residual (error)

Multiple linear regression maintains the same conditions as simple linear regression. Yet, since there are more than one independent variables in the model, there is one more mandatory condition for multiple linear model – non-collinearity. Non-collinearity exists when no (or minimum degree) correlation between the variables could be observed. Otherwise, if collinearity is present in the model and independent variables indicate high degree of correlation to each other, it will be complicated to estimate the true relationships between dependent and independent variables[117].

The following regression analysis attempts to estimate the relationship between independent variables such as size and age of the company and dependent variable of company revenue. Such analysis was inspired by the disputes and highly varying opinions and research results on Gibrat's Law, with many researchers supporting that standpoint, and some finding the contradicting outcomes, for instance Audretsch and Elston (2010) and Fotopoulos and Giotopoulos (2010). For the research were chosen manufacturing enterprises specializing in food production, timber and plywood, glass, chemical, equipment and machinery manufacturing. More illustratively, the multiple linear regression with following equation:

$$Y = a + bX_1 + cX_2 + \epsilon$$

With all the components being same, except variables:

Y – company revenue;

X1, X2 – size and age of the company.

During the regression analysis was utilized one model, using following variables:

Dependent variable or Y – Revenue of the company

Two independent variables or X1, X2 – Size and age of the company.

All variables presented in SPSS were entered in usual fashion.

Hypothesis: In line with previous findings, it can be hypothesized that growth in manufacturing SMEs in Germany and Latvia is not related to the traditional firm characteristics of size and age.

[117] UCLA Institute for digital research & Education Statistical Consulting, Regression Analysis Annotated Output https://stats.idre.ucla.edu/spss/output/regression-analysis/

3.2. Effects of Size and Age on SMEs in Latvia. Interpretation of the Results

The following explanations of the regression outcomes are based on the database of 100 German SMEs operating in manufacturing industry. The average age of the selected German SMEs is 28.7 years and average amount of employees is 42.3. After conducting regression analysis with the usage of SPSS Statistical software, the following result were discovered, which will be explained in details below.

Table 1.

Model Summary and Overall Model Fit (Germany).

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,757[a]	,573	,564	2,52062	1,483

a. Predictors: (Constant), Size, Age

b. Dependent Variable: Revenue

Source: Obtained from the Regression output list. Regression was performed by author.

R – is the square root of R-Squared and it stands for the correlation between observed and predicted values.

R-Square – often referred to as the coefficient of determination, indicates the variance proportion of the dependent variable (in this case revenue of SMEs) which might be predicted from the independent ones (size and age of the company). The value of R-Square shows 0.573, meaning that 57 per cent of the variance in revenue can be predicted from independent variables of size and age. This is value shows the extent of the strength of variable interplay and does not indicate the degree to which any of the independent variables influence the dependent variable.

Adjusted R-Square – measurement attempts to ensure a more precise estimate to the value of R-squared for the population. Sometimes in attempt to improve the model, more predictors are added to it, and it is possible that those predictors contribute to explaining the variance of the dependent variable simply by chance. By adding more predictors in the model, while R-square is growing, it may be just due to the chance variation in the selected sample. Adjusted R-square is calculated with the formula 1-((1-Rsq)(N-1)/(N-k-1)). In this particular case, the number of observations is relatively big and the number of predictors is 2, which explains small variation between the R-square and adjusted R-square.

Table 2.

ANOVA Table as an outcome of Regression Analysis.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	817,971	2	408,986	64,371	<,001[b]
	Residual	609,939	96	6,354		
	Total	1427,910	98			

a. Dependent Variable: Revenue

b. Predictors: (Constant), Size, Age

Source: Obtained from the Regression output list. Regression was performed by author.

The most important indicator of the ANOVA table is the last value – Significance (Sig.).

The significance value allows to understand if the independent variables accurately predict the dependent variable. Usually, this value is compared to the selected confidence (alpha) level, which usually, as in this particular regression is chosen as 0.05, and in rarer cases as 0.01. If this value is smaller than the alpha level, it can be concluded that the independent variables reliably predict the dependent variables. From the ANOVA table above, it can be stated that the size and age of the company reliably predict the dependent variable of company revenue, as the significance value obtained from the regression is 0,001 which is significantly less that selected alpha of 0,05. This means that size and age of the company (independent variables) have a statistically significant relationship with the revenue (dependent variable), and that these independent variables have a potential to predict the revenue.

Table 3.

Individual Coefficients of the Regression Model

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1,268	,494		2,569	,012	,288	2,248		
	Age	,062	,012	,372	4,999	<,001	,038	,087	,804	1,244
	Size	,071	,010	,515	6,919	<,001	,051	,092	,804	1,244

a. Dependent Variable: Revenue

Source: Obtained from the Regression output list. Regression was performed by author.

Table above represents the ability of each of the independent variables to forecast the dependent variable. As it can be observed on the table, both of the coefficients have statistical significance (Sig. level is less than 0.05). B value from the table represent the values for regression equation that is in turn, used to predict the dependent variable from the

independent ones. Unstandardized coefficients are measured in natural units and cannot be compared to each other for identifying the most powerful in the model, as they are calculated in different scales. From the table above, it is possible to compose the regression equation:

Revenue = 1.268 + 0.62 (age of the company) + 0.71 (Size of the company)

These values indicate the relationship between the independent variables (size or age) and the dependent variable (revenue). To be more illustrative, it can be rephrased as follows:

Holding size of the company constant constant, as age increases by 1 year, the expected change in the mean value of the company revenue is an increase by 0.062 or 6 per cent. And holding age of the company constant, a one unit change in employment leads to an increase in the mean value of the revenue by about 0,071 or 7 per cent.

An important condition that should be fulfilled by the regression is absence of collinearity problem. The last column of the coefficients table is Variance Inflation Factors (VIF), which help to determine is the model has multi-collinearity problem, indicating high correlation between the independent variables. The values of the Variance Inflation Factors values are close to the optimum value of 1. Although they exceed 1, showing some correlation, but highly insignificant one, not enough to be disturbing. The values between 5 and 10 indicate multi-collinearity problem. Overall, it is possible to conclude that regression coefficients were estimated correctly, as model does not have collinearity problem.

Table 4.

Collinearity diagnostics table as an outcome of Regression analysis.

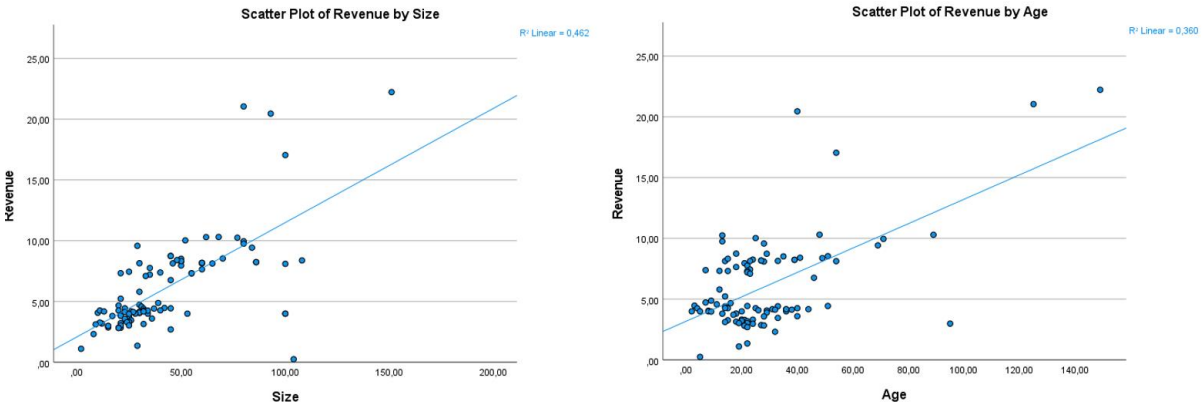
Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Age	Size
1	1	2,621	1,000	,03	,04	,03
	2	,221	3,441	,36	,90	,06
	3	,158	4,072	,61	,06	,91

a. Dependent Variable: Revenue

Source: Obtained from the Regression output list. Regression was performed by author.

The collinearity diagnostics table column Condition index is also indicating optimal value less than 30, meaning that the model does not experience any stability problems, and indicated that sample size is big enough for the factors chosen.



Graph 3. ***Scatter Plots of Revenue by Size and Age***

Source: Obtained from the Regression output list. Regression was performed by author.

The two graphs above illustratively depict the relationship between the dependent variable and each individual independent variable. It can be noticed, that the relation between size and revenue is more obvious than relationship between age and revenue.

To summarize the outcomes of the model, it can be stated that the model is statistically significant, with all partial regression coefficient also indicating a sufficient significance level. The model does not have any regression problems indicating poor choice of dataset and factors. This means that from a set of 100 German manufacturing enterprises it is possible to predict 57 per cent of variance in revenue through such factors as size and age of the company, leading to the conclusion, that ***the hypothesis of company revenue being independent from size and age is rejected for this case.***

3.2.1. Explanations of the Outcomes

While Gibrat's Law states that growth of SMEs is not related to its size or age, for the rest of the researcher's outcomes of this theory were varying depending on country, industry and time-periods. The following subchapter attempts to find out why for this particular case the hypothesis of company revenue being not connected to the size or age was rejected.

According to KfW Competitiveness Indicator, Germany was listed on top of the ranking. This survey evaluates two groups of sub-indicators of business performance, such as relation of price and quality, innovation, quality of services, cost of the raw materials and efficient use of energy. Second group of sub-indicators comprises location performance factors, for instance degree of bureaucracy, taxes and responsibilities, corruption on various levels, political and civil instability, shortage of skilled employees, infrastructure, finance and environmental protection policies. Surveyed SMEs of Germany considered bureaucracy level

as moderate, while the rest of sub-indicators not challenging or not present (Abel-Koch, 2016b)[118].

Average annual salary is similar in medium-sized companies and large enterprises, while small enterprises show lower amount of annual earnings. Despite such tendency, the work conditions and social security situation among Small and Medium-sized companies is analogous to that of the large firms. These factors are the integral components of German social market, significantly contributing to it economic and social development.

SMEs in Germany can easily get access to finance, which according to the World Bank (2008) is a crucial factor in investment promotion, additionally, strongly facilitating company's productivity and growth.

Another factor apart from those listed in previous chapters, such as high degree of innovation, competitiveness, safe balance sheet structure, there is another important characteristic affecting the results, might be the fact that German SME sector has shown a high resilience against the financial crisis. Not only this factor contributes to older companies to develop more expertise, established reputation among customers and partners, which contributes to strong uphill tendency in their revenue growth, but also explains the higher average age of the German enterprises.

Stability that is highly inherent to German enterprises is enables them to manage the external forces that are capable of disrupting the balance. This feature allows companies, in case of any turbulences to return to its initial state or utilize restoring forces[119].

Another important contributor to the stability of German SME sector is high flexibility. Flexibility implies prompt reaction and adaptation to external or internal changes, whether they already occurred or forecasted[120,121]. Given such characteristics, companies are able to maintain stable market position, ensure durability and survival of the company, through coping with various constraints, such as social instability or employee shortage.

Concerning external shocks and internal obstacles, there are not so many threats observed. Labor market continues a positive trend, with number of employed persons increasing steadily and number of unemployed falling down[122]. This fact is integrally

[118] Abel-Koch, J. (2016b); KfW Competitiveness Indicator 2016; available at: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-DokumenteWettbewerbsindikator/KfW-Wettbewerbsindikator_2016_EN.pdf

[119] Brockhaus Enzyklopädie Online, Stabilität, 2010, http://www.brockhaus-enzyklopaedie.de/be21_article.php.

[120] M. A. Hitt, B. W. Keats, and S. M. DeMarie, "Navigating in the new competitive landscape: building strategic flexibility and competitive advantage in the 21st century," Academy of Management Executive, vol. 12, no. 4, pp. 22–42, 1998.

[121] M. Saatmann and K. I. Voigt, "Begriffsbestimmung Flexibilität und Adaptivität," Arbeitspapier FlexLog, 01/2005, 2005.

[122] Federal Employment Agency of Germany, Federal Statistical office of Germany, February 2020.

connected to the increase in employed people per company, growth of productivity and thus providing explanations for higher revenue. Companies do not experience any shortage in financing, with regional bank providing high degree of support. Banks and firms in Germany have close ties, and two out of three types of banks in Germany are non-profit institutions, that actively provide loans and support to local companies and facilitates lower interest rates.

Given above factors underpin the results of regression output, namely they explain why on average German companies tend to be older with factors as stability, flexibility, access to finance, smaller pressures on companies, and how firms increase the number of employed people, which in conjunction enables companies to increase their revenues.

3.3. Effects of Size and Age on SMEs in Latvia. Interpretation of the Results

Analogous regression analysis was performed using the data on 100 manufacturing companies of Latvia. Average number of employees among the selected companies is 69.8 and average age is 17.6. Regression was performed using one model, with all variables entered to SPSS Statistical Software in usual mode. Revenue was indicated as dependent variable, while size and age as independent, in order to find whether those independent factors influence the dependent one.

Table 5.

Model Summary and Overall Model Fit (Latvia)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,526[a]	,277	,262	6,06933	1,208

a. Predictors: (Constant), Age, Size

b. Dependent Variable: Revenue

Source: Obtained from the Regression output list. Regression was performed by author.

As it can be observed from the table, R-Square of this regression or the variance proportion of the dependent variable (in this case revenue of SMEs) which might be predicted from the independent ones (size and age of the company) is 0.277, indicating that only 27.7 per cent of the variance in revenue for the dataset of Latvian companies can be predicted from variables size and age. Although the value of R-square is not high, that does not necessarily lead to the conclusion of unsuitable model, and can result in multitude of problems related to it. For a more precise conclusion about the model, ANOVA and Coefficients tables need to be analyzed.

Adjusted R-square does not differ considerably from R-square as in the case with German SMEs, since the number of predictors is not high, which eliminates the probability that some predictors contribute to explaining the variance of the dependent variable simply by chance.

Standard Error of Estimate is relatively high 6.1, higher than in the previous regression case. This may be a sign of various problems in the model, such as multi-collinearity between variables, insufficient sample size or unreliability of the model. For a more precise conclusion, further outcomes of the regression need to be analyzed for more details.

From the ANOVA Table presented below, it is possible to conclude that the model is statistically significant – the significance level indicated in the last column is 0.001 which is

smaller than selected confidence level 0.05, meaning that independent variables can statistically predict the dependent variable.

Table 5.

ANOVA Table

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1354,317	2	677,159	18,383	<,001[b]
	Residual	3536,330	96	36,837		
	Total	4890,647	98			

a. Dependent Variable: Revenue

b. Predictors: (Constant), Age, Size

Source: Obtained from the Regression output list. Regression was performed by author.

For more information on the ability of each independent variable – size or age of the company to predict the outcome on revenue – the dependent variable, the further table of coefficients needs to be examined.

Table 7.

Individual coefficient of the Regression Model

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	,816	1,441		,566	,573	-2,045	3,677		
	Size	,050	,010	,460	5,074	<,001	,031	,070	,915	1,093
	Age	,127	,075	,153	1,691	,094	-,022	,277	,915	1,093

a. Dependent Variable: Revenue

Source: Obtained from the Regression output list. Regression was performed by author.

The regression equation for this case will be expressed as following:

Revenue = 0.816 + 0.050 Size + 0,127 Age

The significance column of the table indicates that only one coefficient is statistically significant: independent coefficient size shows significance level of 0.001 is below selected confidence interval (0.05), meaning that size is the only significant coefficient of this model. The significance of the Age coefficient of the company stands at 0.94, thus considerably exceeding the critical p-value.

Subsequently, holding age constant, for every additional employer increase, a 0.050 or 5% increase in revenue is predicted.

Additionally, the model also need to be reviewed to determine if there are some problems associated to it. The first point of analysis is Variance Inflation Factors from the Coefficients table. The VIF value obtained from regression is at an optimal level, slightly exceeding 1. For the further signs of absence multi-collinearity, as an important condition of regression analysis, the Collinearity diagnostics table below should be observed.

Table 8.

Collinearity diagnostics

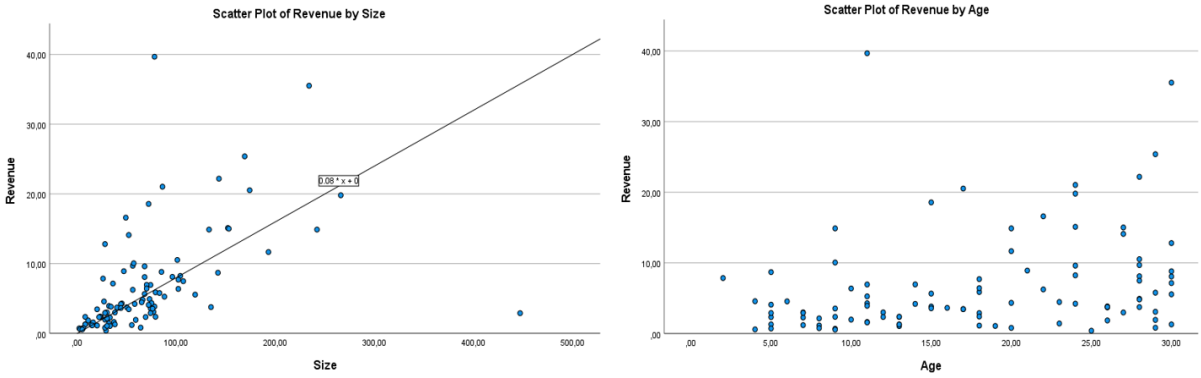
Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Size	Age
1	1	2,593	1,000	,02	,05	,02
	2	,309	2,898	,10	,95	,07
	3	,098	5,136	,88	,00	,90

a. Dependent Variable: Revenue

Source: Obtained from the Regression output list. Regression was performed by author.

Although the Eigenvalues for the 3rd dimension of the table is extremely small, which may be one sign of problem in the model. Small Eigenvalues are problematic, because they mean that the variable is not contributing anything meaningful to the data. The collinearity diagnostics table column Condition index is also indicating optimal value 5.136, which is less than 30, meaning that the model does not experience any stability problems and that sample size is big enough for the factors chosen.

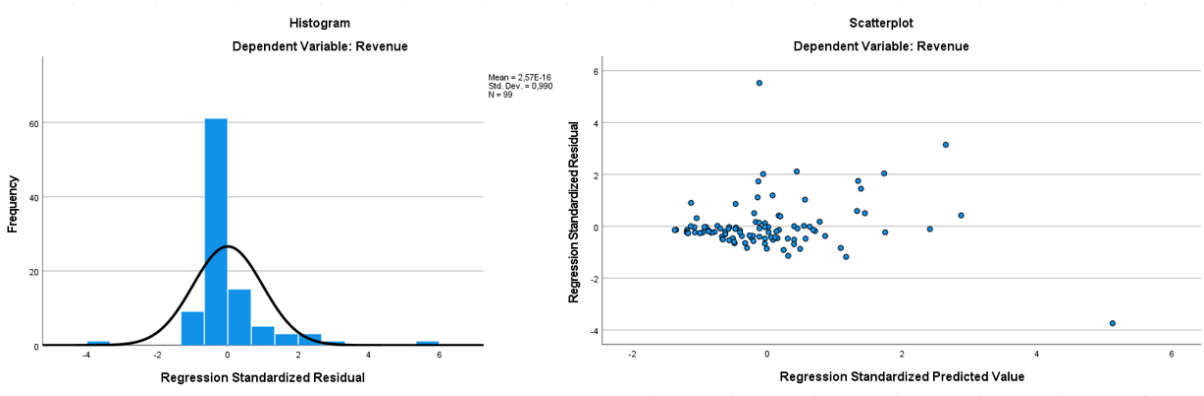


Graphs 7 and 8: ***Scatter Plots of Revenue by Size and Age***

Source: Obtained from the Regression output list. Regression was performed by author.

The scatter plots display the relationship between revenue and each of the dependent variables – size and age of the company. While the first graph depicting relationship between revenue and size shows a particular trend, the second graph illustrating relationship between revenue and age does not tend to have any informative pattern.

The more informative pattern can be gained through residual plot pattern or histogram, especially given a sample size of 100 cases histogram can be informative source on tendencies. Ideally, residual plot should be normally distributed – a symmetrical pattern, with all dots placed close to 0 on the Y-axis, close to the middle of the plot. In addition, all values should be distributed within one digit small values on X and Y axis and not form any visible pattern, meaning that they should be distributed randomly.



Graph 7 and 8. ***Standardized Residual Histogram and Standardized Residual versus Standardized Predicted Values Scatter Plot.***

Source: Obtained from the Regression output list. Regression was performed by author.

The histogram above indicates skewness of the distribution to the left side and long right hand-side tail, which is typical for lognormal distribution. Secondly, the scatter plot, which depict predicted revenue values on horizontal axis and standardized residual on vertical axis, in case of normal distribution of residuals, would have its values distributed around the value [-2;+2] on both horizontal and vertical axis. For this regression the scatter plot has some obvious outliers both for standardized residual and standardized predicted values. Additionally, the points on the graph tend to cluster towards the middle in the left hand side of the plot, and distributed more sparsely on the right hand side, which might be a sign of heteroscedasticity. Heteroscedasticity may not cause a considerable bias in coefficient values, however, it can make them less precise, not correspondent to the population value.

In spite of the fact that model is statistically significant, collinearity problem is not present in this model, as well there is not enough evidence of an insufficient sample size, the model is still not fully reliable, due to the fact that it has lower variance proportion of the dependent variable (revenue) which might be explained by independent ones (size and age), high standard error, only one statistically significant coefficient and a very low eigenvalue. This evidence lead to the conclusion, that ***the hypothesis of revenue being completely independent from the size and age of the company cannot be rejected for this case***.

3.3.1. Explanations of the Outcomes

Since the hypothesis of revenue being an independent variable from size and age was not rejected for the Latvian case as a result of statistical analysis, the following sub-chapter aims to explain the conclusion of such results and support them with additional external factors. There are many possible explanations of insufficiency of the model, among which are unique economic conditions of each country, various policies and legislations that have a decisive impact on business in the country, FDI levels, difference in minimum efficient scale (MES), the generally smaller threshold of size and age that trigger company effectiveness and different ways of development. All the factors are inherent to thee system, country and industry. Apart from this, it is also possible that the dataset did not fit the model – the predictors selected might have no particular power.

Latvian enterprises are in general younger than German enterprises, which may be one of the reasons that revenue was not related to age of the company. The reason for that might also be external factors, financial crisis of 2008 and the fact that Latvia regained its independence in 1991, thus affecting the minimum efficient scale for possibly may sectors.

2008-Financial crisis might have affected SME sector through access to finance. For instance, foreign direct investment decreased to 0.57 per cent of GDP in 2009[123], and throughout the years 2010-2018 still did not reach its pre-crisis level.

In addition, the amount of loans provided by banks to various sectors of economy has also seen a relatively sharp decrease in the years 200-2014. Concerning individual enterprises, majority of micro companies (63 per cent and Small and 49 per cent Medium-sized Enterprises) tend not to apply for loans and are not interested in receiving such[124].

Another obstacle for the research as well as for the growth of foreign investments is the presence of the shadow economy, namely unreported personal spending and business spending. According to Associate professor at SSE Riga Arnis Sauka, the shadow economy was increasing since 2016, which author of Shadow Economy Index considers as a negative sign. According to him, the reduction of the proportion of the shadow economy will be more complicated during the expected economic decline between 2020-2022, where the Professor forecasts an increase in shadow economy indicators. A shadow Economy Index indicates 23.9 per cent of GDP in Latvia in 2019, compared to the neighboring Lithuania and Estonia 18.2 and 14.3 per cent respectively. Out of that amount, unreported wages in Latvia accounted for

[123] World Bank Foreign Direct Investment in Latvia, Net Inflows, (% of GDP) https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS?locations=LV

[124] Latvia Competitiveness Report 2015 Executive Summary Riga. Certus Think Tank. 2015. ISBN 978-9934-8558-2-5

22.3 per cent, unreported income amounted at 16.6 per cent and illegal employees made up 10.9 per cent of the Latvian shadow economy. Sector analysis indicated that construction sector generates the highest share of the shadow economy in Latvia, flowed by trade, service and manufacturing sectors[125]. Entrepreneurs typically tend to be involved in shadow economy activities due to various factors, such as frustration with State Revenue Service, business legislation, support for entrepreneurs and tax policies.

In addition, another challenge that entrepreneurs and investors encounter is corruption perception and public briery. Latvia ranks 44th in Transparency international report 2019[126]. The Latvian Branch of Transparency International, DELNA, is actively promoting elimination of corruption and upgrading of governmental processes. Government is highly facilitation elimination of corruption with establishment of such as KNAB, there is still a lot of room for improvement and enforcement.

Latvia is continuously improving its business environment, adopting policies of sustainable development and actively reducing informal economy.

Businesses in Latvia are highly concerned about shortage of highly-qualified labor. Latvia has encountered a severe problem of emigration and brain drain. IMF published a report on Emigration and its Economic Impact on Eastern Europe, according to which In Latvia, 40 per cent of emigrants had highly specialized education, while the national average of people having the same level of education amounted only at 20 per cent[127]. Shortage of qualified workers might be a contributor to the results of the model, while the coefficient was significant, increase in persons employed did not contribute much to the outcomes in revenue.

Overall, Latvian economy develops, as well as its individual sectors, meaning that there are multiple factors positively influencing the development of the SME sector, such as tax policies, increased value added and growing FDI levels. In June 2020, Latvian accumulated FDI amounted EUR 16.2 billion making it more than half (55 per cent) of GDP, growing 6.5 per cent compared to the previous year. However, the most important factor in development of Latvian economy and SME sector in particular, is a productivity growth, which continues a positive trend over the last three years (+2.7 per cent)[128].

[125] Shadow Economy Index for the Baltic Countries, SSE Riga https://www.sseriga.edu/shadow-economy-index-baltic-countries
[126] Corruption Perceptions Index 2019, Transparency International https://www.transparency.org/en/cpi/2019/index/nzl
[127] Emigration and Its Economic Impact on Eastern Europe https://www.imf.org/external/pubs/ft/sdn/2016/sdn1607.pdf
[128] Ministry of Economics of the Republic of Latvia, Central Statistical Bureau, 2020 "Macroeconomic Review of Latvia", ISSN 2592-8538

CONCLUSIONS

After careful observation of factors of growth of Small and Medium-sized Enterprises in Germany and Latvia and implementation of regression analysis, it is possible to conclude following ideas:

1. The Law of Gibrat, stating that the growth of the company is not related to company's size or age, performs differently for various countries, time periods and industries.
2. For the selected sample size of manufacturing SMEs in Germany, hypothesis of revenue being not correlated with size and age was rejected, with statistical analysis results indicating that up to 57 per cent of the variance in revenue can be predicted by combination of these variables.
3. Both of the independent variables size and age indicated statistical significance, which allows to draw conclusions and develop the model further.
4. Among the reasons, facilitating the hypothesis rejection for Germany the most important are high vitality and stability, flexibility and highly-qualified employees.
5. For the selected sample of Latvian manufacturing SMEs, hypothesis of revenue being not correlated with size and age was not rejected. One of the factors – age, has proven to be statistically insignificant, as well as the model itself has proven to be not fully reliable.
6. The hypothesis could not be rejected due to presence of various external and internal reasons and conditions. They might be negative, such as possible presence of shadow economy and depopulation, or positive, such as government assistance, investments and increasing value added.
7. Clearly size and age are not the only contributors of company growth, and each country has a different combination of factors influencing SME development, from political, financial stability, tax policies, insolvency legislation, financing, fair competition etc.
8. Since each country has a unique economic and political environment, it is difficult to specify "general" factors of SME growth, and each country should be examined individually.

PROPOSALS

For a further quantitative analysis on the issue of SME growth in order to achieve more precise results and use the estimates consequently for predictions, it is possible to propose following aspects to researchers:

1. For a better observation of tendencies, a larger sample size of 300 companies is recommended.
2. For a larger and highly-precise sample size it is strongly recommended to cooperate with state agencies, operating datasets on various factors of business development and data on individual companies.
3. The research was conducted for two countries, and result were contradicting to each other. It might be useful to consider another country's SME sector for a quantitative analysis (e.g. Estonia), for a better comparison of results, facilitating factors and drawing respectable conclusions.
4. For a more extensive research, also in case if the model presented here will not work for some countries, further factors, that can be estimated quantitatively (e.g. amount in loans received, R&D expenditure, resources, etc.) can be included to the model.
5. The analysis can be conducted along all sectors of SME, not only manufacturing sector, however, it is highly recommended to use manufacturing company, as they are significant contributors to account balance.

LITERATURE AND SOURCES

1. Abelhauser, W. 2003. „Kulturkampf: Der deutsche Weg in die neue Wirtschaft und die amerikanische Herausforderung.“ Berlin: Kulturverlag Kadmos.
2. Abel-Koch, J., del Bufalo, G., Fernandez, M., Gerstenberger, J., Lo, W., Navarro, B., Thornary, B. (2015); SME investment and innovation: France, Germany, Italy and Spain, in KfW Group; available at: https://www.kfw.de/PDF/DownloadCenter/Konzernthemen/Research/PDF-Dokumente-Studien-undMaterialien/SME-Investment-and-Innovation-October-2015.pdf
3. Audretsch, D. B., 1995. “Innovation, growth and survival”. International Journal of Industrial Organization, 73(4), 441-457.
4. Audretsch, D. B. and Elston J. A., 2002. “Does firm size matter? Evidence on the impact of liquidity constraints on firm investment behavior in Germany”. International Journal of Industrial Organization, 20 (1), 1-17.
5. Audretsch, D. B., & Elston, J. A.,2010. “On the relationship between firm size and growth: Have we been asking the wrong questions?” Working paper presented at the Ratio Colloquium for Young Social Scientists, Stokholm
6. Arrighetti, A., & Vivarelli, M., 1999. “The role of innovation in the postentry performance of new small firms: Evidence from Italy”. Southern Economic Journal, 65, 927-940
7. Baum, C. F., Caglayan, M. and Talavera, O., 2008, ‘Uncertainty determinants of firm investment’, Economics Letters 98(3), 282–287.
8. Becchetti, L. and Trovato, G., 2002. “The determinants of growth for small and medium sized firms: the role of the availability of external finance”. Small Business Economics, 19 (4), 291-306.
9. Bernhardt, T., Pollak, R., 2015. “Economic and Social Upgrading Dynamics in Global Manufacturing Value Chains: A Comparative Analysis, FIW Working Paper, No. 150, FIW - Research Centre International Economics, Vienna
10. Berry, A., 2007. “The Importance of SMEs in the Economy”, ITD Global Conference on Taxation of Small and Medium Enterprises, Buenos Aires, Argentina, 17-19 October 2007
11. Bottazzi, G., Coad, A., Jacoby, N., & Secchi, A., 2005. “Corporate growth and industrial dynamics: Evidence from French Manufacturing”. Pisa, Sant’Anna School of Advanced Studies, LEM Working Paper Series 2005/21.
12. Bottazzi, G., Dosi, G., Lippi, M., Pammolli, F., & Riccaboni, M., 2001. “Innovation and corporate growth in the evolution of the drug industry”. International Journal of Industrial Organization, 79(7), 1161-1187.
13. Bottazzi, G., & Secchi, A., 2005. “Growth and diversification patterns of the worldwide pharmaceutical industry”. Review of Industrial Organization, 26(2), 195-216.
14. Bottazzi, G., & Secchi, A., 2006. “Gibrat’s law and diversification”. Industrial and Corporate Change, 75, 847-8
15. Brockhaus Enzyklopädie Online, Stabilität, 2010, http://www.brockhaus-enzyklopaedie.de/be21_article.php.

16. Cagliano, R. K. and Spina, G., 2002. “A comparison of practice-performance models between small Manufacturers and subcontractors”. International Journal of Operations and Production Management, 22
17. Carbon Trust, 2013. “Low carbon entrepreneurs: The new engines of growth”, https://www.carbontrust.com/resources/reports/technology/low-carbon-entrepreneurs/.
18. Certus Think Tank, 2015. “Latvia Competitiveness Report Executive Summary” ISBN 978-9934-8558-2-5
19. Coad, A. (2007). Empirical investigations into the characteris- tics and determinants of the growth of firms. Doctorat Sciences Economiques, Université Paris 1
20. Daunfeldt, S. and Elert, N. 2011 “When is Gibrat's law a law?” Source: Small Business Economics, June 2013, Vol. 41, No. 1 (June 2013), pp. 133-147, Published by: Springer, Stable URL: https://www.jstor.org/stable/43553703
21. Day, J., 2000. “Commentary-The Value and Importance of The Small Firm to The World Economy”, European Journal of Marketing, Vol.34, Issue:9/10, pp.1033-1037.
22. Druker,2009. Innovation and Entrepreneurship, New York: Harper Collins.
23. Elston, J. A., and Audretsch, D. B., 2011. “Financing the entrepreneurial decision: An empirical approach using experimental data on risk attitudes”. Small Business Economics, 36
24. Ericson, R. and Pakes, A., 1995. “Markov-Perfect Industry Dynamics: A Framework for Empirical Work”. Review of Economic Studies, 62, 53-82.
25. ETLA, 2015. From Cleantech to Cleanweb. The Finnish Cleantech Space in Transition, ETLA Paper No 43, ETLA – The Research Institute of the Finnish Economy, https://www.etla.fi/wpcontent/uploads/ETLA Raportit-Reports-43.pdf.
26. European Commission, 2003. “The New SME Definition User Guide and Model Declaration”, Enterprise and Industry Publication, [available at ec.europa.eu/enterprise/enterprise_policy/sme_definition/sme_user_guide.pdf].
27. European Commission, 2019 SBA Fact Sheet, “SME Performance Review Germany”, Brussels, 2019.
28. European Commission, 2019 SBA Fact Sheet, “SME Performance Review Latvia”
29. Eurostat, 2014. Patent Statistics at Eurostat. « Mapping the contribution of SMEs in EU patenting.” Eurostat Manuals and Guidelines, Luxembourg, http://ec.europa.eu/eurostat/documents/3859598/6064260/KS-GQ 14-009-EN-N.pdf/caa6f467-11f8- 43f9-ba76-eb3ccb6fab6d.
30. Evans, D. S., 1987. “The relationship between firm growth, size and age: estimates for 100 manufacturing industries”. The Journal of Industrial Economics, 35 (4), 567-581
31. Fotopoulos, G. and Giotopoulos, I., 2010. “Gibrat’s Law and Persistence of Growth in Greek Manufacturing”. Small Business Economics, 35, 191-202.
32. Freel, M. S., 2000. “Do small innovating firms outperform non- innovators?”. Small Business Economics, 14(3), 195-210
33. Geroski, P. A., & Machin, S., 1992. „Do innovating firms outperform non-innovators?” Business Strategy Review, 3(2), 79-90.
34. Geroski, P. A., & Toker, S., 1996. „The turnover of market leaders in UK manufacturing industry, 1979-86”. International Journal of Industrial Organization, 14(2), 14

35. Grinfelds, T., 2019. “Mechanical engineering and metalworking sector in Latvia Trends, prospects, challenges”, Chairman of the Board MASOC Tech Industry 2019, Association of Mechanical Engineering and Metalworking Industries of Latvia
36. Guttler, C., 2001. “Improving Competitiveness of SMEs in Developing Countries, in Improving The Competitiveness Of SMEs In Developing Countries: The Role Of Finance To Enhance Enterprise Development”, UNCTAD, NewYork & Geneva.
37. Hall, G., Hutchinson, P. and Michaelas, N., 2000. “Industry Effects on the Determinants of Unquoted SMEs’ Capital Structure”. International Journal of the Economics of Business, 7 (3), 297-312
38. Herr, H., Nettekoven, Z., 2018. “The role of small and medium-sized enterprises in development: What can be learned from the German experience?” Global Labour University Working Paper, No. 53 ISSN: 1866-0541 (print); 2194-7465 (PDF)
39. Heshmati, A. 2001. “On the growth of micro and small firms: evidence from Sweden”. Small Business Economics, 17 (3), 213-228.
40. Hitt, M., Keats B., and DeMarie, S., 1998 “Navigating in the new competitive landscape: building strategic flexibility and competitive advantage in the 21st century,” Academy of Management Executive, vol. 12, no. 4, pp. 22–42, 1998.
41. IBRD, 2014. “Building competitive green industries: the climate and technology opportunity for developing countries”, International Bank for Reconstruction and Development/The World Bank, Washington D.C.
42. IFAC, 2018. Foundation for Economies Worldwide=Small Business. https://www.ifac.org/global knowledge-gateway/finance-leadership-development/discussion/foundation-economies-worldwide.
43. Internal Market, Industry, Entrepreneurship and SMEs, European Commission, Web-page https://ec.europa.eu/growth/smes_en
44. Johnson, P., Conway, C., & Kattuman, P., 1999. “ Small business growth in the short run”. Small Business Economics, 12(2), 103-112
45. Johnson, Simon, John McMillan, and Christopher Woodruff. 2002. "Property Rights and Finance ." American Economic Review, 92 (5): 1335-1356.
46. Kan, K., and Tsai, W. D., 2006. “Entrepreneurship and risk aversion”. Small Business Economics, 26, 465-474.
47. Keskin, H., et al, 2010. “The Importance of SMEs in Developing Economies” 2nd International Symposium on Sustainable Development, June 8-9 2010, Sarajevo
48. Khan, M.A.; Qin X. and Jebran K. 2020 “The Sensitivity of Firms’ Investment to Uncertainty and Cash Flow: Evidence From Listed State-Owned Enterprises and Non-State-Owned Enterprises in China” School of Business Administration, Dongbei University of Finance and Economics, Dalian, P.R. China, First Published January 29, 2020 Research Article https://doi.org/10.1177/2158244020903433
49. Langenscheidt, F., Venohr, B., 2015. “The Best of German Mittelstand – The World Market Leaders” (Ed.) Cologne: Deutsche Standards EDITIONEN, 1st edition, ISBN 978- 3-942597-48-7
50. Lotti, F., Santarelli, E., & Vivarelli, M., 2009. ”Defending Gibrat's law as a long-run regularity”. Small Business Economics, 32, 31-44.
51. Ministry of Economics of the Republic of Latvia, Central Statistical Bureau, 2020 “Macroeconomic Review of Latvia”, ISSN 2592-8538

52. Morone, P. and Testa, G., 2008. “Firms’ growth, size and innovation – an investigation into the Italian manufacturing sector”. Economics of Innovation and New Technology, 17 (4), 311-329.
53. Moscarini, G., Postel-Vinay, F. 2012. “The Contribution of Large and Small Employers to Job Creation in Times of High and Low Unemployment.” American Economic Review, 102(6), p.2509-39.
54. Neagu, C., 2016. “The importance and role of small and medium-sized businesses.” Theoretical and Applied Economics Volume XXIII (2016), No. 3(608), Autumn, p. 331-338.
55. OECD 2013b, Skills Development and Training in SMEs, OECD Publishing, Paris http://dx.doi.org/10.1787/9789264169425-en
56. OECD Economic Surveys: Germany 2018 “German SMEs engage more in incremental innovation: 2012-14” Version 2 – Last updated Jun 1, 2018 DOI:https://doi.org/10.1787/eco_surveys-deu-2018-graph56-en
57. OECD 2015a, Policy Framework for Investment 2015 Edition, OECD Publishing, Paris.
58. OECD 2016a, The Productivity-Inclusiveness Nexus, Meeting of the OECD Council at Ministerial Level, Paris, 1-2 June 2016 [C/MIN(2016)3].
59. OECD 2016e, Job creation and local economic development, OECD Publishing, Paris.
60. OECD 2017a, Small, Medium, Strong. Trends in SME Performance and Business Conditions, OECD Publishing, Paris.
61. OECD 2017b, Increasing productivity in small traditional enterprises: programmes for upgrading management skills and practices, OECD Working Party on SMEs and Entrepreneurship, CFE/SME(2016)6.
62. OECD 2017c, Entrepreneurship at a Glance 2017, OECD Publishing, Paris, forthcoming.
63. OECD 2017d, “Mapping SME Participation in Global Value chains in ASEAN”, OECD Working Party of the Trade Committee, TAD/TC/WP(2015)25/REV2/PART2.
64. OECD (2019), OECD SME and Entrepreneurship Outlook 2019, OECD Publishing, Paris, https://doi.org/10.1787/34907e9c-en.
65. Parella, J.F, Carmona, G., «The German Business Model: The Role of Mittelstand”, Journal of Management Policies and Practices June 2018, Vol. 6, No. 1, pp. 10-16 ISSN: 2333-6048 (Print), 2333-6056 (Online), Article · August 2018 DOI: 10.15640/jmpp.v6n1a3
66. Raymond, L., Bergeron, F. and Blili, S., 2005. “The assimilation of E-business in manufacturing SMEs: determinants and effects on growth and internationalization”. Electronic Markets, 15 (2), 106-118.
67. Rizhamadze, K., 2018. “Innovation as Pathway to Business Growth of SMEs in Latvia”, Conference Paper, April
68. Roper, S., 1997. “Product innovation and small business growth: A comparison of the strategies of German, UK and Irish companies”. Small Business Economics, 9(6).
69. Saatmann, M., and Voigt, K., 2005. “Begriffsbestimmung Flexibilität und Adaptivität,” Arbeitspapier FlexLog, 01/2005.
70. Sarwoko, E., Frisdiantara, C., (2016). Growth Determinants of Small Medium Enterprises (SMEs). Universal Journal of Management, 4(1), 36 - 41.

71. Scherman, R., and Willet, T.D., 1967. “Potential entrants discourage entry”. Journal of Political Economy, 75, 400-403.
72. Simon, H. 2007. Hidden Champions des 21. Jahrhunderts: Die Erfolgsstrategien unbekannter Weltmarktführer. Frankfurt/New York: Springer Verlag.
73. Strategy 2013. ‘The Global Innovation 1000: Comparison of R&D Spending by Regions and Industries,’ [online at http://www.strategyand.pwc.com/global/home/what-we-think/global-innovation-1000/rd-intensity-vs-spend-2013-v2stage]
74. Strotman, H., 2007. “Entrepreneurial Survival”. Small Business Economics, 28(1), 87-104.
75. Teruel-Carrizosa, M., 2010. “Gibrat’s law and the learning process. Small Business Economics, 34(4), 355-373.
76. USITC, 2014. Trade Barriers That U.S. Small and Medium-sized Enterprises Perceive as Affecting Exports to the European Union, United States International Trade Commission, Investigation No. 332-541, March 2014, https://www.usitc.gov/publications/332/pub4455.pdf.
77. Warner, A., 2001. “Small and Medium Sized Enterprises and Economic Creativity, in Improving The Competitiveness Of SMEs In Developing Countries: The Role Of Finance To Enhance Enterprise Development, UNCTAD, NewYork & Geneva.
78. Weiss, C. (998. “Size, growth and survival in the upper Austrian farm sector”. Small Business Economics, 10(4), 305-312.
79. Wissenschaftsstatistik 2012. „FuE-Datenreport 2012 – Analysen und Vergleiche.“ Essen: Wissenschaftsstatistik GmbH, [online at http://www.stifterverband.info/statistik_und_analysen/wissenschaftsstatistik/publikationen/fue_datenreport/fue_datenreport_2013_analysen_und_vergleiche.pdf]
80. Xhepa, S., 2006. “Competitiveness And The SME Development In Albania”, The Institute for Contemporary Studies (ISB), Tirana, [available at http://www.western-balkans.info/upload/docs/1___Albania_SMEnew.pdf].

ANNEXES

Database of German Companies:

Company	Size	Created	Turnover	Age
procontour möbel GmbH & Co. KG	50	1997	8.26	24
Erich Scheerer GmbH	86	1982	8.24	39
ZIEGLER Spielplätze von A bis Z Freizeitanlagen e.K.	60	1994	8.18	27
wipfler fenster+fassaden gmbh	60	2007	8.14	14
Falkner & Kopp GmbH	50	2000	7.96	21
Lorenz GmbH	21	2000	2.84	21
Pfälzer Kapsel- und Korkfabrikation (KKP) GmbH.	15	1994	2.87	27
Trotec Laser Automation GmbH	37	1988	4.42	33
Sigma Surface Science GmbH	30	2013	4.05	8
GuKoTech Gmb	30	2009	5.8	12
Kabeltrommelwerk Schuchert Inh. Birgit Schuchert e.K.	21	2007	5.23	14
ZARELO GmbH	39	2012	4.88	9
Alexander Stein GmbH	30	2014	4.73	7
Biomassehof Wonneberger GmbH	20	2005	4.67	16
Kabeltrommelwerk Vacha GmbH	31	2010	4.58	11
Highland Stall & Weide GmbH	23	1999	4.44	22
Köhler Kunsthandwerk GmbH & Co. KG	42	2018	4.47	3
effect Bilderrahmen GmbH & Co. KG	45	1970	4.44	51
Robert Richter GmbH	32	2007	4.41	14
Korkindustrie Trier GmbH & Co. KG	20	1981	4.26	40
Holzwaren Simundt GmbH	32	1996	4.26	25
Himmelsbach Leitern- & Gerüstefabrik GmbH	30	1985	4.16	36
Braun und Würfele GmbH & Co.	30	1995	4.09	26
Holz Blömer GmbH	10	1992	4.07	29
Holz Aktiv Haus GmbH	34	2001	4	20
Holzwerk Kübler GmbH	21	1992	3.9	29
Holzwerk Behringen GmbH	21	2003	3.82	18
Peter Degen	25	2004	3.72	17
Aab Bilderrahmen GmbH + Co. KG	17	2008	3.81	13
Gastrock-Stöcke GmbH	36	1981	3.6	40
Holz-Botzem & mabo-Türen GmbH	26	1988	3.46	33
Bönninghoff GmbH	25	2001	3.33	20
Roeren Holzdienstleistungsgesellschaft mbH	25	1997	3.32	24
Holzwerke Strunz GmbH & Co. KG	32	2003	3.15	18
Karsten Schröder	15	1997	2.98	24
ECH Elektrochemie Halle GmbH	23	1993	3.58	28
LABiTec LAbor BioMedical Technologies GmbH	24	2000	3.3	21
Metrus GmbH	21	2001	3.22	20
Quantum Analysis GmbH	12	1999	3.19	22
SGS Geniesser Service GmbH & Co. KG	45	2003	8.75	18

Hefefabrik Giegold GmbH	45	1992	8.74	29
Seubert Feinkostmanufaktur GmbH & Co. KG	70	1970	8.54	51
Rossini Gastronomie GmbH	50	1986	8.52	35
Heide-Werkstätten e.V.	108	1972	8.38	49
Ergüllü GmbH	50	2006	8.33	15
Reinhard Berres GmbH	30	1988	8.15	33
Querbeet Bio Frischvermarktungs-GmbH	100	1993	8.1	28
Honig Reinmuth Heinrich Reinmuth GmbH & Co.	15	1926	2.99	95
Johann Göken Honigversand GmbH & Co. KG	21	2002	3.03	19
Feinkost Reuter GmbH	25	1999	3.03	22
TOSENO GmbH u. Co. KG	20	1993	2.84	28
Mügelner Speiseservice e.Kfr.	20	2000	2.82	21
MVF-Lebensmittel-GmbH	45	1999	2.7	22
Pokébay GmbH	34	2017	4.25	4
Roggenkamp Organics AG	11	2006	4.26	15
Freiburger Frischwaren GmbH	26	1977	4.18	44
Jouis Nour GmbH	40	2007	4.27	14
Trofema AG	53	2013	4	8
Brandenburger Gemüsekontor GmbH & Co.KG	100	2016	4	5
OWICA Handels- & Produktionsgesellschaft mbH	100	1985	4	36
Wackelpeter Frischküche GmbH & Co. KG	28	2019	4	2
Wilms GmbH	13	1985	4.18	36
Ammann OHG	32	1990	4.18	31
Josef Zeppenfeld GmbH	23	1983	4.14	38
Decker Holz GmbH	27	1989	4.14	32
Erich Scheerer GmbH	86	1982	8.24	39
ZIEGLER Spielplätze von A bis Z Freizeitanlagen e.K.	60	1994	8.18	27
Keskin Fensterbau GmbH	46	1998	8.14	23
Erwin Gronemeier GmbH u.~Co KG	65	1967	8.13	54
Ferdinand Maag GmbH & Co. KG	35	1999	7.76	22
Fendt-Holzgestaltung KG	60	2003	7.65	18
HBB Holzbearbeitung Bralitz GmbH	25	1998	7.45	23
Kiefern Bohm GmbH & Co. KG	40	2014	7.39	7
Thomas Spahn Holzwerkstoffe e.K.	21	2009	7.33	12
Röwert Fenster & Tür GmbH	55	1999	7.32	22
Alber Treppensysteme GmbH	55	2006	7.32	15
Saréco Deutschland GmbH	35	1999	7.21	22
Magnat Bauelemente GmbH	33	1998	7.1	23
haacon hebetechnik gmbh	151	1872	22.23	149
Dr. Becher GmbH	80	1896	21.05	125
Lysoform Dr. Hans Rosemann GmbH	93	1981	20.46	40
Mipri GmbH	2	2002	1.11	19
Paul Voormann GmbH	45	1975	6.76	46
Plochina Chemie Weiß GmbH	8	1989	2.32	32
REINEX GmbH & Co. KG	100	1967	17.05	54
Seeger Wasch- und Reinigungsmittel GmbH	25	2012	3.98	9
SoProNem Greven GmbH	104	2016	0.25	5
Spinnrad GmbH	11	2006	3.27	15

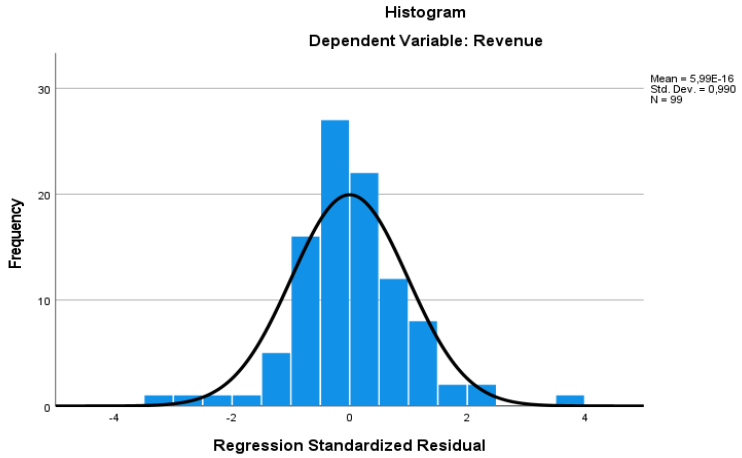
VEPACK GmbH	29	1999	1.36	22
Van Dam Bodegraven b. v.	62	1932	10.3	89
Wepos Chemie GmbH	9	2007	3.12	14
Glaswerke Wolff + Meier GmbH & Co. KG	68	1973	10.31	48
Flachglas Nord-Ost GmbH	77	2008	10.25	13
Mirotec Glas- und Metallbau GmbH	52	1996	10.03	25
Glas-Keil GmbH & Co KG	80	1950	9.96	71
DBW-Fiber-Neuhaus GmbH	80	2008	9.76	13
K M Spezialglas und Baumontagen GmbH	29	1993	9.58	28
Lutz Packaging GmbH	84	1952	9.43	69
Schaumann GmbH	48	1980	8.41	41

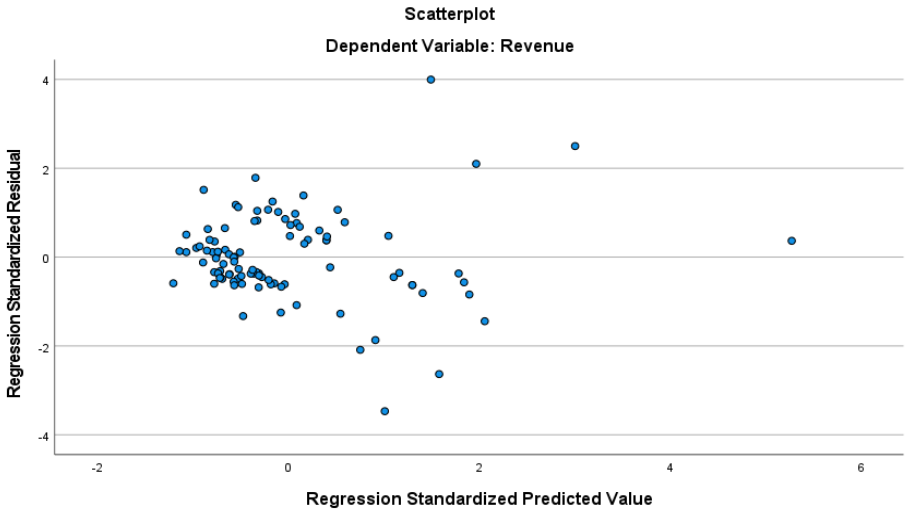
Additional Outcomes of Regression Analysis (German SMEs):

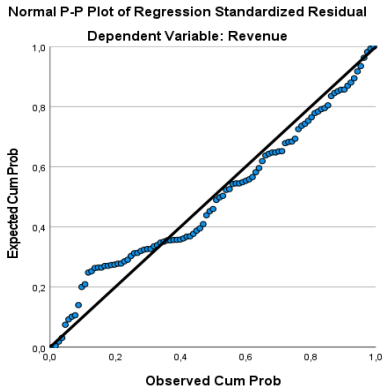
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2,5929	21,3036	6,0663	2,88906	99
Residual	-8,74190	10,07396	,00000	2,49477	99
Std. Predicted Value	-1,202	5,274	,000	1,000	99
Std. Residual	-3,468	3,997	,000	,990	99

a. Dependent Variable: Revenue







Database of Latvian Companies:

Company	Size	Created	Turnover	Age
LARTA 1 SIA	29	1996	0.4	25
Latvijas Piens SIA	78	2010	39.68	11
Valmieras piens	234	1991	35.52	30
SMILTENES PIENS AS	143	1993	22.19	28
Jaunpils pienotava AS	152	1997	15.11	24
Cesvaines Piens AS	153	1994	15.02	27
Latgales piens AS	193	2001	11.67	20
Talsu Piensaimnieks AS	101	1993	10.53	28
LIMBAZU SIERS JSC	56	1993	9.7	28
STRAUPE KS	96	1993	8.11	28
Kraslavas piens	68	1991	8.08	30
Serenes piens SIA	26	2019	7.86	2
LAZDONAS PIENSAIMNIEKS	107	1993	7.49	28
RANKAS PIENS	73	1993	4.92	28
Lat Eko Food SIA	45	2010	4.29	11
ELPA SIA	50	1993	3.75	28
Rujienas saldejums	38	2009	3	12
SALTUMS 2 SIA	29	1994	2.99	27
Baltic Dairy Board SIA	24	2008	2.36	13

Top Food SIA	33	2014	2.28	7
DUNDAGA KS	59	1992	1.94	29
SP FOODS SIA	14	2016	1.3	5
ZIEGLERA MASINBUVE SIA	266	1997	19.81	24
HQ CHIPPER PARTS SIA	32	2010	3.93	11
T.I.G.E.R. SIA	58	1997	4.23	24
BELWOOD SIA	49	1999	16.6	22
PALLOGS SIA	242	2001	14.89	20
MARKO KEA SIA	68	1997	9.62	24
DLLA SIA	104	1997	8.25	24
AG PALETES	27	2017	4.58	4
BAIBINA SIA	78	1995	3.85	26
LarixWood SIA	34	2006	3.83	15
UPESLICI SIA	40	1995	3.71	26
USI SIA	77	1992	3.09	29
BALTPAL SIA	30	2014	3	7
SIA LION BALTIC	28	2014	2.93	7
V 55 SIA	447	2003	2.9	18
VET-V SIA	23	2003	2.41	18
MnogoLat SIA	79	2008	2.38	13
BIOCORE Ltd SIA	69	2009	2.35	12
Latvia Packing SIA	22	2016	2.33	5
VOLVIT SIA	28	2011	1.98	10
JURMALNIEKI AI	11	1995	1.86	26
Juniperus SIA	37	2010	1.63	11
PalWood SIA	16	2010	1.58	11
SIMRA SIA	32	1998	1.43	23
W.P.I. SIA	8	2008	1.29	13
ZILVAS KOKS	20	2003	1.13	18
AB TERASES SIA	33	2008	1.06	13
LRS MUSA SIA	28	1991	12.81	30
Rigas kombinetas lopbaribas rupnica	85	1991	8.82	30
TUKUMA STRAUME AS	36	1991	7.15	30
BELKOVIT SIA	8	2012	2.37	9
DAUGULIS & PARTNERI SIA	75	2001	4.35	20
BALTAS NAKTIS SIA	135	1995	3.77	26
VAFELITE SIA	38	1991	1.3	30
Prima Foods SIA	15	2013	1.15	8
SIGULDAS MAIZNIEKS	28	2001	0.806	20
Aizkraukles Saldumi SIA	65	2015	4.56	6
Pure Chocolate SIA	44	2007	4.2	14
Skriveru saldumi SIA	74	2006	3.58	15
SALDUS PARTIKAS KOMBINATS	64	1992	0.826	29
Chocolette Confectionary SIA	74	2016	2.91	5
Latsweets SIA	55	2014	1.2	7
Troja SIA	169	1992	25.39	29
Baltic Block SIA	86	1997	21.04	24
WOODPRO SIA	133	2012	14.89	9
Latvani SIA	52	1994	14.11	27

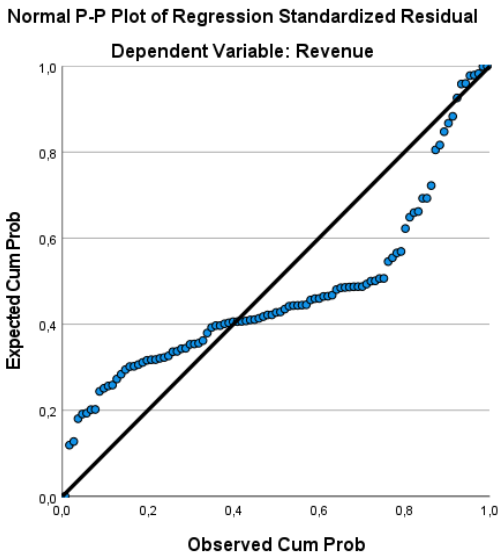
Cross Timber Systems SIA	57	2012	10.06	9
Pavasars Housing Construction SIA	142	2016	8.7	5
LATLAFT SIA	74	2010	6.95	11
ARBO Windows SIA	102	2011	6.38	10
LatIgMa SIA	79	2003	5.89	18
GAIZINS KS	83	1992	5.79	29
Nordic Homes SIA	88	2010	5.27	11
HUSVIK SIA	68	2006	5.66	15
LATEKSS SIA	119	1991	5.56	30
LIVAS GRUPA	66	1993	4.83	28
GBM SIA	72	2016	4.09	5
WWL Houses SIA	44	2005	3.64	16
Nordplay SIA	76	2012	3.55	9
DORES FABRIKA SIA	52	2004	3.46	17
LATVIAN PORT	20	2004	3.46	17
GroGlass SIA	174	2004	20.53	17
Culimeta Baltics SIA	72	2006	18.57	15
Stiklu centrs SIA	47	2000	8.92	21
PADTEX INSULATION SIA	102	2003	7.71	18
Glaskon SIA	70	2007	6.96	14
TRANSPARENCE SIA	70	2003	6.43	18
ALTEHS SIA	56	1999	6.25	22
GLAZERI BT SIA	65	1998	4.47	23
First Glass Company SIA	30	2013	2.15	8
AM studio SIA	30	2002	1.08	19
IKZ Baltic Fibre Technology Group SIA	2	2016	0.72	5
W.P.I. SIA	8	2008	1.29	13
AVT pallets SIA	6	2013	0.77	8
AK Zemgales koks	4	2012	0.68	9
DP - timber SIA	3	2017	0.59	4
Dubultkoks SIA	5	2012	0.56	9

Additional Outcomes of the Regression Analysis (Latvian SMEs):

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,4770	25,6215	6,5762	3,71747	99
Residual	-22,72155	33,53368	,00000	6,00708	99
Std. Predicted Value	-1,372	5,123	,000	1,000	99
Std. Residual	-3,744	5,525	,000	,990	99

a. Dependent Variable: Revenue


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Revenue
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0