# FINANCIAL STRUCTURE OF INNOVATIVE ORGANIZATIONS IN SERBIA

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Abstract: This paper analyses the financial structure of organizations engaged in Serbia's innovation activities that are included in the Register of Innovation Activities. The paper's specific objective refers to the assessment of sustainable financing of innovative organizations classified as development and production centres, research and development centres and innovation centres. The research is based on the financial structure analysis of 68 national innovative organizations selected from the Register of Innovation Activities. We observed the period 2015-2018 and used official financial statements from the Serbian Business Registers Agency. Our research results based on aggregate data indicate that their own financing sources predominantly finance innovation organizations. Approximately half of the individual organizations notice a higher share of liabilities in the total financing sources. Innovation organizations' activities are stimulated through budget support, cooperation with international financial organizations, funds from the Innovation Fund of the Republic of Serbia, and other funds. Financing of innovative organizations by the different national funds and international financial organizations' funds is treated as short-term liabilities until the defined criteria are realized.

**Keywords**: Innovation organizations, financial structure, funds, financial statements, Serbia

### **1. INTRODUCTION**

Innovation represents a significant determinant of competitiveness and progress of individual economies. Innovation as a driver of economic development can be defined as the practical application of new or improvement of existing goods, technologies, and services. The focus on knowledge-based activities becomes essential for gaining a competitive advantage and a prerequisite for sustainable development. The innovation activities can be identified and measured, as it seems in the European Union through the conduct of the Community Innovation Survey.

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The results are used for change analysis in the EU and individual level (Kutlača and Semenčenko, 2015, 11).

In the EU countries, the focus is on creating revolutionary innovations representing technological penetration and bringing significant technical and technological changes to the market. These innovation projects require huge investments but carry high business risk. According to the Community Innovation Survey 2016, more than 51% of business entities in the European Union with ten or more employees reported innovative activity in 2014-2016. The share of the innovative companies in the total number of companies increased or remained the same in twenty EU countries, while a decrease was recorded in eight countries. The largest share of innovative companies in the total number of companies was recorded in Belgium (68%), Portugal (67%), Finland (65%), as well as both Luxembourg and Germany (64%). On the other side, the lowest share was recorded in Romania (10%), while the share was below 30% in Poland, Bulgaria, Hungary, 22%, 27% and 29% respectively (Eurostat, 2020). Serbia belongs to the group of countries that prioritise a series of small and successive improvements to the existing products, technologies, or services. The reason for this is the limited financial resources. According to the data for the period 2008-2010, the share of innovative companies in the total number of entities in Serbia was 51.7%, of which 24.9% cooperate in the development of innovations (Mosurović Ružičić et al., 2015, 40).

Having in mind the importance of innovative activities for the competitiveness, growth and development of the national economy, the authors research the financial structure quality of national innovative organizations and their financial performances. This paper aims to analyse the financial structure and assess sustainable financing of organizations doing innovative business and registered in the Register of Innovation Activities. A significantly higher share of equity than the debt indicates a good precondition for sustaining financial stability. According to that, the research's primary hypothesis postulates that innovative organizations in Serbia are significantly financed from their own sources of funding. The research methodology includes desk research and the financial analysis that is appropriate to the research goal. The paper contributes to both innovation organizations' literature and financial structure literature.

This paper consists of five sections. The introduction is the first section, while the comprehensive summary of previous research is presented in the second section. After a literature review, the methodology and used data are explained in the third section. The fourth section summarizes the results and discussions.

# 2. REVIEW OF LITERATURE

Innovation activities represent all activities undertaken to create and apply new or improvement of existing technologies, products, services, and processes. Innovative organizations and other business entities will perform these activities. Kamberović et al. (2015) point out that invention and innovation represent two similar, but still fundamentally different terms in the legislation and professional literature. According to the Law on Innovation Activity, the invention is defined as a concept, idea and method for new product and process creating, including new technologies to exploit the national resources. Innovative organizations and other business entities will perform these activities. Innovation means any conversion of knowledge and ideas into a benefit in terms of new or improved products, services, or processes intended for commercial use or represents a public good. Creation new or modification of existing products aims to meet the consumers' needs, and requests and the process innovation leads to an increase in productivity (Beraha, 2019, 138).

Following the definition of innovation, the Law on Innovation Activity classifies innovations as product innovation, process innovation, organizational innovation, and marketing innovation. Hall (2010) highlights that investment in innovation usually includes the Research and Development costs, design, and marketing costs to generate a new product, investment in the new equipment and training.

Caseiro and Simões (2019) point out that technological progress and innovation drive economic growth, supported by the neoclassical theory of exogenous growth, and endogenous growth models. Innovation activities are the leading drivers of economic growth. Still, these activities carry a certain level of risks because the innovative firms face the degree of uncertainty associated with their output and generating future earnings in a dynamic and turbulent environment. Czarnitzkia and Kraft (2009) point out that "in the context of investment into R&D, the uncertainty of outcome is certainly present". Also, the bankruptcy costs are likely to be higher for innovative companies with a significant proportion of intangible assets (Philippe et al., 2004, 278). Finally, organizations doing business in the research and development field are exposed to the asymmetric-information problem. Its essence is reflected in that potential investor has less information about innovation projects and processes than an inventor.

Innovation firms face the funding source dilemma, and which optimal combination of debt and equity financing brings the most significant profit and reduces the risks. The optimal structure of debt and equity is in the function of generating a profit and net cash flows that provide the preconditions for a strong financial position (Vukelić et al., 2014, 681). Generally, equity financing carries fewer risks relative to debt

financing because equity represents the guarantee substance of a business entity. This is especially true for young and small innovative firms that are financially constrained. Credit constraints for small organizations arise because of information asymmetries and higher transaction costs (Wilson, 2015, 15). The optimal capital structure is the precondition for companies' growth and development. In the case of dominant use own sources of financing and limited access to loans from commercial banks, primarily in terms of their price and conditions of use, companies need to find alternative solutions for financing. Alternative sources of financing could be in the form of state funds and international financial support programs (Đuričin et al., 2013, 152).

Business entities make financing decisions depending on the amount of capital costs. Diaconu (2012) states that "the innovation firm will choose an investment level to finance so that the financial structure to be established at the lowest cost of capital". It is generally known that the tax considerations yield variations in capital costs. Due to the tax benefit, we can say that debt finance is more attractive than the reliance on the own funding sources. Hall (2010) points out that "tax considerations suggest that debt finance will be cheapest, followed by retained earnings, and lastly by new share issues". Despite the tax advantage, companies that introduce the innovations will rely more on their own funding sources (retained earnings or equity). The reason is that the "low salvage values relative to the original investment make these assets unsuitable for finance by debt" (Hall, 2010, 6). More innovative companies, i.e., firms with a higher proportion of intangible assets are likely to be less reliant on debt finance to reduce the risk of bankruptcy (Philippe et al., 2004, 278). At the same time, servicing debt needs a stable cash flow "which makes it more difficult to find the funds for innovation program" (Hall, 2010, 20). Czarnitzkia and Kraft (2009) concluded that if the management cannot pay the current liabilities, "the maximum penalty is bankruptcy.

Some empirical data show that only a low proportion of small innovative firms use external financing. It can result from managerial decisions rather than a lack of external financing (Diaconu, 2012, 71). Bartoloni (2011) points out that small innovative entities are more likely to rely on internal financing sources instead of debt to finance innovative projects.

Aghion et al. (2008) compared the innovative organizations by the R&D intensity. They concluded that entities with positive R&D tend to use debt than firms with zero R&D (Philippe et al., 2004, 284). Casson et al. (2008) point out that more innovative firms significantly relied on external financing. They use debt "as it involves giving up less control rights than new equity" (Casson et al., 2008, 220).

# **3. METHODOLOGY**

We tested the quality of financial-structural position and assess of sustainable financing of organizations that doing innovation activities. The research is based on the financial structure analysis of 68 innovation organizations in Serbia selected from the Register of Innovation Activities. The analysed group of entities includes 43 organizations classified as development and production centers, 18 research and development centers and seven innovation centers. The list of registered innovative organizations in 2019 contained 127 organizations, but 59 organizations are excluded from the analysis. Fifty-seven organizations were removed from the Register of Innovation Activities in the period before starting our research, one organization is in the bankruptcy process, and the financial statements are not publicly available for one organization. Three analysed organizations were removed from the Register in 2020, but two new registered in the same year.

The data sources are individual financial statements of innovative organizations publicly available in the Register of Financial Statements of the Business Registers Agency of the Republic of Serbia (SBRA). The financial statements are transparent sources of information on the state of assets, equity and liabilities, the net results and other comprehensive income, cash flows and changes in equity. The financial statements are an important information resource for business decision-making and a basis for financial analysis (Vukelić et al., 2016, 266). We examine the financial structure of these organizations in the four years (2015-2018). The balance sheet is the basis for financial structure analysis of innovative entities on an aggregate and individual levels and assessing the risks to which the companies are exposed. By analysing of the debt-to-equity ratio, the authors got the information about the dominant finance source and assessed the quality of their capital structure. The income statements provide a good assumption to evaluate national innovation organizations' financial performance and earning capacities.

For evaluation, the authors performed the analysis of innovative organizations' financial structure on an aggregate level and by size. The entities are classified as micro, small, medium, or large-sized based on the average number of employees, operating income, and the average value of total assets on 31 December 2018. In the last analysed year, micro-entities are the most numerous in the total number of innovative organizations registered in the Register of Innovation Activities. About 53% of organizations (36 entities) are classified as micro and 30 innovative organizations as small. In the same period, one organization is classified as a medium and one as a large-size entity.

### **4. RESULTS AND DISCUSSION**

The results of analysis based on aggregate data show that their own financing sources predominantly finance innovation organizations. Figure 1 shows the share of equity and liabilities in the total financing sources in the period 2015-2018. The proportion of equity in the total financing sources ranged from 75.3% in 2015 to 79.2% in 2018. A significantly higher share of equity than the debt indicates a good and stable aggregate financial-structural position. Due to equity's ability to absorb losses caused by unrealistic management estimates and bad investments, creditors expect a more dominant share of equity in the total funding sources (Marinković, 2019, 22).



Figure 1. The share of equity and liabilities in the aggregate balance sheet

Source: Authors' calculation based on SBRA data

Table 1 shows the detailed structure of innovative organizations' total liabilities and equity in 2015-2018. Own financing sources dominated in the analysed period. Also, the growth tendency was noticed in absolute amounts. Equity increased by 26% in 2018 compared to 2015. Liabilities recorded a smaller share in the aggregate balance sheet in the observed four-year period.

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Balance sheet position	2015	2016	2017	2018
Basic capital	4,212,001	4,320,249	4,413,895	4,430,558
Subscribed capital unpaid	206	206	18,095	206
Repurchased own shares	0	0	2,206	2,206
Reserves	870,881	914,081	961,595	999,866
Revaluation reserves	2,370,141	2,369,511	2,391,338	2,144,931
Unrealized gains				
Unrealized losses	3	2	2	2
Retained earnings	3,905,549	4,870,286	5,691,274	6,758,762
Loss	270,666	268,921	361,022	349,682
EQUITY	11,088,109	12,205,410	13,112,967	13,982,433
Long-term provisions and	153,769	244,746	956,395	1,022,459
liabilities				
Deferred tax liabilities	12,085	11,762	73,388	75,760
Short-term liabilities	3,472,451	2,966,135	2,443,878	2,579,531
Total liabilities	3,638,305	3,222,643	3,473,661	3,677,750
Total liabilities and equity	14,726,414	15,428,053	16,586,628	17,660,183

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Table 1. Total liabilities and equity of innovative organizations (in 000 dinars)

Source: Authors' calculation based on SBRA data

The retained earnings were the dominant balance sheet item in the capital structure. Its share in the equity ranged from 35.2% in 2015 to 48.3% in 2018. The proportion of basic capital in the equity structure increased from 31.7% in 2015 to 38% in 2018. Revaluation reserves recorded a more significant share and ranged from 15.3% in 2018 to 21.4% in 2015. The losses up to the amount of equity show the cumulative effects of bad business activities and represent a correction in the value of equity (Belopavlović, 2015, 321). The accumulated losses oscillate in the observed period and range from 2.2% to 2.8%. Other balance sheet items that represent the equity components had an extremely low share in the observed period and were not shown in the capital structure in Figure 2.

Net working capital has an important role in assessing the organization's ability to maintain long-term financial stability showing whether and to what extent long-term capital is sufficient to cover long-term assets. The direction of changes in the financial stability can be shown by the net working capital analysis and its determinants (Stevanović, 2015, 351). Net working capital is defined as the difference between current assets and short-term liabilities. It represents the part of current assets that is financed by long-term financing sources. It is expected that net working capital is positive to ensure good preconditions for liquidity. The analysis results based on aggregate data show that innovative organizations noticed a positive net working capital with a pronounced growth trend. Compared to the first year of

analysis, registered innovative entities achieved a net working capital growth by 74% in 2018.



Figure 2. The capital structure of innovative organizations in 2015-2018.

Source: Authors' calculation based on SBRA data

Figure 3 represents the share of innovative organizations with positive and negative net working capital, observing an average level in 2015-2018. The most innovative firms had higher current assets than short-term liabilities in the observed four years (48 organizations or 70.6%), while seven organizations or 10.3% moved from negative to positive net working capital. Two mentioned groups of organizations that encompass approximately 81% of analysed innovative organizations noticed the positive net working capital or movement from negative to positive that indicates financial stability.

The financial-structural position of ten innovative companies (10.7%) indicates the problem of illiquidity due to higher short-term liabilities in relation to current assets. Three innovative firms or 4.4% had positive net working capital in the first observed years, but they faced disturbing financial position and liquidity problems during the time.



Figure 3. Net working capital of innovative organizations in 2015-2018.

Source: Authors' calculation based on SBRA data

The analysed innovative organizations predominantly operated with a net profit in 2015-2018 that is a good precondition for sustaining financial stability. Figure 4 shows net results of innovative organizations in the period 2015-2018. About 75% of organizations achieved a positive net financial result in all years of the observed period, while only one generated total expenditures higher than total revenues in all four years. Organizations operating with net profit and net loss, depending on the observed year, make up 24% of the total number of innovative organizations (4.5% have a net profit in three years; 10.4% have a net profit in two years; 9% have a net profit in just one year).

#### Figure 4. Net results of innovative organizations in 2015-2018.



An enterprise that consistently generates losses is not capable of survival. Many of such enterprises distort the earning capacity image and the financial structure of the group that they belong to (Stevanović, 2015, 349). The analysis results confirmed only seven organizations (about 10%) operated with a loss above the amount of capital in some or all years of analysis. The share a loss above equity value in total balance sheet sum was low and ranged from 0.072% to 0.19%. The low proportion indicated an insignificant impact on the aggregate financial-structural position of innovative firms. All firms that operated with a loss above equity belong to the group of micro-entities.

Although aggregate data significantly show equity financing, it is extremely important to make conclusions carefully. Through an in-depth analysis by individual innovative organizations, the authors concluded that dominant equity financing is strongly influenced by several innovative organizations. The analysis by individual organizations shows that more than half of the analysed innovative firms significantly finance by debt.

Observing the organizations by size, the authors concluded that one medium and one large organization have an extremely favourable financial-structural position with a dominant share of equity in total funding sources (89.9% in 2015 to 92.4% in 2017. The organization classified as large, has a strong influence on innovative organizations' aggregate financial structure, which is confirmed by its share in the total equity (52.5%).

The equity and liabilities of micro-innovative organizations show a growing tendency over time in absolute amounts. Figure 5 shows the debt-equity ratio in 36 micro entities. In all analysed years, micro-innovative entities significantly financed their business from borrowed financial sources. The proportion of debt in total funding sources ranged from 62% to 69.4%. Although the number of micro entities dominates in analyzed groups, their share in the aggregate balance sheet is low (equity ranged from 1.2% to 1.5%, and liabilities ranged from 6% to 11.9%). Based on the above, the authors concluded that innovative micro organizations have a small influence on the aggregate financial structure.



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Source: Authors' calculation based on SBRA data

The results of the analysis of 30 organizations belonging to the group of small enterprises show significant reliance on their own financing sources in the whole observed period (Figure 6). The proportion of equity increased from 64.1% in the first year of analysis to 69.9% in 2018. This ratio is heavily influenced by several, but especially by one organization. Observed by individual organizations, most small firms have significant financing from their own sources. This conclusion coincides with the results of the analysis on an aggregate level.



Figure 6. The share of equity and liabilities in small innovative organizations

■Equity ■Total liabilities

Source: Authors' calculation based on SBRA data

The short-term liabilities were dominant in the debt structure, with a tendency their decrease in favour of the long-term provisions and liabilities. The share of short-term liabilities in total liabilities amounted to 95.4% in the first year of analysis, while a decrease was recorded in 2018 (70.1%). The short-term liabilities were also reduced in absolute amounts. This debt amounted to 3,472 thousand dinars in 2015 and 2,579 thousand dinars in 2018, representing a decrease of 25.7%.

Structure of short-term liabilities	2015	2016	2017	2018
Short-term financial liabilities	329,641	166,128	194,071	315,083
Received advances, deposits and caution money	145,850	256,383	251,457	190,393
Liabilities from business operations	1,257,520	1,212,670	1,135,418	1,190,544
Other short-term liabilities	951,435	974,642	467,485	475,225
Liabilities for Value Added Tax	43,394	63,452	56,898	66,272
Liabilities for other taxes, contributions and other duties	66,121	50,207	18,514	58,072
Accruals and deferred income	678,490	242,653	320,035	283,942
Short-term liabilities	3,472,451	2,966,135	2,443,878	2,579,531

Table 2. Structure of short-term liabilities (in 000 dinars)

Source: Authors' calculation based on SBRA data

As Table 2 shows, liabilities from business operations and other short-term liabilities account for more than 50% of total short-term liabilities on an aggregate level. The same conclusion can be drawn if we look at the organizations by size. Liabilities based on project subsidies or government grants under contracts represent the accruals and deferred income that is a short-term liability.

According to the Strategy on Scientific and Technological Development of the Republic of Serbia for the period 2016 - 2020: Research for Innovation, innovation activity is encouraged through budget support, cooperation with international financial organizations, funds from the Innovation Fund, and other funds. The Innovation Fund of the Republic of Serbia provides support for the development of innovations through the mini-grant program, matching grants program, collaborative grant scheme program, and innovation vouchers.

Innovative organization financing from state funds for stimulating innovation is treated as a short-term liability until the defined criteria are realized, and contract obligations fulfilled. State support received before the fulfilments of defined criteria are recognized as accrual and deferred income at fair value. Government grants that are not conditioned by the fulfilment of some obligations recognize as revenue in the income statements. If government funds are conditioned by achieving specific results, revenue can be recognized if pre-defined criteria are realized. Figure 7 represents short-term liabilities and accrual and deferred income in the period 2015-2018.





Source: Authors' calculation based on SBRA data

Figure 7 shows the oscillations in the accruals and deferred income movement during the analysed period. Their decrease was evident in the last analysed year compared to the initial accounting period (decrease by 58.2%). The share of accruals and deferred income in the structure of total short-term liabilities ranged from 19.5% in 2015 to 11% in 2018.

The analysis results by organizations observed by size show that the small entities had the largest share of accrual and deferred income in total short-term liabilities (the share ranged from 8.9% to 21.2%). These organizations also recorded the largest absolute amount of mentioned balance sheet items. The smallest participation is evident in medium and large innovative organizations (ranged from 0.5% to 2.6%). 60% of innovative organizations that report the accrual and deferred income refer to the small organizations (23 of 41 organizations).

Financing of registered innovation organizations by the Innovation Fund of Republic of Serbia, the other state funds, and international financial organizations' funds to stimulate innovation is treated as income from premiums, subventions, donations or as accruals and deferred income until the defined contracts' criteria are realized. Revenues from premiums, subsidies, grants, donations, are the group of revenues that belong to operating revenues. This group includes income generated from the state budget, province, local governments, but also revenues from donations or grants from foreign governments, international organizations, private foundations, and similar sources (Official Gazette RS, 2020).

Most of the analysed innovative organizations (66% or 44 innovative organizations) report revenues from premiums, subsidies, grants, donations in the income statement whereby 31% of all analysed organizations (or 21 organizations) continuously generating these revenues in the period 2015-2018. The share of the revenue from premiums, subventions, and donations in total operating income in the above mentioned 31% of organizations is presented on an average level in figure 8.

Figure 8. The share of the revenue from premiums, subventions, and donations in total operating income in 31% organizations (on average in 2015-2018)



Source: Authors' calculation based on SBRA data

Revenues from premiums, subsidies, grants, donations are more than 40% of total operating revenues in about 48% of organizations that record these revenues in all analysed period. In 38% of these organizations, observed revenues are over 60% of their total operating revenues. About 30% of these organizations share the revenues from premiums, subsidies, grants, and donations lower than 20% total operating revenues.

About 34% of organizations generate these revenues in some of the observed years. The same number of analysed organizations (23 entities) do not make these revenues in 2015-2018, but some record accruals and deferred income. The funds received under a project grant agreement are recorded on this balance sheet item, but they will be recognized as revenue only after realizing defined criteria.

Considering the notes to the financial statements of individual organizations as a part of financial statements set, we remarked the structure of the revenues from premiums, subsidies, grants, donations. These revenues include financial resources from Innovation Fund programs, subventions from Development Fund of Serbia, support programs of the Development Agency of Serbia, projects of the Ministry of Education, Science and Technological Development, and the European Commission's projects, USAID and similarly.

#### **5. CONCLUSION**

The paper presents systematic research of organizations' financial structure quality included in the national Register of Innovation Organizations. The primary hypothesis that relates to the sources of funding is partially accepted. The analysis results based on aggregate data show that innovation organizations are predominantly financed by their own financing sources (75.3% in 2015; 79.2% in 2018). Through an in-depth analysis by organizations observed by size, the authors concluded that dominant equity financing is strongly influenced by several innovative organizations. One medium and one large organization have an extremely favourable financial-structural position with a predominant share of equity in total funding sources (89.9% in 2015 to 92.4% in 2017). The analysis results of 30 small organizations show significant reliance on their own financing sources (the proportion of equity increased from 64.1% in the first year of analysis to 69.9% in 2018). The micro-innovative entities significantly financed their business from borrowed financial sources. The proportion of debt in total funding sources ranged from 62% to 69.4%. The analysis by individual organizations shows that approximately half of the analysed innovative organizations notice a higher share of liabilities in the total financing sources. The short-term liabilities are dominant in liabilities structure, with a tendency their decrease. Financing of registered innovation organizations by the Innovation Fund of Republic of Serbia, the other state funds, and international financial organizations' funds to stimulate innovation is treated as short-term liabilities until the defined criteria are realized. The presented results contribute to considering different possibilities of financing innovation organizations. The paper's special contribution is that the analysis is focused on the options of financing innovation organizations from various sources to support innovation.

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