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The Impact of Regional Integration in GVCs on Subsidy Allocation Among Manufacturing Firms in Russia[1]

Abstract. While global demand for industrial policy-making continues to rise, increasing attention is being given to how these policies are shaped by participation in global value chains (GVCs), both in developed and developing countries. However, much of the research overlooks the regional dimension of support allocation, particularly the integration of regional economies into GVCs. This study aims to address this gap by examining the factors influencing state support at the regional level, with a focus on backward and forward linkages within GVCs in the manufacturing sector. The analysis is based on a survey of 1,900 Russian manufacturing firms conducted between August and November 2022, using data from 2019 to 2022 across various sectors and firm sizes. The findings show that Russian regional governments generally adopt conservative strategies when allocating financial support, focusing on a core group of companies crucial for maintaining regional economic stability. This support is primarily directed at exporters and firms fulfilling government contracts, with state-affiliated companies becoming the primary beneficiaries due to shifts in external conditions. Additionally, regions with greater integration into the global economy tend to adopt a more vertical policy approach, favoring large, GVC-integrated firms, while less integrated regions prioritize smaller firms, especially SMEs. Regions with stronger downstream linkages focus on supporting innovation-active firms to advance localization, import substitution, and technological independence goals. These findings highlight emerging priorities in Russia's industrial policy, suggesting that regional initiatives are needed to strategically reposition the country's regional economies in the global landscape amidst changing global dynamics.

Keywords: subsidies, manufacturing subsidies, public support, federal level public support, regional level public support, global value chains, Russian regions

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RESEARCH ARTICLE

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Влияние участия региона в глобальных цепочках создания стоимости на распределение бюджетных субсидий среди промышленных предприятий в России

Аннотация. Растет запрос на промышленную политику как в развивающихся, так и развитых странах, при этом особое внимание уделяется ее проектированию применительно к позиционированию в глобальных цепочках создания стоимости. Существует провал в исследованиях, где фокус государственной поддержки, поступающей из региональных бюджетов, связывается с характером интеграции региональной экономики в глобальные цепочки создания стоимости (ГЦСС). Вот почему цель данного исследования — анализ факторов предоставления компаниям государственной поддержки из региональных бюджетов в зависимости от степени интеграции регионов в восходящие и нисходящие связи в ГЦСС в обрабатывающей промышленности. Для проведения анализа используется опрос руководителей 1,9 тысяч российских предприятий обрабатывающих отраслей, проведенный в августе — ноябре 2022 г.. Выборка включает в себя показатели деятельности компаний в 2019–2022 гг., репрезентативна в разрезе видов экономической деятельности и размерных групп предприятий. Мы находим, что финансовая поддержка компаний из региональных бюджетов более консервативна (менее поисковая по сравнению с поддержкой из федеральных бюджетов) и направлена на поддержку некоторого «ядра» компаний, значимых для устойчивости региональной экономики. Фокусом поддержки, распределяемой в регионах, выступают компании-экспортеры, а в последние годы также компании, выполняющие госзаказ. В 2022 г. в радикально изменившихся внешних условиях произошла смена представлений о драйверах развития — среди получателей поддержки вперед вышли компании с государственным участием. При наличии более существенной интеграции в глобальную экономику региональная политика становится более вертикальной, направленной на поддержку крупных, интегрированных в ГЦСС компаний, а при меньшей интегрированности — более горизонтальной, поисковой, связанной с поддержкой МСП. Для тех регионов, которые больше интегрированы в нисходящие связи (по сравнению с восходящими), заметно внимание к поддержке инновационно-активных компаний в интересах решения задач локализации, импортозамещения, технологической независимости. Наши результаты показывают некоторые латентные, но складывающиеся на практике приоритеты в промышленной политике. Как следствие, на уровне регионов можно обсуждать дополнительные инициативы содействия репозиционированию экономик российских регионов в глобальной экономике в условиях новой реальности.

Ключевые слова: субсидии, субсидии обрабатывающему комплексу, государственная поддержка, государственная поддержка на региональном уровне, глобальные цепочки создания ценности, российские регионы

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Introduction

In recent decades, the role of the state in the economy has notably evolved, particularly in response to crises like the global financial crisis of 2008–2009 and the pandemic-induced structural crisis of 2020–2021. These events have led governments in developed countries to adopt more proactive approaches to state intervention, especially through direct financial assistance to companies as a key tool in industrial policy (Rodrik, 2009). This shift reflects a growing recognition of the significance of industrial policy in managing structural transformations during crises, resulting in the adjustment and improvement of industrial policies (Aiginger & Rodrik, 2020).

Regional authorities are essential in implementing state industrial policy, particularly in large countries with diverse territorial

conditions. They can more effectively address local nuances, integrate resources, and engage with various business sectors (Yakovlev et al., 2018). However, researchers, experts, and policymakers are increasingly concerned that regional policies often fail to adequately tackle local development challenges and reduce territorial inequality (Austin et al., 2018; Südekum, 2021). In more developed regions, companies tend to receive greater financial support from the state, which can be illustrated by countries such as China, the United States, and Spain (Graddy-Reed & Lanahan, 2023; Guerrero et al., 2024; Deng et al., 2020). This trend may exacerbate existing issues, as successful enterprises are drawn to thriving regions, leaving lagging areas further behind due to agglomeration forces, digitalization, and labor market deficiencies (Südekum, 2021; Moretti, 2013; Rastvortseva & Snitko, 2020; Kutsenko & Eferin, 2019).

Russian regional industrial policy needs refinement (Danilova et al., 2022; Kutsenko et al., 2019; Romanova & Ponomareva, 2020). To promote economic growth and development, it is essential to create regional industrial policies that address market failures, enhance the positive effects of agglomerations, strengthen agglomeration forces, lower barriers to innovation, and facilitate beneficial structural shifts toward industrial specialization (Davidson et al., 2018; Eferina et al., 2016; Grebenkin, 2020; Kutsenko & Eferin, 2019; Rastvortseva & Snitko, 2020).

The analysis of how state support is allocated among firms is particularly interesting; the studies in question examine this allocation in relation to the distinct characteristics of firms, focusing on Russia and on a global scale (Blanes & Busom, 2004; Simachev & Kuzyk, 2020).

Currently, there is limited research on how support is distributed in relation to the structural characteristics of regional development. There is evidence that modern industrial policy should focus on increasing participation in global value chains (GVCs) (De Marchi & Alford, 2022), as this can enhance enterprise efficiency and competitiveness, promote modernization, strengthen absorptive capacity, create subcontracting networks, and generate positive externalities for related industries, ultimately contributing to industrial modernization (Gereffi, 2005; Giulliani et al., 2005; Pietrobelli & Puppato, 2016; Pietrobelli & Staritz, 2018).

This study investigates the factors that influence regional financial support for Russian manufacturing enterprises and analyses the differences determined by their level of integration into global value chains. The remainder of the article is structured as follows: first, it presents research findings on the determinants of state support distribution; next, it outlines the data, econometric evaluation methodology, and the proposed approach to categorizing regions based on their GVC participation characteristics. Finally, the results of the econometric evaluation are presented, along with a discussion of their implications for policy.

Review of Literature on the Distribution of State Support

The effectiveness of state support measures aimed at fostering entrepreneurship is surrounded by much debate in academic literature, both theoretically and empirically (Pergelova & Angulo-Ruiz, 2014). To support our hypothesis regarding the distribution of government assistance aimed at stimulating firms involved in GVCs, it is crucial to examine the theoretical foundations that underscore the important role of government support in improving firms' performance. For this purpose, we refer to the resource-based view (RBV), which suggests that for a company to achieve competitiveness in the international market, it must develop competitive advantages. Given the often limited financial and human resources, firms actively seek resources from the external environment to enhance organizational capabilities and improve firm performance (Bruton et al., 2007; Lu et al., 2010; Teece et al., 1997). Both financial and organizational support contribute to the development of firm competencies, thereby enhancing competitiveness (Bennett & Robinson, 2003). Thus, from the RBV perspective, we argue that access to government support positively influences performance outcomes.

We further enrich this argument with insights from institutional theory, which asserts that government support can affect resource flows to firms through both direct resource provision and legitimacy-enhancing mechanisms that influence deal-making and financing opportunities (Barreto & Baden-Fuller, 2006).

Numerous empirical studies have examined which firms receive government support, identifying various factors that influence their likelihood of applying for and obtaining assistance. Generally, larger companies tend to seek and secure subsidies more frequently (Blanes & Busom, 2004; Busom et al., 2017; Simachev & Kuzyk, 2020). In contrast, small and medium-sized enterprises (SMEs) often receive larger support packages relative to their size (Takalo et al., 2013a; 2013b). The relationship between a firm's age and its likelihood of receiving support is less clear: some studies suggest that younger

firms are more likely to obtain assistance (Huergo & Trenado, 2010; Decramer & Vanormelingen, 2016; Simachev & Kuzyk, 2020), while others find age to be insignificant (Blanes & Busom, 2004; Takalo et al., 2013a) or indicate that older firms receive support more frequently (Antonelli & Crespi, 2012; Aschhoff, 2010), which may be due to perceptions of reliability and the potential for implementing new technologies.

Exporters are often proactive in seeking governmental aid to mitigate market risks and replenish budgets (Busom et al., 2017; Huergo, Trenado, 2010; Simachev & Kuzyk, 2020; Takalo et al., 2013a; 2013b; Yakovlev et al., 2020). Subsidies are particularly crucial for companies entering new domestic markets, especially those involved in product innovation (Czarnitzki & Toole, 2007). The allocation of support varies significantly based on industry technological intensity and levels of innovation. Sectors classified as high – and medium-technology tend to receive more substantial support (Busom et al., 2017; Huergo & Trenado, 2010; Wu & Liu Cheng, 2011). Furthermore, the extent of innovation activities and digitalization within a sector positively influences its likelihood of receiving subsidies (Wu & Liu Cheng, 2011; Yu et al., 2023).

State-owned companies often secure R&D subsidies due to their own significant investments in research and development, as well as their political connections, which help mitigate information disparities compared to private firms (Dai & Cheng, 2015). Political connections, particularly those linked to state ownership, are positively correlated with receiving government support and securing state contracts, highlighting the complex role of the state (Wu & Liu Cheng, 2011; Simachev & Kuzyk, 2020; Yakovlev et al., 2020; Yakovlev, 2010; Zhemkova, 2023; Szakonyi, 2018).

Government support from federal and regional budgets often exhibits bias, primarily focusing on attracting investments and expanding employment rather than enhancing total factor productivity (Bernini & Pellegrini, 2011). This bias is particularly evident in large developing countries like China, where local governments tend to prioritize assistance for less profitable companies, including high-tech firms, state-owned enterprises, and exporters (Peng et al., 2021).

While the general factors influencing the distribution of government support are well-documented, the determinants of regional differences in this distribution remain less understood. In particular, the regional characteristics that affect how support is allocated are still not fully explored (Broekel et al., 2015). Research indicates that firms located in economically developed regions and high-tech clusters are more likely to receive support, owing to their higher levels of innovation activity (Broekel et al., 2015; Nieto & Santamaría, 2007). Moreover, the impact of subsidies on enterprise innovation varies across regions with differing levels of economic development, with stronger incentives for innovation found in more developed areas (Liu et al., 2019). This underscores the importance of considering regional characteristics when analysing the distribution of government support.

Drawing on the results of previous studies regarding the distribution of government support among Russian companies—especially the tendency to favor exporting companies and companies involved in innovation activities—we hypothesize that this distribution pattern may vary at the regional level. We propose the following hypothesis:

Hypothesis: Regions' participation in global value chains influences how their governments allocate financial support, leading regions heavily involved in GVCs to prioritize assistance for companies within these chains.

Data and Methodology

Data

For our empirical analysis, we use a database developed during the project "Competitiveness of Russian Enterprises: Response to Crisis and Development Factors," funded by the Basic Research Program of the National Research University Higher School of Economics. As part of this project, we surveyed managers of manufacturing enterprises from August to November 2022. As a result, we obtained a sample of approximately 1,900 observations for different sectors and sizes of enterprises. The data are unique as they indicate whether these enterprises received regional financial support between 2019 and 2022, alongside a wide range of control variables. The selection of these variables was guided by existing research and available data, as discussed in the Literature Review section. The descriptions of the variables are provided in Table 1.

Methodology

To analyse the allocation process effectively, we need to distinguish between firms' application behaviors and the decisions of public agencies on grant allocations (Blanes & Busom, 2004). A common challenge in this area is to identify unsuccessful applications and the characteristics of rejected projects, which complicates the distinction between agency selection criteria and factors affecting firm behaviour (Bannò & Sgobbi,

Table 1

Descriptions of variables

Variables	Description
Dependent variable	
Regional subsidy	The enterprise received subsidies from regional executive authorities. This variable is recorded for each year from 2019 to 2022 and is a dummy variable, where 1 indicates that the enterprise received subsidies and 0 indicates that it did not.
Independent variables	
Small	Number of full-time employees at the enterprise: 15 to 100. This is a dummy variable, where 1 indicates that the enterprise employs between 15 and 100 people, and 0 indicates that it does not.
Medium	Number of full-time employees: 101 to 250. This is a dummy variable, where 1 indicates that the enterprise employs between 101 and 250 people, and 0 indicates that it does not.
Large	Number of full-time employees: over 250. This is a dummy variable, where 1 indicates that the enterprise employs over 250 people, and 0 indicates that it does not.
Foreign ownership	This dummy variable indicates foreign private ownership, with a value of 1 if the enterprise has foreign private owners (individuals or companies) and 0 if it does not.
Public ownership	This dummy variable indicates government ownership, with a value of 1 if federal, regional, or local government authorities are among the enterprise's owners, and 0 if not.
R&D	This dummy variable reflects R&D financing, with a value of 1 if the enterprise financed R&D activities from 2019 to 2021, and 0 if it did not.
Part of a holding	This dummy variable indicates holding company affiliation, with a value of 1 if the enterprise is part of a holding company, and 0 if it is not.
Export	This dummy variable represents direct exporting activity, with a value of 1 if the enterprise was a direct exporter from 2019 to 2022, and 0 if it was not.
Import	This dummy variable represents direct importing activity, with a value of 1 if the enterprise was a direct importer from 2019 to 2022, and 0 if it was not.
Innovations	This dummy variable indicates innovation implementation, with a value of 1 if the enterprise implemented product and/or technological innovations from 2019 to 2022, and 0 if it did not.
Public procurement	This dummy variable indicates whether the enterprise supplied goods under government contracts between 2019 and 2022, with a value of 1 if it did, and 0 if it did not.
Age	Age of the enterprise

Source: Compiled by the authors

2010; Blanes & Busom, 2004). This requires an empirical approach that incorporates both firm applications and agency allocation processes, using control variables to account for agency screening criteria and firm behaviour determinants (Blanes & Busom, 2004). This method allows for a more accurate and comprehensive understanding of the allocation process.

Our empirical analysis is based on estimating the following equation:

$$Subsidy_{ijk} = \alpha Firm\ Characteristics_i + \partial_j + \gamma_k + \varepsilon_i, \quad (1)$$

where the dependent variable is the dummy variable $Subsidy_{ijk}$, which takes the value of 1 if company i in industry j in region k received a regional subsidy in period t and 0 otherwise. Firm characteristicsi are a set of explanatory variables that include agency's screening rules alongside the determinants of firm behaviour, ∂_j – industry dummy variables to account for regional specificity and unobserved subsidy distribution peculiarities at the regional level, γ_k – regional dummy variables to account for industry-specific characteristics, ε_i – regression residual.

The dependent variable should indicate whether a company receives support, rather than the amount of support relative to company size. This approach focuses on analysing support distribution rather than subsidy intensity, which would require additional data. Previous research has largely examined subsidy receipt in this way (Bannò & Sgobbi, 2010; Blanes & Busom, 2004).

To assess Equation (1), the analysis should proceed in two stages. First, firms receiving regional support should be examined by estimating the equation for the entire 2019–2022 period as well as for each year within this timeframe, accounting for potential variations during the crises of 2020 and 2022 using probit estimation. In the second stage, regions should be categorized based on their GVC participation, and Equation

(1) should be estimated for the full 2019–2022 period. For small samples and rare events, the Firth logit method should be applied (Krenz, 2024; Woo et al., 2023). Robustness tests should include regressions for subsamples, both with and without regional dummy variables.

Assessment of Russian Regions' Participation in GVCs

Assessments of Russian regions' involvement in GVCs usually rely on export and import quotas relative to regional GDP (Akbulatov et al., 2019; Volkova & Yerygin, 2018). While this method is straightforward to calculate, it fails to account for domestic value added in international trade. In our study, we propose a novel approach that utilizes OECD TiVA project data in conjunction with statistics from the Russian Federal Customs Service, focusing on 2018 data prior to the crisis. This allows for a more unbiased assessment of regional participation in GVCs, specifically within the manufacturing sector. We assume a similar level of sectoral participation across regions, although supply chain structures may differ in detail. Despite these potential variations, sectoral participation can serve as a reasonable proxy for regional involvement at an aggregated level. Future research should critically examine this assumption.

Based on our assumption, we use standard indicators measuring backward and forward industry participation in GVCs. Backward participation measures the foreign value added share of gross exports for each industry, while forward participation measures the domestic value added in gross exports of intermediate products.

To calculate aggregated GVC participation measures for each region, we compute weighted averages of backward and forward participation across all manufacturing sectors using these shares and specific formulae:

$$Backward\ participation_k = \frac{\sum_{j=1}^{n} w_{jk} \times Backward\ participation_j}{\sum_{j=1}^{n} w_{jk}}, \quad (2)$$

$$Forward\ participation_k = \frac{\sum_{j=1}^{n} w_{jk} \times Forward\ participation_j}{\sum_{j=1}^{n} w_{jk}}, \quad (3)$$

where w_{jk} is the share of industry j's exports in the total exports of the manufacturing complex in region k.

Then, regions were classified depending on their involvement in GVCs. Given the novelty of our research, we have chosen the following approach: we categorized regions based on their levels of backward and forward linkage participation in

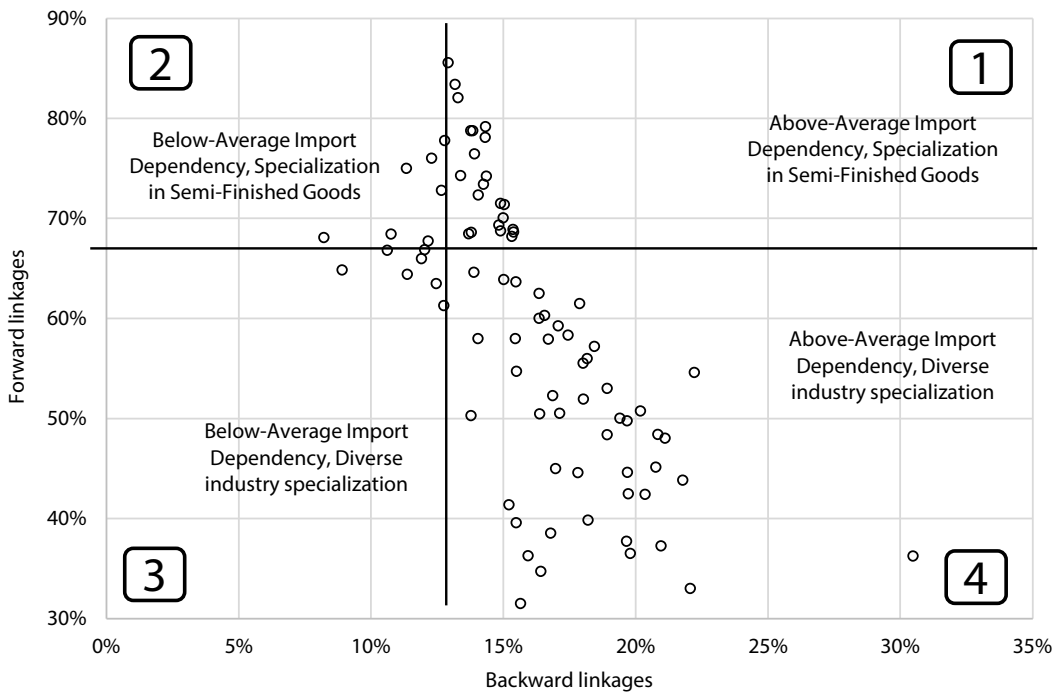

Fig. 1. *Participation of Russian regions in backward and forward linkages of GVCs in the manufacturing sector, 2018*

Source: authors' calculations use data from TiVA OECD (OECD (2024). Trade in value added. OECD Statistics on Trade in Value Added (database). URL: https://doi.org/10.1787/data-00648-en (Date of access: 01.10.2023)), the Federal Customs Service of Russia (URL: https://customs.gov.ru/statistic (Date of access: 12.05.2023)).

the manufacturing sector relative to the national average. This average reflects the entire Russian economy rather than just the sampled data. Our estimates using TiVA data indicate a national average of 13.2 % for backward linkages and 66.2 % for forward linkages. Figure 1 illustrates the results of this classification.

Our classification reveals four distinct groups of regions. The first group includes such regions as Kirov, Arkhangelsk, Novgorod, Sverdlovsk, and Perm Oblasts, totalling 20 regions. The second group comprises regions such as Leningrad, Krasnodar, and Orenburg Oblasts, totaling 11 regions. The third group consists of major urban centres like Moscow, St. Petersburg, the republics of Tatarstan and Bashkortostan. Finally, the fourth group, the largest one, includes 48 regions primarily from the Central and Volga Federal Okrugs, as well as the North Caucasus and Southern Russia. Table 2 provides information on the distribution of all the regions into four distinct groups.

Results

Which Russian manufacturing companies receive subsidies?

Our empirical findings, outlined in Table 3, column (1), show that export-oriented enterprises and those involved in government procurement were more likely to receive subsidies from 2019 to 2022, which is consistent with prior research on Russia (e.g., Simachev, Kuzyk, 2020; Yakovlev et al., 2020). Analysing each year individually from 2019 to 2022, our probability regression analysis (detailed in columns (2)-(5) of Table 3) consistently shows that companies receiving regional support are typically heavily engaged in export activities, which means that they play an important role in regional economies. Notably, since 2020, we observe a correlation between regional support and involvement in government contracts. This pattern remains stable across the entire period, reinforcing our findings.

Furthermore, older companies generally received support more frequently, except in 2020, likely due to the acute phase of the Covid-19 crisis, which required the government to provide aid to previously unsupported companies. In 2021, variables such as foreign ownership and the presence of imports became significant, possibly reflecting a shift in regional support towards companies with foreign participation and importers during the period of recovery from the pandemic crisis. However, in 2022, amidst stringent external sanctions, regional support in Russia prioritized stability and independence, favouring large enterprises, companies in the public sector, and those involved in government procurement (column 5 of Table 3).

Table 2

Classification of Russian regions by GVC participation in the manufacturing sector, 2018

Group 1: Above-Average Import Dependency, Specialization in Semi-Finished Goods	Group 2: Below-Average Import Dependency, Specialization in Semi-Finished Goods	Group 3: Below-Average Import Dependency, Diverse industry specialization	Group 4: Above-Average Import Dependency, Diverse industry specialization
Arkhangelsk, Belgorod, Vologda, Irkutsk, Kirov, Kostroma, Lipetsk, Novgorod, Perm, Pskov, Sverdlovsk, Tomsk, Tula, Chelyabinsk, Murmansk Oblasts, Zabaykalsky Krai, Republic of Ingushetia, Republic of Karelia, Republic of Komi, Republic of North Ossetia-Alania	Krasnodar, Krasnoyarsk, Khabarovsk, Volgograd, Kemerovo, Leningrad, Orenburg, Tyumen Oblasts, Khanty-Mansi Autonomous Okrug, Republic of Khakassia, Jewish Autonomous Okrug	St. Petersburg City, Moscow City, Republic of Bashkortostan, Republic of Tatarstan	Altai Krai, Primorsky Krai, Stavropol, Amur, Astrakhan, Bryansk Vladimir, Voronezh, Nizhny Novgorod, Ivanovo, Kaliningrad, Tver, Kaluga, Kamchatka, Samara, Kurgan, Kursk, Magadan, Moscow, Novosibirsk, Omsk, Oryol, Penza, Rostov, Ryazan, Saratov, Sakhalin, Smolensk, Tambov, Ulyanovsk, Yaroslavl Oblasts, Republic of Crimea, Sevastopol City, Chukotka Autonomous Okrug, Republic of Adygea, Republic of Buryatia, Republic of Dagestan, Kabardino-Balkar Republic, Altai Republic, Republic of Kalmykia, Mari El Republic, Republic of Mordovia, Karachay-Cherkess Republic, Tuva Republic, Udmurt Republic, Chechen Republic, Chuvash Republic, Sakha Republic

Source: Compiled by the author

Table 3

Factors Affecting Financial Subsidy Allocation at the Regional Level - Probit Regression Analysis

	Overall period (at least once)	2019	2020	2021	2022
	(1)	(2)	(3)	(4)	(5)
Small	0.0447***	–0.0672	0.0223	0.00831	–0.0205
	(0.0171)	(0.1360)	(0.0151)	(0.0157)	(0.0150)
Medium	0.0159	0.00634	0.000079	–0.00767	0.00642
	(0.0226)	(0.1810)	(0.0199)	(0.0208)	(0.0174)
Large	0.0373	0.339	0.0361	0.0212	0.0326*
	(0.0270)	(0.2070)	(0.0235)	(0.0246)	(0.0194)
Foreign ownership	0.035	0.532	0.046	0.0872**	0.0115
	(0.0445)	(0.3400)	(0.0399)	(0.0386)	(0.0315)
Public ownership	0.0849	0.135	0.0145	0.0565	0.0726*
	(0.0552)	(0.4610)	(0.0543)	(0.0491)	(0.0394)
R&D	0.0185	0.159	0.0152	0.0146	0.0204
	(0.0200)	(0.1630)	(0.0167)	(0.0178)	(0.0158)
Part of holding	–0.018	–0.178	–0.00429	–0.0407**	0.00472
	(0.0225)	(0.1620)	(0.0184)	(0.0207)	(0.0187)
Exporter	0.0502***	0.319**	0.0416***	0.0321**	0.0422***
	(0.0172)	(0.1380)	(0.0153)	(0.0153)	(0.0141)
Importer	0.00234	0.142	0.0083	0.0365*	0.0175
	(0.0235)	(0.1850)	(0.0200)	(0.0208)	(0.0171)
Innovations	0.0246	0.109	0.00974	0.0108	0.00239
	(0.0170)	(0.1340)	(0.0150)	(0.0159)	(0.0135)
Public procurement	0.0313**	0.0646	0.0298**	0.0318**	0.0217*
	(0.0156)	(0.1260)	(0.0134)	(0.0144)	(0.0120)
Age	0.000196	0.00542*	0.0002	0.000756**	0.000588**
	(0.0004)	(0.0030)	(0.0003)	(0.0003)	(0.0003)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes
N. obs.	1,586	1,424	1,512	1,336	1,257
Pseudo R2	0.2122	0.2447	0.2215	0.2289	0.2466

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors in parentheses
Source: Authors' calculations

How do the characteristics of regions' integration into GVCs affect the distribution of subsidies?

Table 4 shows the results of the econometric analysis of the factors influencing the allocation of financial subsidies based on various models of GVC participation at the regional level.

In the first group, characterized by extensive backward and forward linkages, support distribution is determined by a company's importer status and role in supplying products for state needs. These regions, specialized in industries like metallurgy and chemicals, likely those support sectors that are vital to the country's economy, such as automotive manufacturing and the military-industrial complex.

Regions in the second group specialize in exporting semi-finished products, with low import dependence due to substantial raw material complexes. Government support allocation is statistically explained by enterprises' export orientation in this group.

In the third group, regions like Moscow, St. Petersburg, the Republic of Bashkortostan, and the Republic of Tatarstan, despite active GVC integration with high export orientation, maintain diversified economies with limited import dependence. Notably, regional support prioritizes small enterprises, reflecting a strategy to nurture SMEs and strengthen value chains. Export orientation emerges as a pivotal criterion for support allocation, indicating profound GVC integration.

Table 4

Factors Affecting Financial Subsidy Allocation at the Regional Level by GVC participation - Firth Logit Regression Analysis

	Group by GVC participation				Group by GVC participation			
	1	2	3	4	1	2	3	4
	Specification without regional dummies				*Specification with regional dummies*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Small	–0.0221	0.337	0.618*	0.201	0.0231	0.345	0.658*	0.173
	(0.4660)	(0.6080)	(0.3570)	(0.2940)	(0.5130)	(0.6190)	(0.3700)	(0.3180)
Medium	0.397	0.242	0.238	–0.0847	0.33	0.439	0.363	–0.184
	(0.6030)	(0.8380)	(0.4790)	(0.3700)	(0.6350)	(0.8470)	(0.4880)	(0.4070)
Large	–0.119	–0.211	0.782	0.0548	–0.127	–0.0261	0.642	0.262
	(0.6070)	(0.9970)	(0.5020)	(0.4320)	(0.6900)	(0.9780)	(0.5110)	(0.4660)
Foreign ownership	–2.279	–0.0357	0.292	0.0406	–2.007	–0.00663	0.00583	–0.462
	(1.6310)	(1.3170)	(1.0370)	(0.5890)	(1.7870)	(1.2000)	(1.0460)	(0.7740)
Public ownership	1.517	2.623	0.787	1.220**	0.904	1.633	0.672	0.825
	(0.9740)	(2.1680)	(1.6540)	(0.5980)	(1.0400)	(2.1080)	(1.6780)	(0.6420)
R&D	–0.416	1.534	0.431	–0.0325	–0.513	1.408	0.509	–0.0144
	(0.5180)	(0.9820)	(0.3660)	(0.3360)	(0.5920)	(0.9480)	(0.3760)	(0.3740)
Part of holding	0.181	0.394	–0.0839	0.0342	0.0519	0.397	–0.374	–0.189
	(0.5040)	(0.6800)	(0.5140)	(0.3490)	(0.5710)	(0.7000)	(0.5370)	(0.3810)
Exporter	0.739*	1.307*	0.392	0.558*	0.443	1.201*	0.365	0.971***
	(0.4340)	(0.6750)	(0.3180)	(0.2950)	(0.5030)	(0.6680)	(0.3360)	(0.3410)
Importer	1.689***	–0.644	–0.111	0.288	1.950***	–0.431	–0.0336	–0.505
	(0.6190)	(0.9290)	(0.3790)	(0.3710)	(0.7330)	(0.9130)	(0.3910)	(0.4870)
Innovations	0.902**	–0.0842	–0.162	0.707***	0.661	–0.21	–0.178	0.857***
	(0.4000)	(0.5480)	(0.3500)	(0.2670)	(0.4640)	(0.5890)	(0.3550)	(0.3090)
Public procurement	0.814**	–0.102	–0.192	0.428	0.904**	0.0341	0.0731	0.42
	(0.3650)	(0.5650)	(0.3230)	(0.2650)	(0.4090)	(0.5700)	(0.3350)	(0.2980)
Age	0.00623	–0.00339	–0.000056	0.00332	0.00594	–0.00462	–0.000798	0.00491
	(0.0054)	(0.0121)	(0.0062)	(0.0057)	(0.0058)	(0.0126)	(0.0064)	(0.0062)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	No	No	No	No	Yes	Yes	Yes	Yes
N. obs.	305	213	435	902	305	213	435	902
Pseudo R2	0.264	0.307	0.131	0.144	0.366	0.320	0.173	0.304
+Robust standard errors in parentheses								
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$								

Source: Authors' calculations

The fourth group includes the majority of administrative divisions, which demonstrate significant integration into backward linkages, focusing on tasks such as localization and import substitution. In addition to supporting export-oriented firms, there is a strong emphasis on fostering innovation-driven companies, although challenges remain in adopting advanced technologies.

Conclusion and Policy Implications

In this study, we assessed the factors influencing the provision of government support to companies at the regional level, focusing on the degree of integration into GVCs through backward and forward linkages in the manufacturing sector. The conclusions can be summarized as follows.

In recent years, export-oriented companies have become a clear priority for regional support, alongside companies fulfilling government contracts. Compared to 2021, there seems to have been a shift in the perceived drivers of development and stability in 2022, with state-owned companies now receiving more support, replacing those with foreign involvement. Amidst shifting international relations, the focus on attracting foreign investors has temporarily moved down the

agenda, prompting a reassessment in response to a new global landscape.

The priorities for regional support depend largely on the level of integration of regional economies, particularly their manufacturing sectors, into GVCs. In regions deeply integrated into the global economy, support tends to prioritize companies acting as "hubs" in global trade, indicating a stronger focus on vertical industrial policies. On the other hand, in regions with limited integration, the focus shifts to supporting small-scale enterprises, with fewer additional priorities, reflecting a more horizontal industrial policy approach.

Additionally, our analysis of regions classified into four types depending on their industrial integration in GVCs highlighted significant differences in the factors influencing regional support. Regions more integrated into backward linkages show a clear preference for supporting innovation-driven companies. This trend is likely linked to efforts around localization and import substitution, especially as GVC integration shifts from final production to component manufacturing. Conversely, regions reliant on forward linkages—exporting raw materials and primary goods, in line with Russia's traditional global trade model—do not show strong preferences regarding ownership structure, company size, or innovation. Support in these regions tends to favour exporters, and the scope for active regional industrial policy appears limited compared to regions with stronger backward linkages.

Regarding the implications of our study's findings for regional policy-making, we will refrain from providing specific recommendations for individual regions. The landscape of regional support is complex and shaped by many factors and evolving dynamics. However, our findings highlight underlying priorities within industrial policy that may not be explicitly stated but become apparent in practice, which opens the door for discussions on initiatives aimed at repositioning Russian regional economies within the global economic framework, given the emerging realities.

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