

# Investigation of the dependence of the significance of the links of the integrative structure on the factors of the institutional environment

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**Abstract.** The formation of network integrative structures at the present stage is associated with the factors of the institutional environment. The article presents the results of a study of the impact of factors of the institutional environment on the stability of the links of the integrative network structure. The research method is based on the search for the correlation dependence of the indicator characterizing the stability of the relationships between subjects and factors of the institutional environment. The results of the study show that the factors associated with financial support, ensuring the availability of credit resources, and providing conditions for preferential taxation have the greatest impact on the stability of the subjects' ties. This situation is directly related to the assessments of the owners and managers of companies included in the network structure of the effectiveness of their activities.

## 1 Introduction

Institutional theory explains the incentive for strategic business integration of Russian business entities by the need for hybrid coordination in a weak external institutional environment, thereby uniting the process of business integration and the institutional environment. So the works of Ryterman R., Recanatini F. [1] and Moers L. [2] present the results of a study on structural changes in the industrial sectors of the transition economy and draw conclusions that the combination of enterprises was considered as a form of relational contracts, the enforcement of which lies in the mutual interest of partners.

Analysis of Russian and foreign research allows us to state that the stakeholder approach generally enriches the methodology of network theory with a complex of various multifactor models that allows to ensure effective strategic management of the polysubject structure, being determined with one or another target vector of development, as well as to select the necessary configuration of the institutional environment that stimulates development industrial production [3, 4, 5, 6]. This design allows you to take a fresh look at the problems of the development of regional industrial complexes, since it forms a dynamic architecture of the innovation ecosystem, in which conditions are created for the

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development and widespread use of innovative technologies and successful business practices.

It should be noted that the Russian practice of stimulating the development of innovations and industrial production is much more institutionalized in comparison with foreign counterparts, these conclusions were made in [7, 8]. The reason for this situation lies in the peculiarities of the development of the transitional economy, the uneven distribution of investment resources between the possible participants in the development of industrial sectors, and the traditional prevalence of administrative mechanisms in management.

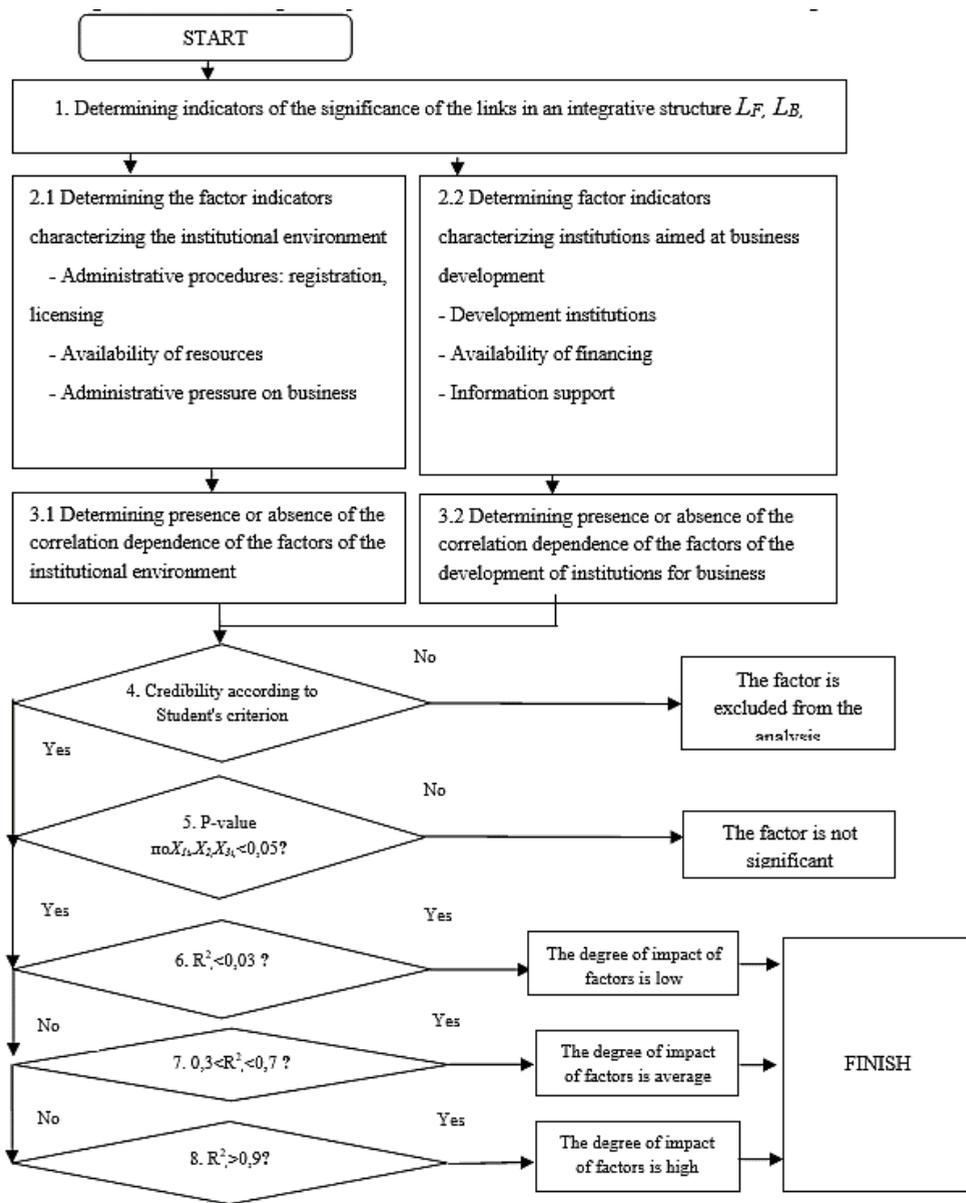
In turn, the institutional approach expands the number of subjects interacting in network integrative structures, uniting key suppliers, partners, consumers, government agencies and supervisory authorities into a group of objects of study [9]. Therefore, it can be stated that institutional theory forms one of the most stable methodologies for managing integrative structures, studying various collective forms of influence, this approach offers promising management tools for organizing networks, be it business areas, innovation systems, industries or clusters.

In our opinion, it also seems appropriate to use the institutional approach to study the processes of mobilizing resources of individual network participants by establishing formal and informal norms, which is a characteristic process for the Russian practice of forming industrial production. As, for example, noted in [10], "development institutions in the most common sense are usually identified with special organizations that differ from others in that they contribute to the allocation of resources in favor of projects to realize the new potential of economic growth of the industry, the region, and the whole country."

## **2 Methods**

As a method of studying the dependence of the formation of stable ties in an integrative structure on the factors of the institutional environment, correlation analysis was used, in which the coefficients reflecting the importance of direct links and feedback were used as the resulting indicators. At the same time, a positive influence corresponds to a direct relationship between the resulting and factorial indicator, and a negative influence corresponds to an inverse relationship between the resulting and factorial indicator.

The algorithm for assessing the dependence of the formation of stable links in an integrative structure on the factors of the institutional environment involves the following main steps, Figure 1:



**Fig. 1.** Algorithm of the methodology for assessing the dependence of the formation of stable links in an integrative structure on the factors of the institutional environment

Defining the coefficients LF and LB, reflecting the importance of direct links and feedback, are given in tables 7 and 8.

Determining factor indicators characterizing the institutional environment and institutions aimed at business development.

Calculating the correlation coefficient.

Further, as a result of testing the data obtained, a validity check is carried out according to the Student's criterion, if  $t > t_p$  the result is considered reliable, if not, then the factor is excluded from consideration.

The characteristics of the institutional environment are recognized as factor indicators, the list of which is presented in Table 2.

### 3 Results

The initial data for the tested models are presented in tables 1 and 2.

**Table 1.** Data on the coefficients of significance of links in an integrative structure from 2015 to 2020

Subjects of the network integrative structure	2015	2016	2017	2018	2019	2020
X11	0,12	0,17	0,18	0,15	0,19	0,2
X12	0,2	0,28	0,16	0,14	0,25	0,32
X18	0,29	0,26	0,32	0,19	0,34	0,2
X22	0,28	0,27	0,28	0,27	0,22	0,25
X31	0,16	0,18	0,19	0,19	0,25	0,35
X43	0,25	0,14	0,29	0,32	0,27	0,25
X44	0,2	0,2	0,2	0,22	0,22	0,24
X45	0,2	0,22	0,23	0,24	0,24	0,25
X47	0,17	0,32	0,35	0,25	0,26	0,22
Y12	0,2	0,23	0,23	0,24	0,2	0,21
Y13	0,13	0,14	0,15	0,16	0,17	0,17
Y14	0,24	0,24	0,24	0,27	0,28	0,35
Y21	0,17	0,18	0,19	0,19	0,2	0,2
Y22	0,19	0,2	0,19	0,21	0,27	0,35
Y23	0,2	0,2	0,24	0,23	0,24	0,23
Y35	0,2	0,2	0,21	0,21	0,2	0,22

To assess the factors of the institutional environment, we used the data of the state of the institutional environment of the Sverdlovsk region, obtained in the course of surveys of business entities. Thus, the formed information base of the research contains records that compare, as a resultant indicator, the coefficients of the significance of the links of the integrative structure, and as factor data, assessing the factors of the institutional environment.

**Table 2.** Values of factor indicators selected for analysis

Indicator	2015	2016	2017	2018	2019	2020
Average time for obtaining a building permit (reconstruction), days	22	23	24	20	20	18
Assessment of the activities of authorities in issuing permits in the field of construction, assessment	3	3,1	3,4	3,5	3,9	4
Assessment of the activities of the authorities on licensing certain types of activities	3	3,1	3,4	3,5	3,9	4
Availability and quality of regional legislation on mechanisms for protecting and supporting investors	5	4,1	4,9	4	3,9	4
Use of investment infrastructure (industrial parks, technology parks, SEZs)	3,7	4,5	3,8	3,5	4,6	4
Assessment of the public-private partnership (PPP) mechanism	4,6	3,9	4,2	3,8	3,7	4
The share of regional tax benefits provided by regional subsidies and project financing from a regional investment fund or development corporation from tax revenues of the region (including personal income tax, excluding transport tax on individuals and property tax of individuals)	3,1	3,1	3,1	3,1	3,1	3,2

**Table 2.** Continued

The share of guarantees of the regional guarantee organization from the tax revenues of the region (including personal income tax, excluding transport tax from individuals and property tax of individuals)	3,1	3,1	3,2	3,2	3,3	3,2
Assessment of measures of state financial support	2,9	3	3,1	3,2	3,3	3,2
Assessment of the availability of the necessary labor resources	3	3,1	3,2	3,2	3,2	3,4
Assessment of the availability of credit resources	3	3,1	3,2	3,2	3,2	3,9

Let us present a summary table of the results obtained, table 3.

**Table 3.** Summary assessment of dependence of significance of links of integrative structure on factors of institutional environment

Factor of institutional environment	X 1 1	X 1 2	X 1 8	X 2 2	X 3 1	X 4 3	X 4 4	X 4 5	X 4 7	Y 1 2	Y 1 3	Y 1 4	Y 2 1	Y 2 2	Y 2 3	Y 3 5
Average time for obtaining a building permit (reconstruction), days	0	0	1	1	1	0	1	0	1	0	0	1	0	1	0	0
Assessment of the activities of authorities in issuing permits in the field of construction, assessment	0	0	1	1	1	0	1	0	1	0	0	1	0	1	0	0
Assessment of the activities of the authorities on licensing certain types of activities	1	0	0	1	1	0	1	1	0	0	1	1	1	1	1	1
Availability and quality of regional legislation on mechanisms for protecting and supporting investors	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Use of investment infrastructure (industrial parks, technology parks, SEZs)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assessment of the public-private partnership (PPP) mechanism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
The share of regional tax benefits provided by regional subsidies and project financing from a regional investment fund or development corporation from tax revenues of the region	1	1	0	0	1	0	1	1	0	0	0	1	0	1	0	1
The share of guarantees of the regional guarantee organization from the tax revenues of the region	1	0	0	1	0	1	1	1	0	0	1	0	1	0	1	0
Assessment of measures of state financial support	1	0	0	0	1	0	1	1	0	0	1	1	1	1	1	1
Assessment of the availability of the necessary labor resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assessment of the availability of credit resources	1	1	0	0	1	0	1	1	0	0	1	1	1	1	0	1

## 4 Conclusions

Summing up the assessment of the impact of the factors of the institutional environment on the stability of the links of the network integrative structure, we can conclude that the group of factors associated with financial support, ensuring the availability of credit resources, and the provision of preferential taxation conditions has the greatest direct impact on these links. This situation is directly related to the assessments of the owners and managers of companies included in the network structure of the effectiveness of their activities. The

factors that simplify access to financial resources form in this group of stakeholders the idea of the effectiveness of the chosen model of activity, the correctness of the formed economic ties and, accordingly, the stability of the network integrative structure.

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## References

1. R. Ryterman, F. Recanatini, Policy Research Working Paper Series, **2539** (2001)
2. L. Moers, Post-Communist Economies, **3** (2000)
3. K. Dembek, J. York, P. J. Singh, Journal of Cleaner Production, **196** (2018)
4. R. E. Freeman, J. McVea, The Blackwell handbook of strategic management **189** (2001)
5. P. Stanwick, S. Stanwick, Edward Elgar Publishing, **44** (2020)
6. S. V. Orekhova, Journal of institutional studies, **4** (2016)
7. E.S. Ogorodnikova, A.E. Plakhin, T.V. Kochergina, T.I.Guseva, M.V. Selezneva, Espacios, **25** (2019)
8. K. Möller, S. Svahn, Industrial Marketing Management, **4** (2009)
9. A. Inemek, P. Matthyssens, Industrial Marketing Management, **4** (2013)
10. E.V. Popov, Regional economics: theory and practice, **4** (2010)