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ESTABLISHING LOGISTICS START-UP COMPANIES: THE ROLE OF INSTITUTIONS

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Abstract: *The article examines how start-up companies in the transportation and warehousing sector can be encouraged by institutions from a macroeconomic perspective. The assumption is that start-ups are more likely to be successful in countries with higher quality institutional systems. In this article, the statistical data of the EU member states are compared using comparative analytical methods, followed by tests using econometric models to evaluate the results. On the one hand, the World Governance Indicator, Human Development Index, and International Property Rights Index of the examined European countries, and on the other hand Hit Horizon and EU startup industry databases are used to answer the puzzle. The assumption is that institutions play an important role in the success of start-up companies in the transportation and warehousing sectors.*

Keywords: *start-up companies, logistics, transportation, warehousing, institutions*

1. INTRODUCTION

Start-up companies have a determining role in the economic growth of the world. The value of start-up companies was 3 trillion USD in 2019 [1]. If we compare the industrial sectors from the number of start-ups point of view it turns out that the transportation and logistics sectors are ranked third after the technology and communication sectors and the finance and insurance and real estate sectors in North America in 2020 [1].

In this article we aim to find evidence how many start-up companies have been established in the EU member states in general and in the transportation and warehousing sectors. As start-ups are fast created and intellectual property, such as patents and statutes are key determining factors of the establishment and the successful implementation of these companies, we analyse whether the quality of governance, HDI and the level of property rights have any influence on the number of start-ups in a country.

The hypotheses are as follows:

1. The quality of formal institutions has positive influence on the number of start-ups.
2. In those countries in which the quality of governance, the HDI and the level of property rights are higher, the number of start-ups is also higher.

2. INSTITUTIONS MATTER

North [2] defines institutions as follows: *"Institutions are the humanly devised constraints that structure political, economic and social interactions. They consist of both informal constraints (sanctions, taboos, customs, traditions and codes of conduct), and formal rules (constitutions, laws, property rights)"*. This definition suggests that institutions have a role

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in the political, economic and social action. In this article we examine a segment of the whole political, economic and social era of the European Union Member States. We focus on how institutions have an influence on start-up companies.

The informal and formal institutions differ in characteristics. Informal institutions are norms, customs, beliefs, traditions and religion. They are spontaneously created and embedded into the actors' beliefs and norms. The roots of the informal institutions are in the actors' individual preferences. These types of institutions change in an endogenous way very slowly (100–1000 years). They cannot be modified by top-down formal rules. If formal rules are not in harmony with the informal institutions, then the formal ones won't become part of the actors' norms and beliefs, so institutional stickiness does not function properly. *Pejovich* [3] describes this phenomenon in his Interaction Thesis:

"If changes in formal rules are in harmony with the prevailing informal rules, the interaction of their incentives will tend to reduce transaction costs in the community (that is, the cost of making an exchange and the cost of maintaining and protecting the institutional structure) and clear up resources for the production of wealth. When new formal rules conflict with the prevailing informal rules, the interaction of their incentives will tend to raise transaction costs and reduce the production of wealth in the community."

Boettke et al. [4] also emphasises the importance of the harmony of informal and formal institutions. They create a model to demonstrate the connection between these two types of institutions. *Boettke e al.* categorizes the formal institutions into three groups (Fig. 1):

1. **IEN institutions** are indigenously-introduced endogenous institutions. IEN institutions are those we associate primarily with spontaneous orders. These embody the local norms, customs and practices that have evolved informally over time in specific places. Language, for instance, is an IEN institution [4].
2. **IEX institutions** are indigenously-introduced exogenous institutions, those we associate with the internal policies created by national governments. For example, federalism in the United States is an IEX institution. Federalism represents a state-constructed institution designed by Americans. Similarly, the British Parliament constitutes an IEX institution. It is a designed institution of British construction for example. [4].
3. **FEX institutions** are foreign-introduced exogenous institutions. FEX institutions are those we typically associate with development community policy. For instance, a legal system change introduced by the development community in a reforming nation would constitute a FEX institution. Although the decision regarding such a change ultimately lies in the hands of the indigenous government, the policy change is chiefly the creation of outsiders and the institutional change is constructed [4]. The supranational level rules of the European Union are examples of these types of institutions.

The *metis* symbolizes the most embedded traditions, norms and beliefs of the society. The further the formal institutions are from the *metis*, the lower the stickiness of institutions is.

This model also emphasizes if there is harmony among institutions, the political, economic and social life performs better, in one word the society's welfare is higher.

Williamson, C. R. [5] also examines and describes the role of institutions on economic performance. The findings of the article suggest that the presence of informal institutions is a strong determinant of development. In contrast, formal institutions are only successful

when embedded in informal constraints, and codifying informal rules can lead to negative unintended consequences.

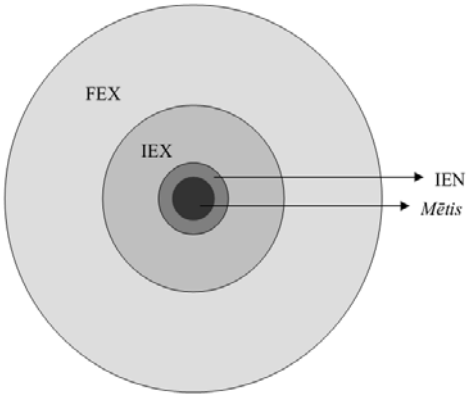

Figure 1. Institutional Stickiness Source: Boettke et al. [4:16]

All the previous literature referred to suggests that the harmony of institutions is determining in economic development and performance as well. Based on the findings we assume that institutions have a determining role in the economic performance such as the establishment of start-ups.

Williamson, O. [6] uses a different model on the one hand to show how various types of institutions depend on each other and on the other hand how fast institutions can change or can be modified by external effects (*Fig. 2.*).

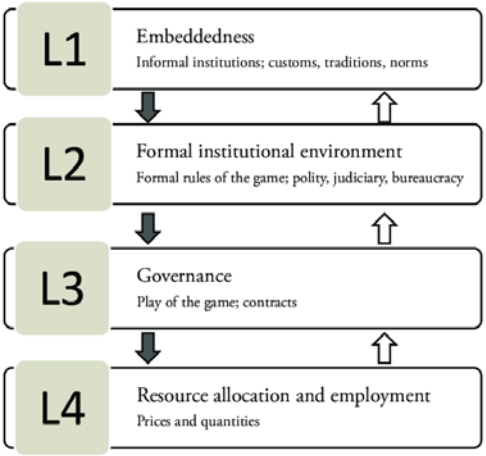

Figure 2. Four Levels of Social Analysis Source: based on Williamson, O. [6:597]

In this research our focus is on the L4 (Company) and L3 (Governance) levels as we analyse whether the quality of formal institutions such as the quality of governance have influence on the successful establishment of start-up companies.

3. METHODOLOGY

In this section of the article first the used methodology, then the compared variables are introduced.

The main methodology is the comparative analysis, which approach puts institutions into its focus (*see previous chapter*).

We cover in the research the data of all the EU member states. The examined variables are as follows:

Human Development Index (HDI) is a measure of average achievement in key dimensions of human development, including longevity and health, knowledge, and a decent standard of living. HDI represents the geometric mean of normalized indices for each of the three dimensions.

The health dimension is measured by life expectancy at birth, and the education dimension by mean years of schooling for adults over 25 years of age and expected years of schooling for children entering school. Gross national income per capita is used to measure the standard of living dimension. A logarithm of income is used in the HDI in order to reflect the diminishing importance of income with increasing GNI. In order to produce a composite index, the three HDI dimension indices are aggregated using geometric means.

HDI can be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with different human development outcomes. These contrasts can stimulate debate about government policy priorities. [7]

Worldwide Governance Indicators (WGI) index covers individual governance indicators for over 200 countries and territories for six dimensions of governance: Voice and Accountability; Political Stability and Absence of Violence/Terrorism; Government Effectiveness; Regulatory Quality; Rule of Law; Control of Corruption. In this research we use only the government effectivness in our analyses. [8]

International Property Rights Index [9]: in a free society based on the creation of a citizenship that controls their own destiny and controls their own lives, property rights are an important institution.

The following are the three core components of the IPRI:

- Legal and Political Environment (LP)
- Physical Property Rights (PPR)
- Intellectual Property Rights (IPR)

The Legal and Political Environment (LP) component provides information about the strength of a country's institutions: the respect for the 'rules of the game' among citizens. This component has a significant influence on the development and protection of physical and intellectual property rights.

The other two components of the Index, Physical Property Rights (PPR) and Intellectual Property Rights (IPR), reflect the two kinds of property rights unequivocal for countries' socio-economic development. The items included in these two categories provide quantitative and qualitative information regarding de jure rights and de facto opportunities in each country. Fig. 3. demonstrates the structure of the IPR index in details.

HIT Horizon database [10] consists of 80 million + records of EU companies. We made filtering for this research as follows:

- companies established from 2021 in the transportation and warehousing sector,
- EU27 countries are only in the focus,

- filtering on number of workers: 5-50 employees.

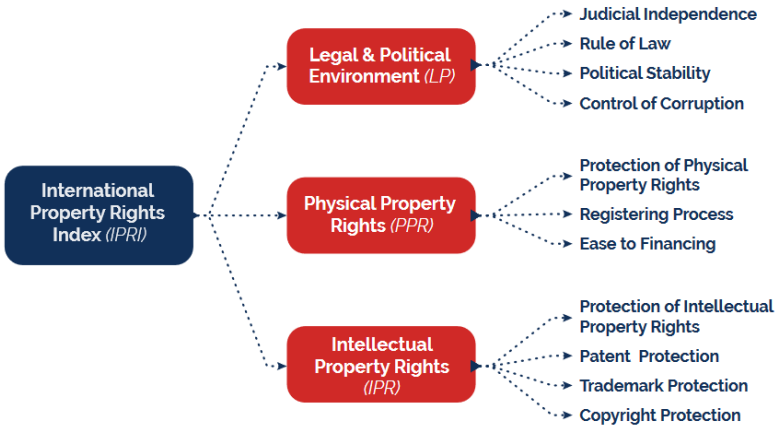

Figure 3. International Property Rights Index Structure [9:6]

Table I.

The Statistical data of EU27 countries on institutions, transportation and warehousing companies and start-ups (own editing)

Country	HDI (UNDP) 2022	WGI Government effectiveness (World Bank) 2022	IPR 2022	Population 2024	Nr. of companies est. in the transportation sector 2021-2023 (HitHorizon)	Nr. of startups (eu-startups.com) 2023
Western European Countries (average)	**0.93**	**90.56**	**7.45**	**27432331.29**	**1256.71**	**27.71**
Austria	0.916	91.51	7.765	8958960	208	14
Belgium	0.937	84.90	7.279	11686140	741	18
France	0.903	83.02	6.783	64756584	815	41
Germany	0.942	88.20	7.469	83294633	3813	67
Ireland	0.945	93.40	7.202	5056935	222	14
Luxembourg	0.930	97.64	7.889	654768	9	2
Netherlands	0.941	95.28	7.777	17618299	2989	38
Eastern European Countries (average)	**0.86**	**65.33**	**5.52**	**12522702.63**	**1181.88**	**4.625**
Bulgaria	0.795	42.92	4.972	6687717	1084	4
Croatia	0.858	70.28	4.916	4008617	301	3
Czech Republic	0.889	81.13	6.401	10495295	605	1
Hungary	0.846	68.86	5.417	10156239	533	5
Poland	0.876	61.79	5.414	41026067	886	16
Romania	0.821	53.30	5.476	19892812	5681	5
Slovakia	0.848	63.70	5.579	5795199	279	2
Slovenia	0.918	80.66	6.002	2119675	86	1
Meditteranean Countries (average)	**0.89**	**73.98**	**5.76**	**21462412.33**	**640.67**	**15.50**
Cyprus	0.896	75.47	5.838	1260138	54	7
Greece	0.887	66.51	4.814	10341277	376	6
Italy	0.895	66.98	5.658	58870762	2337	21
Malta	0.918	76.89	5.778	535064	4	4
Portugal	0.866	80.19	6.214	10247605	367	13
Spain	0.905	77.83	6.245	47519628	706	42
Skandinavian Countries (average)	**0.91**	**32690,00**	**7.05**	**4656633.67**	**251.33**	**10.83**
Denmark	0.948	98.58	7.806	5910913	565	7
Estonia	0.890	89.622	6.731	1322765	206	19
Finland	0.940	96.70	8.173	5545475	165	10
Latvia	0.863	75.00	5.943	1830211	63	9
Lithuania	0.875	79.72	6.048	2718352	33	9
Sweden	0.947	94.81	7.601	10612086	476	11

Startup database on EU27+ countries [11] online database was also useful to get data about how many start-up companies were founded in the EU 27 countries in 2023.

Finally the population of each country was included in the database, after the first tests and correlation analysis of the previously mentioned data.

All these data are summarized in *Table I.* and based on the data we created 4 clusters.

- *Western European countries*: Austria, Belgium, France, Germany, Ireland, Luxembourg and the Netherlands.
- *Eastern European Countries*: Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia.
- *Mediterranean Countries*: Cyprus, Greece, Italy, Malta, Portugal and Spain.
- *Scandinavian countries*: in the comparative analysis based on the data it turned out that the results of the Baltic countries (Estonia, Latvia, Lithuania) show stronger correlation and similarities with the Scandinavian countries (Denmark, Finland, Sweden) so the Baltic and Scandinavian countries are categorized into one group for further analysis.

4. COMPARATIVE ANALYSIS

In this chapter of the article the focus is on the comparative analysis of the EU27 member states. The first step was to calculate for each cluster the averages of the statistical indices examined. Then we ranked the clusters for each index from the highest to the lowest scores. The ranking colour code scheme is the following (*Table II.*).

Table II.

Ranking colour code scheme (own editing)

Rank 1
Rank 2
Rank 3
Rank 4

It is a robust result based on the ranking that the Western European countries perform the best in all the indices.

All three indices on institutional quality (HDI, WGI, IPR) are the second strongest in the Scandinavian countries. However, the number of transportation and warehousing companies established between 2021–2023 are the lowest. The number of newly established start-ups in 2023 is the second lowest among the compared clusters. On the one hand the population, on the other hand the location of these companies can answer this puzzle, but it is highly advised (planned by the authors) to examine it in an in-depth analysis in a separate article.

The Mediterranean countries have weaker institutional system, than the Scandinavian and the Western countries. However, this cluster performs better than the Scandinavian ones in terms of newly established transportation, warehousing and start-up ones. This cluster has half of the start-ups than the Western countries even with a rank 2. The newly founded transportation and warehousing companies are ranked 3. Despite the lower institutional quality these countries perform better than the Scandinavian and the Eastern

European ones. Another interesting result, which should be examined in more detail as indicated by the Scandinavian example.

The Eastern European countries also generate a new puzzle to check. These countries perform the weakest in almost all indices, except the number of transportation and warehousing companies established between 2021–2023. Our assumption for this good result in this latter index depends on the population and the location of the countries, but again further test and verification is needed.

To check the results of the comparative analysis a correlation analysis was ran on the data. The results are as follows:

- the most significant correlation is among the three institutional indices, so if the government effectiveness is higher, than the level of property rights and human development are also higher,
- none of the institutional indices show any correlation with the number of transportation and warehousing companies established between 2021–2023, which is an unexpected result,
- population have moderately positive influence on the number of transportation and warehousing companies established between 2021–2023 and start-ups founded in 2023,
- the HDI index, followed by IPR and Government Effectiveness have moderate, but positive influence on the number of newly established start-ups in 2023.

Table III.

Correlation analysis of the examined Indices (own calculations)

	HDI (UNDP) 2022	Government effectiveness (World Bank) 2022	IPR 2022	Population 2024	est. in the transportation sector 2021-2023	Nr. of startups (eu-startups.com) 2023
HDI (UNDP) 2022	1.00					
WGI Government effectiveness (World Bank) 2022	0.95	1.00				
IPR 2022	0.91	0.97	1.00			
Population 2024	0.38	0.09	0.14	1.00		
Nr. of companies est. in the transportation sector 2021-2023 (HitHorizon)	-0.16	-0.27	-0.08	0.64	1.00	
Nr. of startups (eu-startups.com) 2023	0.86	0.69	0.70	0.79	0.29	1.00

5. CONCLUSIONS

In this article we aimed to test, whether the quality of institutions as a macro-economic driver has influence on the number of newly created start-ups among the EU27 Member States. In the first chapter of the article, we reviewed all those literatures, which demonstrate the importance of institutions for the development of the economy. An overview of the methodology used in this article and the indices that were examined is

presented in the second section. In the main chapter we created clusters, then compared the data of the countries and the clusters. The main findings of the results are:

- the most significant correlation is among the three institutional indices exist (HDI, WGI and IPR),
- none of the institutional indices show any correlation with the number of transportation companies established between 2021–2023, which is an unexpected result.
- the transportation and warehousing sectors of the Scandinavian, Mediterranean and Eastern European countries generated unexpected results and new puzzles to investigate them with in-depth analysis in other articles.
- the HDI index, followed by IPR and Government Effectiveness have moderate, but positive influence on the number of newly established start-ups in 2023, *so the two hypotheses of the article are tested and verified.*

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