

## THE DETERMINANTS OF START-UPS' DEVELOPMENT IN THE CONTEMPORARY ECONOMY

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**Purpose:** The paper aims to identify the determinants of start-ups' development in Poland. The research hypothesis H1 is advanced: Financial capital is a statistically significant factor determining the development of start-ups in Poland. The characteristics of start-ups and factors determining their development are discussed.

**Design/methodology/approach:** A detailed literature review is contained in the theoretical section. The empirical part uses the exploratory factor analysis, which serves to identify key factors and explicate correlations among variables, to verify the research hypothesis. The number of factors is indicated by means of Cattell's method and Kaiser criterion.

**Findings:** The paper contains the results of research into 60 start-up business undertakings. The exploratory factor analysis has helped to define statistically significant factors of start-up development in the Polish economy. Four factors determining this development are identified, namely, financial capital, human capital, legislative and fiscal issues, and networking, with the financial capital being the statistically significant factor of start-up development in Poland.

**Practical implications:** The results can be utilised by start-ups and business environment institutions for a proper selection of factors determining their development.

**Originality/value:** The results of the author's research into 60 start-ups are presented. Due to the specific nature of the group and difficulties reaching it with the traditional sampling methods, the snowball method is applied.

**Keywords:** start-ups, ecosystem, determinants.

**Category of the paper:** research paper.

### 1. Introduction

Organisations in the contemporary economic reality face a turbulent environment. Developments known as 'black swans' (Taleb, 2007), unexpected and sudden events of a substantial scale and huge consequences, have significant impacts on the reality. The COVID-19 pandemic, the military conflict in Ukraine or the climate crisis are some

instances. The unpredictability and opacity of the contemporary world and its growing uncertainty about the future are challenges to people, economy, and politics (Mączyńska, 2020).

Organisations' readiness to grasp the essence of innovation and take advantage of the opportunities offered by technological progress is greatly varied. Digitalisation, automation, artificial intelligence, and machine learning increasingly spread across the world of business. This requires the development of infrastructure and specialist staff competences, however. In a digital enterprise, data collected are used for the purposes of a more efficient and effective management that results in new products and services, new methods and tools of customer support, new professions and business models.

Not each organisation is up to emerging challenges. Competences requisite for development in an environment of interacting real and virtual dimensions are becoming necessary and determine competitiveness (Adamik, Nowicki, 2017). The creation and development of start-ups is an option, as they are oriented towards innovation and thus capable of meeting challenges and developing in difficult conditions. They proved able to respond flexibly, function remotely, creatively adapt their products to customer needs, and seen new markets and business models at the time of the COVID-19 pandemic (Startup Poland, 2020). Research shows (Patel, 2015; Walden 2014, after: Sobczak, Dudycz, 2016, p. 81) merely 10% of start-ups are successful in the market, the rest fail.

This paper aims to identify the determinants of start-up development in Poland. Answering the question, What factors determine start-ups' success the most, is important.

In order to find the answer and verify the research hypothesis based on the literature review, the results of a survey of 60 start-ups in Poland and exploratory factor analysis are utilised. Statistica 12 software and MS Excel 2016 spreadsheets assist with the statistical analyses.

## **2. The characteristics of start-ups and the determinants of their development – literature review**

Start-ups are a relatively new form of economic undertakings. Their emergence and development are connected with the development of information and communication technologies, processes of globalisation and intensifying competition, reduced product life-cycles, and development of entrepreneurial attitudes among the young (Sieradzka, 2021, p. 188). Both Polish and international literature emphasise the absence of a single, universal definition (Said et al., 2022; Ehsan, 2021; Łukasiński, Nigbor-Drózdź, 2022). Environment fluctuations have produced diverse approaches to the definition. Up till 2000, they had stressed the 'market novelty' factor (Carter et al., 1996, Looger, Koo, 2005), however, further analysis pointed to innovation in the face of the increasingly complex requirements of domestic and foreign markets (Krejci et al., 2015; Cho, McLean, 2009). Links between innovation and rapid

growth, connected to rising profits and risks, were highlighted as well (Reis, 2011; Hyytinen, 2015). This changing approach was also a result of dynamically altering customer needs and a necessity of innovative enterprise responses (Kozioł-Nadolna, 2018). ‘The most important strength of a new company is new thinking, which is even more important than agility’ (Hatammimi, Amiranti, 2023, p. 62). Connections among four key, overlapping elements are stressed now: the age of foundation, innovation, growth, and uncertainty/risk. Innovation is the crucial feature distinguishing start-ups, while the other elements, growth and risk, are its products (Ehsan, 2021). The current market requires innovations to be introduced on the basis of ITC technologies (ESM, 2016; Reis, 2017; Startup Commons, 2019; Hatammimi, Amiranti, 2023), which allows for a fast business scalability and new value chain configurations or reconfigurations. Other definitions are highlighted by (Damodaran, 2009): a high growth potential, early stage of development, dependence on various sources of capital, lack of history, and low survival. The following need to be added to this list (Sieradzka, Kaliszczak, 2018): capacity for knowledge, extreme market uncertainty, product or service innovation, scalability, absence of a stable business model, and internet environment.

The time of market operation, which defines an entity as a start-up, is a debatable part. A start-up should be understood as an organization specifically created for the purpose of producing and selling innovative goods and services, as well as testing an innovative business model; the threshold point, depending on the date of organization registration, is determined by the regulations of the country of registration (Ressin, 2022). The period is up to 10 years in most European countries (ESM, 2019).

A start-up is not a small version of a large company. It is a temporary organisation in search of a scalable, reproducible, and profitable business model. At first, the start-up business model is a canvas filled with ideas and guesswork, but it lacks customers and minimal customer knowledge (Blank, Dorf, 2013). Most start-ups are unique organisations that do not fit the development patterns of traditional enterprises. They base on the new business paradigm of multi-level openness and attempts at creating an effective business model (Chrzanowski, Zawada, 2018, p/ 42).

The conditions of start-up development are related to the notion of ecosystem that consists of all entities and organisations interested in the process of initiating innovation and transforming it into prosperous business undertakings. Start-up ecosystems are a union of localized cultural outlooks, social networks, investment capital, universities, and active economic policies that create environments supportive of innovation-based business (Spigel, 2017). A normal functioning of start-up ecosystems is largely dependent on adequate regional economic policies. The provision of an appropriate institutional and regulatory background fosters the development of these undertakings (Bigos, 2018). Easy access to the sources of financing is pre-requisite to start-up development in an ecosystem, though support from entities like venture capital funds or business angels is important to firms at the initial stages of development, too, since the former offer not only capital commitment but also mentoring,

business contacts, management experience, etc. (Lipińska, 2018). Acquiring capital is the chief challenge to start-ups (Muathe et al., 2022, p. 394).

Exo- and endogenous factors are distinguished among the conditions affecting the development of start-ups. The former include (Kuranowski, Szymańska, 2018): legal aspects, government programmes, financial support, cooperation with science, diffusion of innovation, institutions of business environment, sectoral elements and broadly-defined enterprise collaboration, regional, national and foreign markets, the impact of globalisation on customers and competition, social and cultural (demographic and ecological) factors, the protection of intellectual property (patents, licences), and the turbulent environment where start-ups operate. The endogenous factors comprise (Kuranowski, Szymańska, 2018): human resources, the flexibility of organisation, its structures and resources, business experience, capacity for adapting innovations from outside and from R&D, the flexibility of financial and tangible capital, ability to implement innovation, corporate culture, ability to take risk, the climate of innovativeness, the skill of cooperation, and rapid response to changes. In turn, R. Geibel, M. Manickam (2015) define 25 factors of start-up success, grouped into three categories: 'external factors', 'internal factors', and 'support from incubator/accelerator'. The first group encompasses: team, work culture, co-founders, organization structure, exit strategy, marketing strategy, customer network, product, ability to scale, company pitch, balancing work and family life. The external factors include: government policies, political stability, location, access to talent, new market access, access to existing market, competitors, and prior experience. Mentorship, expanding network connections, financial funding, tax, legal, business etc, support, infrastructure, and workshops/events are listed as part of group three.

The studies of (The Global Startup Ecosystem Ranking, 2022; The Global Startup Ecosystem Report, 2022) show the Silicon Valley (US) ranks top among the best start-up ecosystems worldwide, followed by London and New York, appreciated in a range of categories, from financing, business contacts to development opportunities. The Israeli start-up ecosystem stands out, too, as one of the best clusters of not only technology businesses.

Research into the largest global start-up ecosystem, the Silicon Valley, has demonstrated some factors driving its success, including (Piscione, 2013): the presence of scientific institutions, multicultural environment of experienced workers and investors, addressing risk and failure in business operations, appropriate legal regulations, a culture of knowledge sharing, and a strong representation of venture capital and business angels. The analysis of the New York start-up ecosystem has identified the following key factors of its success, in turn (Cometto, Piol, 2013): an easy access to financial capital, an important role of the business angel network, a tolerance of high risk and business failure, and an open community based on sharing and well-developed networking. The study of the Israeli start-up environment by F. Kohn et al. (2015), on the other hand, has proved the following play a substantial role in the success of firms in a given ecosystem: the experience of entrepreneurs, the diversity of a founding team and good communication, military service, the acceptance of risk and failure, capital access, high technological competences, staff education, openness, and cooperation.

Entrepreneurial ecosystems involve entities that make up the quadruple helix model, which determines the success of a given economic undertaking. Cooperation and mutual links between the four model elements (Ziakis et al., 2022): science institutions (including universities), government, industry, and the public, are particularly important in the case of start-ups, characterised by a high innovativeness and global reach. The following factors determining the development of start-ups in Greece are indicated (Ziakis et al., 2022):

- education and research - education, and especially start-up business training, is an important factor contributing to the profitability of a start-up business; start-uppers who have greater access to knowledge from the beginning are more likely to survive,
- human capital - choosing the right human resources and their loyalty to a start-up business are highlighted as the most important factors,
- finance and funding - financing is a crucial factor not only in the early phases of operation, but it greatly affects the profit of a start-up business; the impact of venture capital on innovation activities and the success of start-ups is particularly important and, in fact, of a long-term nature,
- government - the state can be involved in some areas of high-risk activities where the private sector consistently avoids participating. Governments can contribute by highlighting successful business models, removing bureaucratic barriers to start-ups, provisioning on tax incentives on R&D expenditures, and mitigating the social stigma of failure,
- business support and connectedness - the performance of start-ups is directly influenced by the quality of their networks and their ability to exploit the resources they have access to through these relationships,
- entrepreneurial culture and incentives for start-up creation - the social context in which the start-upper lives, works, and shapes both his business culture and business motivations is crucial.

An analysis of the maturity of the start-up ecosystem in Poland (Deloitte, 2016) covered five crucial areas: financing, legal regulations, human and social capital, and institutional environment, Poland scores 1.93 on a 1-4 scale. The results have shown social capital, financing, and human capital are the weakest developed areas in Poland (1.5, 1.68, and 2.27, respectively). The standards of legal regulations (2.55) and institutional environment (2.5) score far better.

A study conducted by the Polish Agency for Enterprise Development (PARP 2019) in 2017-2019 demonstrated excessive bureaucracy, high fiscal burden, lack of qualified personnel, and problems obtaining external funding are the greatest impediments to the development of young, innovative firms in Poland. Research by the Startup Poland foundation (2021) lists securing funding for the successive stages of development, high costs of employment, organisational problems of start-up expansion, rapidly changing and vague

legislation, as well as operational formalities as limitations to start-up development. An examination of start-up development conditions in north-eastern Poland (Kowalewski, 2018) points to financial limitations and a lack of business experience as key internal barriers. The internal factors obstructing start-up development include organisational and administrative issues and deficits in the regional job market, as evidenced with problems hiring adequately qualified workers.

The systematic research of Startup Poland foundation implies more than 76% operate as part of the research and development model (Białoń, Werner, 2018), proof of a great importance of new technologies to their development. A study by R. Sobczak, H. Dudycz (2016) indicates three factors that, depending on the way they are organised, contribute to either the success or failure of a business – these are: product, team, and financing.

This literature review helps to identify some characteristics of start-ups and key determinants of their development. Therefore, the research hypothesis H1 is posited: Financial capital is a statistically significant factor determining the development of start-ups in Poland.

### **3. Methods**

A survey was conducted to explore the characteristics and determinants of start-up foundation in Poland and verify the research hypothesis. Due to the specific nature of the group and difficulties reaching it with the traditional sampling methods, the snowball method is applied.

As no standard definition of start-up is offered by the literature, the one suggested in the Polish Agency for Enterprise Development's report (PARP, 2017) is adopted, as it seems relevant to the Polish realities. There, the start-up is considered 'an entity represented ... by an individual at the stage of starting a firm or running it for up to 3.5 years using technologies/ work methods available in the market for no longer than 5 years to manufacture their products/services'. This study was carried out between November 2022 and March 2023.

The process began with the choice of a start-up to act as the initial respondent. That active representative of a local start-up environment was the key source of information and contacts. The information received in this way helped to identify more start-ups as possible participants in the study. The data were obtained using the method of Computer-Assisted Telephone Interview (CATI).

As the study progressed, the representative start-ups were requested to take part in the survey by completing an original questionnaire using a seven-point Likert scale. The questionnaire consisted of 20 determinants to analyse some aspects of start-up foundation. As the data were gathered by means of the snowball method, special attention was paid to the diversity of start-up characteristics to produce a representative sample. That process continued until a saturation point, where more identified start-ups failed to contribute any significant new information.

On obtaining responses from 60 start-ups, data analysis commenced. The multidimensional nature of the study allowed for a variety of analytical techniques, such as an analysis of descriptive statistics and factor analysis, in order to grasp the patterns and relationships among the determinants and their effect on the foundation and development of start-ups in Poland.

Exploratory factor analysis serves to verify the hypothesis proposed. It helps to identify variables referred to as factors, which explicate correlation patterns within the sets of observed variables. The number of factors is indicated by means of (StatSoft, 1997):

- Cattell's method – the scree graph is linear; in order to select the number of components (factors), the point is sought where the graph is no longer steep (no longer a scree). The components above that point are the quantity of factors to be distinguished as part of the analysis,
- Kaiser criterion – it's assumed that if more than one component (factor) explains more variance than a single variable, or where the eigenvalue is more than 1, that component should be adopted as part of the factor solution.

Statistica 12 software and MS Excel 2016 spreadsheets assist with the statistical analyses.

## 4. Results

This section presents the results. 20 observable variables are analysed, assessed by the respondents for impact on start-ups' foundation and development. Descriptive statistics for each variable are discussed and interpreted for a better understanding of the sample's characteristics.

The values of such descriptive statistics as the mean, standard deviation, and the coefficient of variation are the tools of analysis designed to identify both the major determinants, ranked higher by the respondents, and those less appreciated. The analysis shows the diversity of opinions in the group and identifies the aspects crucial to the process of start-up creation in Poland.

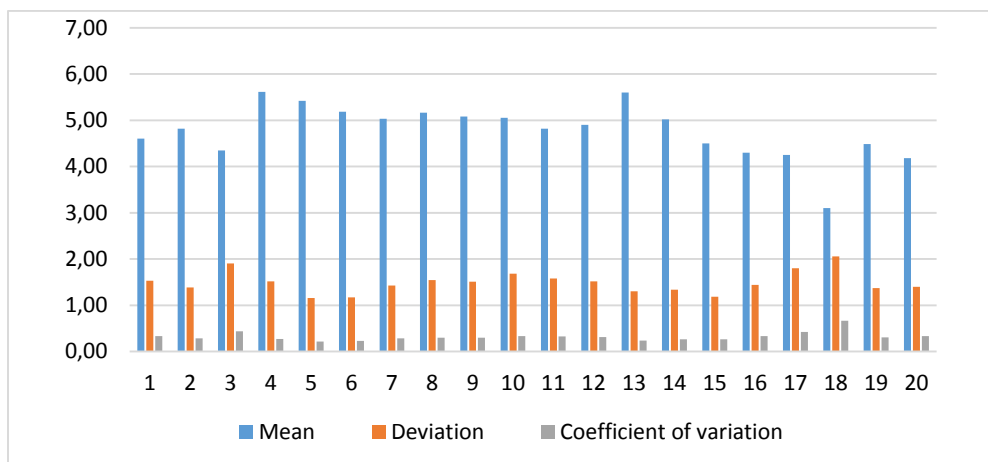
The discussion of results for each of the 20 observable variables helps to better grasp their significance with regard to the phenomenon under analysis. The analysis will contribute to a view of the determinants key to innovative business activity in Poland and will help lay out some guidelines for a potential development of the start-up environment in future.

**Table 1.**

*The descriptive statistics of observable variables describing the determinants of start-ups' development*

Variable number	Variable name	Descriptive statistics		
		Mean	Deviation	Coefficient of variation
V1	Crowdfunding	4,60	1,53	0,33
V2	Venture Capital/Private Equity	4,82	1,38	0,29
V3	Incubators&Accelerators	4,35	1,90	0,44
V4	New technologies	5,62	1,52	0,27
V5	R&D institutions	5,42	1,15	0,21
V6	Seminars	5,18	1,17	0,23
V7	Legislation	5,03	1,43	0,28
V8	Taxation Policy	5,17	1,54	0,30
V9	Business partners	5,08	1,51	0,30
V10	Networking with industry	5,05	1,68	0,33
V11	Cooperation with universities	4,82	1,58	0,33
V12	Start-up events	4,90	1,51	0,31
V13	Human capital competencies	5,60	1,30	0,23
V14	Entrepreneurial education	5,02	1,33	0,27
V15	Business mentors	4,50	1,19	0,26
V16	Bank loan	4,30	1,44	0,34
V17	Innovation Contests	4,25	1,80	0,42
V18	Public funding	3,10	2,06	0,66
V19	European Union funding	4,48	1,37	0,31
V20	Business Angels	4,18	1,40	0,33

Source: The author's own compilation.



**Figure 1.** The descriptive statistics of observable variables describing the determinants of start-ups' development.

Source: The author's own compilation.

An analysis of observable variables in Table 1 and Figure 1 suggests nearly all mean evaluations of all the determinants of start-up foundation in Poland were greater than 4 and ranged  $<3.10; 5.62>$ . This shows all these variables were assessed as 'high and consistent'. In general, the respondents appreciated these determinants.



The mean evaluations were maximum for V4 (New technologies), with the mean of 5.62. That was followed by V13 (Human resources competencies) and V5 (R&D institutions), rated at 5.60 and 5.42, respectively. These determinants were seen by the respondents as the most important to the start-up creation.

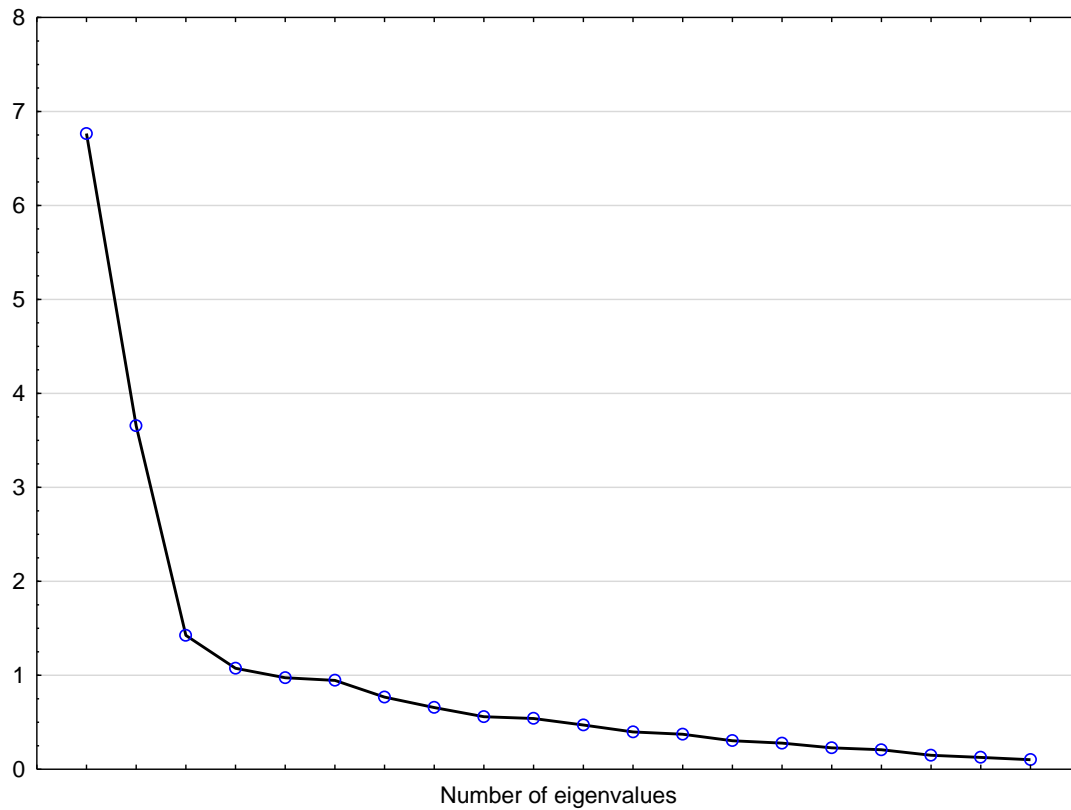
As far as more variable components are concerned, the variables like V3 (Incubators & Accelerators), V17 (Innovation Contests) and V18 (Public funding) can be underlined with their higher standard deviations and coefficients of variation. This may suggest the responses relating to these determinants were more varied, that is, not all the respondents were of identical opinions about them.

Variables V18 (Public funding) and V20 (Business Angels) had the lowest mean evaluations of 3,10 and 4,18, respectively. This suggests that group of respondents see public financing and support from investors – business angels as having little impact on the creation of start-ups.

The variables whose coefficients of variation were relatively low, such as V5 (R&D institutions), V6 (Seminars) or V13 (Human resources competencies), deserve some attention, too. The respondents' opinions about them were more consistent and less varied.

These results indicate various determinants of start-up foundation received different respondent evaluations. Some were more appreciated and assessed more consistently, with others receiving more varied opinions of the research sample. This may prove useful information for those dealing with start-up development and making decisions to allocate resources and support for the various aspects of these economic undertakings.

Exploratory factor analysis was then undertaken to clarify the mutual relationships among the observable variables. To determine an appropriate number of factors, Cattell's scree test was applied to analyse eigenvalue reductions and the Kaiser criterion to address only the factors with eigenvalues above 1. A drop to the right of the scree point indicated the presence of the so-called 'factor scree', which helped to determine the number of factors subject to further analysis.



**Figure 2.** The scree diagram of eigenvalues for the factors describing the development of start-ups.

Source: The author's own compilation.

Figure 2 illustrates a steep declining curve turning into a mild factor scree with four distinct factors. This means the successive factors contain but little information. They have low eigenvalues and are thus rejected. A model of four factors is selected for the continuing analysis, therefore. Table 2 contains a matrix of eigenvalues for the selected factors and Table 3 a matrix of factor loads for the factors describing the start-up development, i.e., a correlation between the observable variables and the factors introduced to the model. 0.7 is assumed as the minimum correlation qualifying as important.

**Table 2.**

*A matrix of eigenvalues for the factors describing the determinants of start-up development*

Factor	Eigenvalue	Percentage of total variance	Accumulated eigenvalue	Accumulated percentage
1	6.77	33.83%	6.77	33.83%
2	3.65	18.27%	10.42	52.10%
3	1.42	7.12%	11.84	59.22%
4	1.08	5.38%	12.92	64.60%

Source: The author's own compilation.

Table 2 shows the subsequent eigenvalues or parts of the variance explicated for the individual three factors are as follows:

- for factor one, 6.77, or 33.83% of the total variance,
- for factor two, 3.65, or 18.27% of the total variance,
- for factor three, 1.42, or 7.12% of the total variance,
- for factor four, 1.08, or 5.38% of the total variance.

The accumulated eigenvalue for the four factors is 12.92. This means such a system of factors explains as much as 64.60% of the total variance.

**Table 3.**

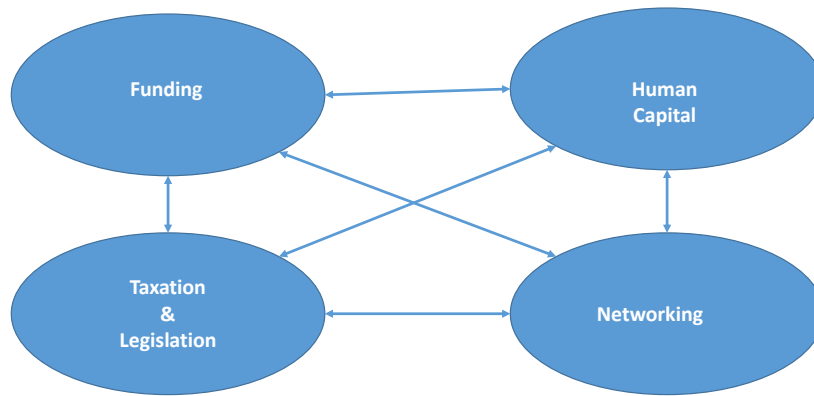
*A matrix of factor loads for the determinants of start-up development*

<b>Factor loads (normalised Varimax)</b>				
<b>Key components (The loads identified are greater than 0.7)</b>				
<b>Variable</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>	<b>Factor 4</b>
V1	<b>0.85</b>	-0.12	-0.28	-0.12
V2	<b>0.87</b>	0.20	-0.06	-0.08
V3	<b>0.77</b>	-0.33	-0.12	-0.08
V4	-0.22	0.27	0.54	0.11
V5	-0.11	0.66	0.08	0.40
V6	-0.02	0.62	0.09	0.20
V7	-0.07	0.15	<b>0.82</b>	0.17
V8	0.09	0.17	<b>0.81</b>	0.04
V9	0.04	0.19	0.36	0.68
V10	-0.01	0.17	0.01	<b>0.84</b>
V11	0.06	0.68	0.16	-0.06
V12	-0.09	0.38	0.16	0.28
V13	-0.25	<b>0.75</b>	0.23	0.08
V14	-0.33	0.57	0.39	0.10
V15	-0.13	<b>0.83</b>	0.04	0.06
V16	<b>0.77</b>	-0.23	0.10	0.14
V17	<b>0.84</b>	-0.16	0.01	0.02
V18	<b>0.78</b>	-0.26	-0.12	-0.10
V19	<b>0.84</b>	-0.04	0.02	0.03
V20	<b>0.85</b>	0.06	-0.01	0.02

Source: The author's own compilation.

Table 3 implies:

- the first factor is loaded with a total of 8 variables numbered: V1-V3 and V16-V20,
- the second factor is loaded with two variables numbered V13 and V15,
- the third factor is loaded with two variables numbered V7 and V8; while
- the fourth factor is loaded with one variable, V10.



**Figure 3.** The factor-based model of start-up development.

Source: The author's own compilation.

The factor analysis supplies some important information on the interrelations among the observable variables with regard to the determinants of start-up emergence. The factor loads, normalised by means of Varimax, help to identify which variables are significantly related to the particular factors and to what degree.

As suggested by the literature, the factor names are derived from the variables of maximum factor loads. Thus, the first factor is named 'Funding', factor 2 – 'Human Capital', factor 3 – 'Taxation & Legislation', and factor 4 – 'Networking'.

#### Factor 1: Funding

The variables with strong positive loads in factor 1: V1 (Crowdfunding), V2 (Venture Capital/Private Equity), V3 (Incubators&Accelerators), V16 (Bank loan), V17 (Innovation Contests), V18 (Public funding), V19 (European Union funding), and V20 (Business Angels). The results indicate factor 1 may be interpreted as 'Funding'. The high loads of these variables suggest start-ups taking advantage of crowdfunding, VC/PE funds, bank loads, incubators, accelerators, and public financing, EU funds, business angel capital or innovation contests are strongly linked to this factor.

#### Factor 2: Human capital

The variables of significant positive loads in this factor: V13 (Human capital competencies) and V15 (Business mentors). They point to the benefits from the intellectual capital of founders, workers, and investors.

#### Factor 3: Taxation & Legislation

Relatively high loads in factor 3 are exhibited by variables V7 (Legislation) and V8 (Taxation Policy). The factor can be named 'Taxation and Legislation', indicating that good legislation applicable to the foundation and running of business and to taxation is an important part of start-up development in Poland.

#### Factor 4: Networking

The variable of a very significant positive load in factor 4 is V10 (Networking with industry). This factor concentrates around business networks and contacts that can affect the growth and development of start-ups through knowledge sharing and collaboration with the industry.

Some variables display significant loads on a single factor only, which may point to their clear links with a given aspect of start-up development. Some variables may affect more than one aspect of start-up emergence, which is a valuable finding.

In general, the analysis of factor loads helps to identify crucial areas and determinants that influence the process of start-up creation and development in Poland. The clear patterns of relationships among the variables help to understand which factors are important to the development of innovative enterprises in Poland.

## 5. Discussion

Specialist literature points to a number of factors influencing the development of start-ups. The sources of funding are among the key factors of start-up operation. Ziakis (2022) points out the lack of funding and the high dependence of start-ups on personal capital jeopardize their success and viability. At the same time, their level of co-operation with other institutions is considered unsatisfactory, with the private sector dominating and research institutes playing a limited role. Potdar et al. (2019) stress a special role of financing business undertakings at the early stages of development. Venture capital and business angels have the greatest effect on promoting innovative entrepreneurship (Johnson, Sohl, 2012). The role of crowdfunding is rising (Sieradzka, 2023). Cash flows and holdings contribute emphatically to the productivity and profitability of businesses (Dimitropolous, 2019).

Chorev and Anderson (2006) highlight the role of the team, its attitudes and skills. They found that success factors could be grouped as critical or important. The first group categorised the idea, strategy, the core team's commitment, expertise, and marketing as critical. Important factors were deemed to be management, customer relationships, and research and development. The least important factors proved to be those external to the firm, i.e., the economy, politics, and the general business environment. The major role of human and intellectual capital in the development of innovative undertakings is also emphasised by Tavorn, Chandrachai (2020). Unger et al. (2011) point out human capital helps owners to obtain other resources, including financial and material capital, and enhances owners' capacity for discovering and using business opportunities. Mai et al. (2022) underline the important role of workers' and management's competences in the process of organisational learning, which enables a permanent and sustainable development. A study of generation Z (born in 1995-2012) in Poland, carried out by Łukasiński and Nigbor-Drózdź (2022), suggests the young (those aged 20-40 are the most numerous among start-up founders – Raport Polskie Startupy, 2022) regard intellectual and financial capital, new technologies, and collaboration with corporations as having maximum impact on start-up development.

Ziakis, Vlachopoulou, Petridis (2022) stress the role of business environment institutions in start-up development. The most significant issues affecting the successful development of start-ups are government incentives, such as tax incentives and the acceleration of starting procedures, availability of funding opportunities, connectivity of stakeholders, entrepreneurship education, previous start-up experience, incubator support, and mentoring. Incubators (McAdam, 2008) and science and technology parks play a special role (Ratinho, 2010) in supporting the development of young, innovative economic undertakings.

## 6. Summary

Literature fails to offer a standard approach to either a definition or conditions of start-up development. A range of authorial definitions identify it with some characteristics including innovation, a fast rate of development, the absence of a business model or an early stage of development. Methodological problems arise not only from the lack of definition but also the different treatments of start-ups by various authors. In addition, my literature review discloses a great number of factors determining start-up development which are differently classified. Endogenous and exogenous factors are cited most commonly, related to the operation of these enterprises and to broadly-defined business environment institutions.

The author's research has identified four factors determining the development of start-ups in Poland. These include: financial capital, human capital, legislative and fiscal issues, and networking. Financial capital is the most statistically significant factor.

The conclusions of my study are important to an understanding of the processes of start-up creation and development in Poland. The results help to verify the research hypothesis and supply valuable information to the start-up ecosystem, including the institutions supporting the development of new enterprises. The snowball method proves a valuable tool of research into hard-to-access social groupings that enables more in-depth and diverse perspectives.

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