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EXECUTIVE SUMMARY OF THE THESIS

Taxonomy of Platform-based New Ventures in an Emerging Industry

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1. Introduction

The nature of platform new ventures, and their role in emerging economies, is a matter of intense debate. Since the Eighties, platforms have started to play a key role in various industries, giving rise to different meanings of the platform concept depending on the field of application. Born as a strategy for a company to reduce the time to market of an innovative product, platforms first enlarged their boundaries to a wider set of players belonging to the same industry and then started to represent infrastructures able to connect different sides of the market. Nowadays, thanks to the pervasive adoption of digital technologies, platforms can benefit from the collection of significant amount of data and connect the actors involved in a more efficient way. For these reasons, an increasing number of new ventures is exploiting this business model, thanks to its potentially high scalability and the opportunity to win the market if successfully implemented. Therefore, platform business model features can be effectively exploited in most of the emerging industries characterized by high level of digitalization. The platform business model is intended as the ability of a company to provide an infrastructure able to connect different sides of the market, exploiting network effects. Emerging industries are those domains characterized by high level of innovation and the lack of a dominant design, such as the new space economy, which can be considered as the evolution of the traditional space economy. In particular, starting from the beginning of the twenty-first century, the space economy has seen an increasing amount of investments and participation from the private actors, in an industry typically characterised by the proprietary presence of governments. This gave rise to the introduction of a series of activities, all encompassed in the new space framework, that often leverage on new technologies, among which machine learning and AI. The increasing relevance of platforms business models and the attractiveness of the new space economy generate the need of a comprehensive understanding of platforms behaviours in this specific context.

However, the existing literature does not include provide any theoretical knowledge about the main archetypes of platforms operating in the new space economy. Therefore, the objective of the research is the development of a taxonomy of platform business models in the new space economy. The main contribution of this study is the provision to both regulators and investors of an exhaustive framework able to identify the most significant archetypes of new space economy platforms, resuming their related key characteristics. Following the method suggested by Nickerson et al. (2013) [1] for the development of a taxonomy in the information systems domain, a cluster analysis on 134 European new space economy platform start-ups was carried out. This process led to the identification of five clusters, namely "Scientific and technological foundation platforms", "New space economy cloud platforms", "Crowdinvesting platforms for SDG", "Public-private information platforms", and "Space enabled service marketplace platforms", that represent the most widespread typologies of platforms operating in the context. The objective of this taxonomy is therefore to provide a common terminology that all stakeholders can refer to, in order to facilitate the diffusion and the adoption of certain standards within the new space economy.

2. Literature review

Following the evolution over the years of platforms' connotation, the most relevant stream of the underlying literature was consulted to collect a set of the most cited definitions and to obtain information on their crucial aspects. Starting from platforms' meanings, the chapter addresses the range of shades that the term may assume according to the field of application. Subsequently, the literature review focuses on the platforms' archetypes, the relative key aspects, and their scalability, that represent the basis for the following analysis. Once analysed platforms in their entireness, it is necessary to perform a literature review in the field of emerging industries. This operation allows a better understanding of the theoretical frameworks and notions regarding this specific type of industry, that includes the New Space Economy, which represents the empirical context of the underlying study.

The term platform belongs to different fields, ranging from the IT industry to the management domain and its meaning depends on the scope of the analysis. In particular, a preliminary way to classify platforms comes from the different perspectives belonging to two streams of literature, the engineering-design and the economic views, that, over time, have deeply analysed the underpinning structure and the functioning of platforms throughout different lenses. Following a chronological order, the first concept of platforms belongs to the engineering-design view, according to which platforms act as a basis for the delivery of derivative products and services. Indeed, Wheelwright and Clark (1992) [2] define platform as products able to satisfy customer needs by adding and removing features. Furthermore, according to Gawer et al. (2020, p. 7) [3], platforms are "foundation technologies with modular architectures that facilitate innovation through open interfaces". The innovation process can either involve only the platform owner or a wider set of actors called complementors. This distinction allows to identify two different platforms' archetypes, respectively internal platforms to enhance new product development and industrywide platforms. However, the latter have the role of conjunction point between the engineering-design and the economic view, according to which, on the other hand, platforms are usually referred to as two-sided or multi-sided markets. The economic stream sees these platforms as facilitators between different kinds of agents that, without platform interactions, could not execute transactions (Armstrong, 2006 [4]; Evans et al, 2008 [5]; Rochet and Tirole, 2003 [6]). They are mainly characterized by network effects between the two - or multi - sides of the market at a point that, according to Rysman (2009, p. 127) [7], "the literature on two-sided markets could be seen as a subset of the literature on network effects". This stream of literature allows to establish a third archetype of platforms called two-sided (multi-sided) market. After the evaluation of several definitions, the reference for the rest of the analysis is the one provided by Cennamo (2023, pp. 5-14) [8], according to which a platform "acts as a data hub channelling and integrating information from/to users and from/to multiple connected products and services, and as market infrastructure connecting users and suppliers of goods […] platforms are the "new" market infrastructures that enable firms' interconnected products and services to create and deliver value to final users […] Platforms can vary in their strategies to attract on the different sides of the platform market and activate and leverage the indirect network effects". A common trend affecting the three platform archetypes is represented by the digitalization, a phenomenon arisen from the servitization process, described as the introduction of complementary services to an already existing core product to widen and differentiate the offering of a firm (Vandermerwe and Rada, 1988 [9]). Nowadays, therefore, the literature often refers to platforms as digital platforms which "serve as a standardized digital interface and utilize digital technologies to facilitate interactions between different parties" (Chen et al, 2022, p. 149 [10]). With the aim of successfully integrating the digital servitization model and taking advantages from its implementation, companies have to leverage on software capabilities and integrate in their business model the continuous acquisition and processing of data (Hasselblatt et al, 2018 [11]). Digital servitization can contribute to develop a collaboration ecosystem among firms which are based on a product-service-software offering and use autonomous systems. Smarts solutions require to involve all actors involved in the ecosystem, starting from the manufacturers, final customers and distributors. Consistently, a subset of the literature interpretates platforms as an interconnected set of actors, including the platform itself, that collectively generate an ecosystem. Contrary to traditional business models, that are based on the internal operative control, platform ecosystems leverage the coordination of several external sources of value to reach the final customer. Without knowing exactly what the final product will be, the platform owner provides a modular structure, on which complementors build the goods that will reach the final customer (Gawer and Cusumano, 2014 [12]). Another perspective on platform ecosystems encompassed by the literature interprets platforms as meta-organizations or as organizations of organizations. In line with this stream of researchers, platform ecosystems are considered as a combination of organizations and markets (Gawer, 2014 [13]; Kretschmer et al, 2020 [14]; McIntyre et al, 2021 [15]). According to Kretscmher et al. (2020, p. 148) [14], platform ecosystems "can be viewed as hybrid structures between organizations and markets, providing a mixture of market-based and hierarchical power, and a mixture of market-based and hierarchical incentives". This view of platforms ecosystems considers the platform owner as both the provider of the common set of interfaces upon which the complementors deliver innovative goods, and the market infrastructure where these products are sold by complementors to the final customers. Moreover, platform ecosystems are characterized by a high level of scalability, defined as "the extent to which a business model design may achieve its desired value creation and capture targets when user/customer numbers increase and their needs change, without adding proportionate extra resources" (Zhang et al, 2015, p. 3 [16]). Therefore, a scalable business model is able to increase its outputs and profitability without sustaining consistent additional costs and preserving the quality of its offering with a rising number of users. According to Arthur (1989) [17], there are four main factors behind the scalability of a platform business model, i.e, network externalities, production economies, informational increasing returns and technological interrelatedness, and, according to Zhang et al (2015) [16], customer identification, customer engagement and value chain linkages are the three main aspects of a business model upon which scalability is built. Platforms and their digital features can facilitate companies to scale up their scope and size since they already exploit network externalities. Moreover, according to the level of dematerialization of the processes, the customer base and the value generation can be respectively increased and enhanced by incurring different amounts of marginal costs and therefore achieving different levels of scalability.

Focusing on the second topic of the chapter, it is possible to highlight that, alongside traditional industries, the economic landscape is characterized by the presence of emerging industries often associated with innovation, creativity and entrepreneurial development that are fundamental for the economic growth (Feldman Lendel, 2010 [18]; Tanner, 2014 [19]) and for a transition to sustainability (Binz and Truffer, 2017 [20]). The definition of emerging industry is not unique, and can be explained from different points of view, namely the life-cycle approach, the evolutionary economic geography approach and the systemic approach. According to the former, emerging industries are industries in the earliest stage of development. A similar definition is given by Phaal et al. (2011) [21], who state that industry emergence is represented by the first phases of an industry, characterized by a small population, the lack of a dominant design and product architecture, and frequent innovation. It is important to highlight that institutions can play a significant role in supporting the development of emerging industries providing knowledge and other enabling factors. Finally, new industries can be generated by the entry of two different types of firms, the de alio and de novo. De alio companies are the ones which already operate in existing industries and decide to enter in new ones, whereas de novo businesses are those that start their economic activities directly in a novel context. The literature about platform is wide and encompasses all key features of this business model, however there is a gap about their implementation in emerging industries that represent a profitable context for platforms. Indeed, the introduction of digital technologies and the relevance of information can benefit platforms fostering the introduction of innovation to the market.

3. Research Design

Platforms and their characteristics have been widely analysed by the different streams of the literature as well as the application of the business model in more traditional industries. However, it is possible to identify a gap in the literature about the ability of platform business model to generate value in emerging industries, such as the new space economy. The aim of the study is therefore to understand the archetypes of platforms operating in this specific context, focusing on their main characteristics and the different levels of scalability in the new space economy. In order to reach this objective, a taxonomy of platform business model in the new space economy is developed. To classify the archetypes of platforms operating in this context, a cluster analysis is carried out. This approach is the most suitable since for three main reasons. First, to identify the most relevant characteristics of platform in the new space economy; second, to define homogeneous groups, i.e. platform archetypes, of platform-based new ventures operating in this context; third, the introduction of a common terminology to be adopted by taxonomy users.

3.1 Empirical context

According to OECD (2022, p. 19) [22], the space economy is defined as "the full range of activities and the use of resources that create and provide value and benefits to human beings in the course of exploring, understanding, managing and utilizing space. Hence, it includes all public and private actors involved in developing, providing and using space-related products and services, ranging from research and development, the manufacture and use of space infrastructure (ground stations, launch vehicles and satellites) to space-enabled applications (navigation equipment, satellite phones, meteorological services, etc.) and the scientific knowledge generated by such activities". The focus is on the new space economy that differs from the traditional one for a series of reasons. New space economy encompasses also private actors, whose nature is different from the one of players in the traditional space industry, which was characterized by the proprietary presence of governments. The development of the new space industry and of the actors involved are addressed, highlighting the evolution of the value capture mechanism and the value generation process that leverage advanced technologies and business strategies. If the early stages of space economy were mainly oriented to space exploration and the launch of scientific and commercial satellites, the most recent phase is characterized by a shift to new activities, such as asteroid mining, space tourism and data analysis and management. In recent years, mainly due to the attractiveness of the space economy and related industries, there was an increase in the presence of startups and private equity and venture capital funds. Therefore, it is possible to see the birth of Private Public Partnerships (PPP), defined as ''partnerships between the public sector and the private sector (industry), for the purpose of delivering a project or a service traditionally provided by the public sector'' (Parrella et al, 2022, p. 293) [23].
Following OECD (2022, pp. 30-31) [22] definitions, it is possible to mention the existence of at least three main segments of the space economy, namely the upstream space sector, the downstream space sector and space-derived activities in other sectors. The upstream segment includes "Scientific and technological foundations of space programs, manufacturing and production of space

infrastructure". The activities belonging to this sector are numerous ranging from research activities, carried out by higher education's institutions, privates, public and non-profit organizations, to other services such as legal services, consultancy, insurance and finance. It is important to specify that this sector is the enabler of all activities performed in other space fields. The downstream space segment entails "space infrastructure operations and "down-to-earth" products and services that directly rely on satellite data and signals to operate and function". Among the most significative tasks in this sector, it is possible to mention all operations that exploit and manage space and ground systems and that allows the delivery of products and services for the consumer markets, such as GPS-enabled devices, communication devices and GIS. The third segment is represented by the space-derived activities, that are "derived/induced from space activities but are not dependent on it to function". Therefore, this sector is referred to product and services that are not strictly included in the space industry.

In order to complete the description about the empirical context, it is necessary to address the development of information systems in the new space economy. The need to deepen this topic is useful to facilitate a better understanding of the results highlighted in the next chapters. Since the space economy includes all activities necessary both to collect spatial information and to deliver the products and services based on this kind of data, information systems can widen their scope by being involved in the industry processes. Information systems are enabler of the digital commerce in the space economy, allowing the establishment of marketplaces in which space-based products and services are exchanged between buyers and sellers. Since these markets are in the early development stage, these digital infrastructures can facilitate the research of the required goods and therefore reduce the transaction costs. Information systems allow the collection, the processing and the distribution of big amount of spatial data which represent a new type of information. Indeed, several measures, that cannot be surveyed with existing technologies, can be collected thanks to satellite images and other instruments located in orbit or in the outer space. Therefore, data analytics can leverage spatial data in order to obtain new trends or insights about a large set of industries.

3.2 Taxonomy method employed

Starting from the definition of the new space economy and platform provided by OECD (2022) [22] and Cennamo (2023) [8] respectively, in order to develop the taxonomy, it was necessary to build the database on which the cluster analysis is carried out. In order to obtain the final database made by 134 European start-up platforms in the new space economy, a preliminary analysis on five main sources of data was performed. These initial samples were chosen from the most valuable and reliable business databanks available. It is useful to specify that the companies considered are those that have declared their headquarters in the EU, regardless of the countries in which they run their business, and that are established from 2005. In this process, three main phases were executed, as shown in Figure 1. The first one had the objective to understand whether a company belonged to the new space economy or not. The second phase was aimed to specifying the space sector and the industry of application of the selected companies. The third phase had the goal of understanding which ones, among the filtered companies, had a platform business model, by checking their adherence to the chosen definition. The process of this quantitative and qualitative assessment on firms was arranged as follows in each of the different phases carried out to create the final databank: first, the five samples were allocated to each of the master thesis students involved in the project; second, a cross validation analysis was carried out to check the individual work and obtain a common structure; third, a common rearranged database was built and exploited by each student to carry out the following steps.

Firms included in the databases were filtered, in the first phase, according to an array of selected keyword intended to capture the essence of new space economy activities. These keywords were validated by experts in the new space economy field. The data banks from which companies were drafted are Crunchbase, Orbis, Pitchbook and ESA Business Incubation Centers. Among the enterprises encompassed in the ESA BICs, there were also the firms under the ESA definition of Transfer Technologies (TT) startups, i.e. activities in other sectors which exploit technologies initially applied in the space economy, and therefore excluded in the final analysis. An additional double check is then carried out by exporting on Orbis the files obtained at the end of the preliminary analysis on the other databases. Orbis is the most updated dataset available and thus the purpose of this process is to identify and revise those companies that have changed their name across time and exclude those firms that decided to modify their business model and therefore that are not operating anymore in the space economy. Once obtained these preliminary databanks, the subsequent process focused on the identification and classification of firms in the sector of relevance and their application according to the OECD (2022) [22] definitions outlined in the empirical context. The aim of this step was to collect additional information and categorize companies to better compare the different findings. The final step encompassed the identification of companies adopting a platform business model starting from the ones already filtered in the previous phases. In order to do this, consistently with the definition provided by Cennamo (2023) [8], a firm is considered as a platform whenever: (1) allows the interaction among different sides acting as an intermediary, (2) indirect network effects subsist between at least two sides, (3) the company acts as infrastructure either to market products and services, to develop innovative goods and to collect and distribute information.

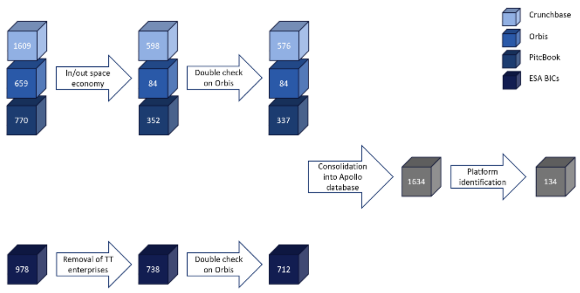

Figure 3.1: Building process of the final database with numbers

In order to design the underlying taxonomy, it was necessary to start with its definition. According to Nickerson et al. (2013, p. 340) [1], "a taxonomy T is a set of its n dimensions D_i (i=1, …, n) each consisting of k_i (k_i≥2) mutually exclusive and collectively exhaustive characteristics C_ij (j=1, …, k_i) such that each object under consideration has one and only one C_(i,j) for each D_i". Therefore, the aim of this taxonomy is to provide an exhaustive number of dimensions consisting in a set of characteristics sufficient to properly describe the archetypes of the platform business model in the new space economy, highlighting the key features for each group. Consistently with the methodology provided by Nickerson et al. (2013, p. 343) [1] the meta-characteristic was defined. It can be considered as "the most comprehensive characteristic that will serve as the basis for the choice of characteristics in the taxonomy". In this taxonomy the meta-characteristic is represented by how platforms are able to generate value in the new space economy. The meta-characteristic should reflect the purpose of the taxonomy itself which in turn should be determined based on the taxonomy users, embodied by investors, regulators and researchers. The final objective is to understand how an established business model, i.e. platforms, can be applied to an emerging context like the new space economy, which affect a large set of related industries. The taxonomy development suggested by Nickerson et al. (2013) [1] is based on an iterative process, in which dimensions and characteristic are added and modified until the ending conditions are reached. They represent the necessary requirements to conclude the process and are both objective and subjective. The former entirely rely on the definition of taxonomy and they are necessary to ensure the mutual exclusivity of the characteristics, securing that none of them is unnecessary. The verification of objective ending conditions can be validated in an undisputable way. The latter depends instead on the aim and the level of detail required by the developer of the taxonomy; indeed, it is not possible to objectively verify whether they are met or not.

Table 3.1: 3 and subjective ending conditions, Nickerson et al. (2013) [1]

Objective ending conditions	Subjective ending conditions
All objects or a representative sample of objects have been examined	The number of dimensions is sufficient to describe the object in a concise manner
No object was merged with a similar object or	The taxonomy is robust enough to guarantee a sufficient level of

split into multiple objects in the last iteration	differentiation among objects
At least one object is classified under every characteristic of every dimension	The dimension and characteristics must comprehend all the objects and be of interest
No new dimensions or characteristics were added in the last iteration	The set of dimensions and characteristics can be easily extended
No dimensions or characteristics were merged or split in the last iteration	The dimensions and characteristics explain to a sufficient extent all the objects
Every dimension is unique and not repeated (i.e., there is no dimension duplication)	
Every characteristic is unique within its dimension (i.e., there is no characteristic duplication within a dimension)	
Each cell (combination of characteristics) is unique and is not repeated (i.e., there is no cell duplication)	

After having described these necessary features, it is useful to explain the different approaches that can be implemented in order to develop a comprehensive taxonomy. According to the exemplar paper [1], three possible methodologies can be adopted: the inductive or empirical, starting from observing the available sample, the researcher aims to find significative dimensions or characteristics through the identification of patterns exploiting cluster analysis or other descriptive and statistical techniques; the intuitive, according to the level of comprehension of the context, useful dimensions and characteristic are developed ad hoc in line with the purpose of the taxonomy; the deductive or conceptual, exploiting theoretical knowledge and academic background in the related fields of application, the researcher identifies dimensions and characteristics without directly relying on the empirical set.

These approaches should be implemented in an iterative way, until both the objective and subjective ending conditions are satisfied. It is important to highlight that the iterative process could lead the researcher to slightly modify the meta-characteristic previously defined, according to additional findings arising during the procedure. The proposed taxonomy is based on the conceptual to empirical approach, in order to have a more structured theoretical framework, relying on a cluster analysis performed on the 134 European platforms in the new space economy. Starting from a firm level information, in order to perform the cluster analysis, five dimensions were defined at the end of three iterations. The five dimensions can be divided into an ordinal dimension and four categorical variables, among which three are binary and one can assume three possible characteristics. Additional dimensions, as the typology of the sides involved, such as B2B, B2C and C2C, were initially considered. However, its statistical significance was not relevant to be included in the final set of variables upon which the final cluster analysis is built. The K-means is the selected clustering technique since, according to Ketchen and Shook (1996) [24], it represents the optimal method to ensure the within-cluster homogeneity and the between-clusters heterogeneity. The number of optimal clusters is chosen by observing the elbow graph, and 5 clusters allow to reach a sufficient level of detailed and allowing to extend the obtained clusters to firms that are not included in the study. The validity of the results was verified both by running several statistical tests such as the MANOVA and the silhouette analysis (0.7364), and by checking the internal homogeneity and external heterogeneity in between and among clusters.

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                  Multivariate linear model
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--------------------------------------------------------------
           x0            Value  Num DF  Den DF  F Value  Pr > F
--------------------------------------------------------------
          Wilks' lambda 0.0955 5.0000 129.0000 244.4572 0.0000
         Pillai's trace 0.9045 5.0000 129.0000 244.4572 0.0000
 Hotelling-Lawley trace 9.4751 5.0000 129.0000 244.4572 0.0000
    Roy's greatest root 9.4751 5.0000 129.0000 244.4572 0.0000
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Figure 3.2: MANOVA results

The Wilks' lambda value close to zero and the Pillai's trace approaching to one underline the homogeneity within and the heterogeneity between clusters. The p-value lower than 0.0001 for each test highlights that the clusters are statistically significant.

Table 3.2: Dimensions and characteristics

Dimension	Description	Characteristics	Theoretical references
Scalability	Variable that explains the level of scalability of a platform in the new space economy	Low Medium High	“scalability [...] Business model scalability is the extent to which a business model design may achieve its desired value creation and capture targets when user/customer numbers increase and their needs change, without adding proportionate extra resources [...] scale economies are particularly obvious in digital businesses, as the development costs of products and services are high, but the marginal cost of adding another customer is negligible […] scalability is enhanced by the dynamics of learning by using, network externalities […]”, Zhang et al. (2015, p. 5) [16]
Platform typology	Variable that explains whether the platform acts as market place, information/data provider or innovation hub	Complementary innovation Information Multi-sided transaction	“In complementary innovation markets platforms are primarily innovation engines, providing the core technological architecture other firms build upon to create new products that extend the core functionality and reach of the platform to final users [...] In information markets, the platform serves primarily as an information channelling infrastructure that enables the categorization and search of relevant information, and facilitates users’ exchange of information and matching [...] In a multi-sided transaction market, the platform’s main role is providing the infrastructure to connect providers of goods and services with final customers, and facilitate value-exchange transactions among them”, Cennamo (2023, pp. 6-9) [8]
Competitive domain	Variable that identifies whether the platforms’ scope is s	Core domain Core domain and adjacent markets	“Also, platform envelopment and competitive dynamics can lead to the shifting of the competitive domain and redefinition of the market boundaries;

	limited to a single industry or affects adjacent markets		platforms may soon find themselves competing into a larger market domain resulting from convergence of previously separate, adjacent markets", Cennamo (2023, p. 31) [8]
Space segment	Variable that describes if a company operates in the downstream of the upstream segment of the space economy	Downstream Upstream	"The upstream segment representing the scientific and technological foundations of space programmes (e.g. science, R&D, manufacturing and launch) […]. The downstream segment (space infrastructure operations and "down-to-earth" products and services that directly rely on satellite data and signals to operate and function)", OECD Handbook on Measuring the Space Economy (2022, p. 30) [22]
Network architecture	Variable that identifies whether users represent both the demand and the	Peer-to-peer Not distributed	"A distributed network architecture may be called a Peer-to-Peer (P-to-P, PZP, ...) network, if […] the participants of such a network are thus resource (Service and content) providers as well as resource (Service and content)
	supply side		requestors", Schollmeier (2001, p. 1) [25]

The first iteration was carried out taking into account three characteristics all strictly pertaining to the platform context, i.e. platform typology, network architecture and scalability. The consideration of these initial variables lies in the possibility to rely on an established literature and has the aim of first identifying firms taking into account elements which do not directly belong to the new space economy. It is important to highlight that, since the objective of the study is the development of a taxonomy of platform business model in the new space economy, whatever the results arising from this iteration, the clusters cannot be considered as exhaustive since they do not encompass any space related dimension. The first cluster analysis led to the definition of four clusters which do not satisfy both all objective and subjective conditions. Indeed, the level of detail was not sufficient and consequently a new dimension had to be added in the next iteration; moreover, the statistical tests conducted highlight a low homogeneity within the clusters. Therefore, the first iteration did not lead to significative clusters both form a conceptual and statistical point of view. In the second iteration a new dimension was added to start considering some elements of the new space economy, and for this reason the cluster analysis was carried out with four variables, i.e. platform typology, network architecture, scalability and competitive domain. Even though an improvement in clusters homogeneity, similar firms still belonged to different groups, reducing therefore the heterogeneity among them as highlighted by the silhouette analysis and the inertia. As the previous iteration, the objective and subjective ending conditions were not satisfied, and an additional dimension had to be introduced to obtain meaningful clusters. In the third iteration, the cluster analysis was carried out by taking into account five dimensions by adding the space segment, which allowed to understand the stage of the space value chain in which the specific company operates. The introduction of this dimension improved both the homogeneity within the clusters and the heterogeneity among them. It is important to highlight that five clusters were obtained, and the statistical tests verified the validity of the results from an objective point of view. The significance of the clusters was also sufficient to satisfy the subjective ending conditions and it was not necessary therefore to add a new dimension and to carry out other iterations.

4. Findings

The cluster analysis identified five clusters which are the most suitable to describe the archetypes of platform business model in the new space economy, consistently with the meta-characteristic of the taxonomy. Relying on the reference sample, the five groups allow each platform to be included in one of them according to its main features. The five clusters, (1) "Scientific and technological foundation platforms", (2) "New space economy cloud platforms", (3) "Crowdinvesting platforms for SDGs", (4) "Public-private information platforms", (5) "Space-enabled services marketplace platforms", are labelled according to their attributes and to the existing related literature. The number of firms included in the clusters are respectively 19, 19, 30, 43, 23.

Table 4.1: Clusters

Cluster	Reference	Characteristics
Scientific and technological foundations platforms	"[the upstream activities are the] scientific and technological foundations of space programmes, manufacturing and production of space infrastructure", OECD Handbook on Measuring the Space Economy (2022, p. 31) [22]	• Complementary innovation • Upstream • Peer-to-peer • Core domain and adjacent markets • Low
New space economy cloud platforms	"Industry clouds are defined as cloud-based services that provide broad industry value by aggregating cost reduction, operational benefits, risk mitigation and/or insight creation via pooled information. The two types of industry clouds are: (1) where a company provides cloud-based services to other companies in their industry; and (2) a cloud-based platform through which companies in an industry collaborate towards a common goal, such as improving industry insight and/or capability", Stone et al. (2017, p. 227) [26]	• Information • Downstream • Not distributed • Core domain and adjacent markets • High

Crowd investing platforms for SDG	"In order to substantially contribute to sustainable development and to finance growth-oriented sustainable ventures, investment-based crowdfunding seems the most relevant approach", Horisch and Tenner (2020, p. 3) [27]	• Multisided transaction market • Downstream • Not distributed • Core domain • Medium
Public-private information platforms	"Public–private platform as a governance structure and information infrastructure interconnecting two or more distinct types of affiliated and collaborating actor groups, from both the public and the private sector", Klievink et al. (2016, p. 69) [28]	• Information • Downstream • Not distributed • Core domain • High
Space-enabled service marketplace platforms	"In online service marketplaces, buyers (firms or individuals) post tasks they would like to procure and sellers bid for them", Moreno and Terwiesch (2014, p. 865) [29]	• Multisided transaction market • Downstream • Not distributed • Core domain and adjacent markets • Medium

The "Scientific and technological foundation platforms" cluster includes companies whose business model aims to connect players who provide services related to the development and enablement of the space economy, such as infrastructure, R&D and education services, among which universities and institutional collaborations. Other typologies of users which join such networks are represented by spacecraft and other space infrastructure manufacturing companies. The presence of public entities in these platforms' network is frequent for two main reasons. First, the companies belonging to the ecosystem are often involved in space-related R&D activities, which generate interest for the public sector since innovations can benefit a multitude of firms improving therefore the social welfare. Second, the activities performed by platform actors are necessary for the realization of space missions, carried out by public institutions in the traditional space economy framework. Since all enterprises in this cluster operate in the upstream space segment, the cluster name takes inspiration from this stage of the space value chain defined by the OECD (2022, p. 31) [22] as "the scientific and technological foundations of space programmes, manufacturing and production of space infrastructure". Outside of this cluster there are all platforms which are not involved in R&D activities, education programmes and manufacturing services of space infrastructure. Starting from the platform typology, these firms are involved in complementary innovation markets; indeed, they connect companies which aim to provide innovative technologies and advanced knowledge to the new space economy. In this context some players launch R&D projects and other users decide to join them to realize goods and technologies able to generate value to the whole space value chain. The outputs of the collaborations aim to improve technologies exploited for the propulsion and cooling systems of spacecrafts, telecommunications techniques and the training of the astronauts. One of the most recurrent topics nowadays is represented by the removal of space debris, which are necessary to the protection of space infrastructure and therefore the continuity of space activities. As previously pointed out, these platforms operate in the upstream stage, and they are an example of a peer-to-peer network architecture. In fact, companies which propose innovative projects are frequently involved in initiatives started from other users of the network. The same user can both launch an innovative project and contribute to initiatives started by other actors in the ecosystem, having therefore the possibility to belong to the two sides of the network. Given the cross-industry nature of the new space economy and considering that these companies are located in the first stage of the value chain, their activities involve actors belonging to different markets. A platform which connects actors who search specific technologies and components for a space mission facilitates the collaboration between players which provide the space propulsion, the telecommunication systems and other software necessary to the realization of the activity. Despite the adoption of a platform business model, these firms have a limited level of scalability. Indeed, the specificity of the assets required to carry out the activity and the consequent difficulty to redeploying them prevent these companies from seamlessly adding new value sources to their revenue streams. Furthermore, although being digital platforms, the level of dematerialization is constrained by the physical nature of the activities necessary to run the business.

Table 4.2: Representative firms of cluster 1

Company	Description
Firm 1	Firm 1 is a spin-off of a university and aims to connect other startups looking for financing from other investors and for support in the development of innovative products and services. Therefore, this platform is able to connect actors from the financial sectors with manufacturing or service companies which operate in several markets. Moreover, except for financiers, companies can both launch projects and be engaged in other initiatives started from other users. The scalability of the company is bounded by the fact that the projects launched by a side of the market are mainly related to R&D activities, which imply the management of complex dynamics between parties and the deployment of a consistent amount of specific resources.
Firm 2	Firm 2 is a network connecting space infrastructure manufacturing businesses and several actors in other markets which offer and ask for components to develop other products for space missions. Companies can cover the role of supply and demand in this relationship and the level of scalability of the platform is constrained by the specificity of the projects in the ecosystem.
Firm 3	Firm 3 is able to offer a network in which companies of different sectors collaborate to realize space missions. The actors can both ask for some components and services and supply them to other players. The high level of specialization required to carry out the intermediation activity constraints the platform to a low level of scalability.

The "New space economy cloud platforms" cluster encompasses companies whose business model is focused on the collection, elaboration and provision of data from and to different actors, leveraging technologies such as machine learning, cloud computing and artificial intelligence. The definition of the cluster naming is shaped starting from the literature on digitalization and its impact in the industry management domain. In particular, according to Stone et al. (2017, p. 227) [26] "Industry clouds are defined as cloud-based services that provide broad industry value by aggregating cost reduction, operational benefits, risk mitigation and/or insight creation via pooled information. The two types of industry clouds are: (1) where a company provides cloud-based services to other companies in their industry; and (2) a cloud-based platform through which companies in an industry collaborate towards a common goal, such as improving industry insight and/or capability". Outside of this cluster there are all platforms which do not create a collaborative environment for data collection, processing and distribution, but simply generate revenues by selling them without any further elaboration. The included firms run their businesses in information markets since their main activity is to provide users with a cloud infrastructure where data are collected, stored and exchanged between parties, generating value from derived activities. The data collected, processed and shared in the platform are the foundation upon which information is built by the demand side of the network. It is important to highlight that, however, the network architecture of the cluster is not distributed since one side of the market, represented by satellite infrastructures' owners, always cover the role of the supply and the other, characterized by companies in the following stage of the value chain, constitutes the demand side. The platforms belonging to this cluster operate in the downstream stage considering that they do not contribute to the creation of spacecrafts and satellites necessary to collect data, but simply manage their aggregation, elaboration and distribution through a digital infrastructure. The actors connected through these networks belong to different industries, since the data exchanged within the platform be useful for environmental purposes and for the processes of companies belonging to the logistic, insurance and maritime sector. Given the nature of data platforms and the almost null marginal costs to sustain while pushing an expansion of the customer base, the scalability level is high. The fixed costs to build the digital infrastructure necessary to run the business are significative, but they represent the only consistent investments sustained by these platforms. The technologies exploited by these platforms, such as the machine learning and the cloud computing need a high quantity of data to perform at their full potential, without however increasing the marginal costs. These features allow therefore these platforms to benefit from a high level of scalability.

Table 4.3: Representative firms of cluster 2

Company	Description
Firm 4	Firm 4 is specialized in providing data upon which information is build and delivered through products and services build by the demand side of the network. Considering the adaptability of spatial data and their usefulness, company 4 involves firms coming from sectors like the environment-related ones and the maritime industry. The flexibility of the platform infrastructure allows the possibility to easily and seamlessly interconnect a wide range of players increasing the ability to scale up by enlarging its business scope and unlocking new sources of value generation.
Firm 5	Firm 5 focuses on collecting and sharing data useful for terrestrial and maritime logistic purposes involving both the public and the private sector. This company leverages on blockchain technology to build a reliable infrastructure where users can look for the necessary data. Since almost the entirety of costs sustained by the platform is fixed, the user base can be expanded without deploying significative additional resources.
Firm 6	Firm 6 leverages machine learning to create a single cloud where the actors involved upload raw data coming from public satellites in order to obtain insights useful for their decision-making process. A lot of companies belonging to different industries join the network and facilitate the generation of additional revenue streams. Moreover, the high level of scalability is enhanced by the fact that strongly relying on machine learning, the more the data to process, the higher the benefit the algorithm is able to deliver and consequently, the attractiveness of the platform itself increases.

The companies belonging to the cluster named "Crowdinvesting platforms for SDGs" are all platforms which connect initiators of SDG related projects and investors interested in sustainable activities. According to Horisch and Tenner (2020, p. 3) [27], "in order to substantially contribute to sustainable development and to finance growth-oriented sustainable ventures, investment-based crowdfunding seems the most relevant approach", and this definition represents the reason of the cluster's denomination. The companies within this group are committed to the achievement of three main sustainable development goals, among the seventeen defined by the United Nation Department of Economics and Social Affairs: Goal 2, "End hunger, achieve food security and improved nutrition and promote sustainable agriculture"; Goal 13, "Take urgent action to combat climate change and its impacts"; Goal 15, "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss". These firms are mainly involved in financing agricultural projects in developing countries and in the management of forestry in high-risky areas. Investors are mainly individuals; however, some institutions can join the platform network. All platforms which do not provide any financing service, and which are not involved in the development of SDGs related activities are not included in this cluster. These platforms run their business in multisided transaction markets considering that several types of users are connected to the network. In fact, the transaction happens between the projects' initiators and the financiers, however other actors are often involved, such as companies which issue carbon certificates and advertisers. It is important to explain that some platforms in the cluster are also able to directly track the carbon emission and provide the related certificates, which can represent a solution to the information asymmetry which the investors can suffer from. Indeed, a third party or the platform itself can confirm the SDG related results that the project can achieve. All these companies operate in the downstream segment since they exploit satellite data, for example to measure carbon emissions directly from space. Since these platforms clearly distinguish the roles of the two sides involved in the transaction, the network architecture is not distributed. Moreover, the demand includes firms looking for financing, while the supply side is represented by individuals which invest in these initiatives. Each firm is specialised in a single market; indeed, some companies are focused only on sustainable agriculture while others exclusively on the forestry management. The scalability level of these platforms could be higher since the marginal costs to manage a transaction are limited; however, some processes, such as the issue of carbon certificates, require a consistent amount of resources to be completed.

Table 4.4: representative firms of cluster 3

Company	Description
Firm 7	The firm 7 is a representative observation for this cluster since it is a company which certificates the carbon emissions for sustainable forestry objectives and connect the investors with the actors involved in these projects. The platform is specialized in this specific sector and the tasks required for the certificates do not allow the company to achieve a high degree of scalability.
Firm 8	The firm 8 is specialized in the environment sustainability, and it fosters SDGs related projects to be financed not only by individuals, but also by insurance and financing companies. The scalability is constrained to a medium level since the activities necessary to verify the achievement of climate-related sustainable goals.
Firm 9	Firm 9 is involved in the financing of projects related to agricultural practices in emerging countries favouring the supply of food for local communities. The processes to be implemented in order to manage the right allocation of the collected fundings bound the level of scalability of the platform itself.

The "Public-private information platforms" cluster comprehends companies which generate value by facilitating activities in different industries, such as the mobility and logistics, through the provision of processed information coming from satellites' data. The definition of the cluster naming refers to the literature on public and private interactions as a mechanism to support social welfare maximization. In this specific context, according to Klievink et al. (2016, p. 69) [28] public–private platforms are "a governance structure and information infrastructure interconnecting two or more distinct types of affiliated and collaborating actor groups, from both the public and the private sector". Outside of this cluster there are all the platforms which share raw data and do not deal with the distribution of information to the network. Focusing on the platform typology, these businesses operate in information markets since their main activity is to provide users with a digital infrastructure where information is provided to a side of the network by elaborating data coming from the other one, generating value for the platform ecosystem. The network architecture of the cluster is not distributed since the flow of information moves from the public sector towards the private one; indeed, the former collect data which are exploited by the platform to generate information that is provided to the latter. It is interesting to underline that these platforms focus on single industries at once. The most targeted sectors by cluster 4 platforms are the mobility, the maritime and the tourism. This does not negatively affect their scalability level, considering that, in any case, the value generation process follows the same configuration for each targeted space-derived sector. The provision of information is in fact the core activity for all the companies belonging to this cluster and the replication of the business model in other geographical areas or industries is almost costless from an asset redeployment perspective. This makes cluster 4 startups easily scalable. These firms operate in the downstream stage considering that they only rely on satellite data and are not involved in any manufacturing process through which the leveraged space infrastructures are built.

Table 4.5: representative firms of cluster 4

Company	Description
Firm 10	Firm 10 focuses its activities in the maritime logistic sector, and it is specialized in the optimization of port operations. It has a high degree of scalability thanks to the possibility of a seamless replication and negligible marginal costs. Being the port a public infrastructure, there is the involvement of the public and private sector, represented by maritime and ship crafts companies, that are turning to the platform to gather useful information about cargo and passengers flows to maximize their respective objectives.
Firm 11	Firm 11 is a platform developed for tourists visiting a specific geographical area. The public and private players can upload information about the interest points and other commercial activities, while the final users can exploit the platform to find useful insights for their travels. The level of scalability is not limited by almost any constraint and it is easily replicable in other geographical areas.
Firm 12	Firm 12 is a platform that provides services in the mobility industry. It connects public transportation companies with citizens through a digital interface with the aim to optimize the users flow and provide relevant information which can impact the social welfare. All the information processed are collected via satellites, which, together with a standardized digital infrastructure, allow a fast and costless replication of the business model in other urban areas and sectors. In this case, the public institution covers the role of the supply, providing data through satellites about traffic dynamics and citizens flows, while individuals represent the demand when using the platform looking for information.

The companies able to match the offer and the demand for services built on satellite data are collected in the "Space-enabled service marketplace platforms" cluster. According to Moreno and Terwiesch (2014, p. 865) [29], "in online service marketplaces, buyers (firms or individuals) post tasks they would like to procure and sellers bid for them". It is important to highlight that, while the offer side includes both firms and individuals, the supply side is exclusively represented by companies. These marketplaces connect actors who offer and look for services which rely on the outputs of the new space economy, often represented by satellite data. This is the reason of the definition of space-enabled service marketplace platforms. All companies with a similar business model, but which do not act as a marketplace, or which offer financing, data and information are not included in this cluster. The firms in this sample operate in multisided transaction markets, where several actors benefit from the increasing number of the other typologies of users. Indeed, the higher the number of companies which offer the service, the higher the interest of buyers to join the platform. Indeed, the latter have the possibility to choose from different sellers, exploiting the better differentiation and the higher competition. Symmetrically, users which sell services are more willing to join a platform with a high number of actors asking for these goods. These two sides represent the key typologies of users, however also advertisers and other actors, such as online payments companies, are connected to the network. This cluster does not collect any company which is involved in the realization of space infrastructures and therefore these firms are included in the downstream stage of the space value chain. In these platforms, companies selling services are separated from the ones which buy them, and the role between the two typologies of users cannot be exchanged. Consequently, the architecture of this network is not distributed. Moreover, supply and demand represent respectively the input and the output of a value chain segment, not allowing a firm to cover the two roles. The actors connected to the network belong to different markets, indeed a company which offer a service can adapt its offering according to the requests of customers. The reason behind the medium level of scalability is represented by the need to perform complementary activities to verify users' proficiency, since the low marginal costs to connect other users would allow the platform to be highly scalable.

Table 4.6: Representative firms of cluster 5

Company	Description
Firm 13	Firm 13 is a platform specialized in matching users providing Earth observation services to monitor the characteristics of agricultural fields and forests with farmers and other companies willing to obtain additional information on how to improve the productivity of their businesses. The level of scalability is limited by the activities necessary to verify the reliability of the services provided by one side of the market.
Firm 14	Firm 14 is a company which connects users able to offer services in the agriculture and forestry, such as the verification of carbon certificates, and firms which compete in these areas. For the sake of clarity, this company is different from Firm 7, since the former is a marketplace for services, while the latter focuses on financing activities. The scalability degree is medium since the processes necessary to efficiently connect users involve additional resources, while the low marginal costs to increase the number of users would are able to increase the ability of scaling up of the company.
Firm 15	Firm 15 is a marketplace for goods related to the construction of buildings, such as IoT and software services. The businesses responsible for the construction of the building can search other companies able to offer the necessary services on the platform. The service can be sold to firms which belong to different markets, and the buyers request can require a high level of expertise to be carried out. The processes necessary to verify the service supplier competence reduce the level of scalability of the platform whose low marginal costs would be a great opportunity for the company to scale up.

The Figure 2 is a simplified two-dimensional representation of the clusters according to the platform typology and the competitive domain, which are the two platform features suggested by Cennamo (2023) [8]. Moreover, the colour of each box indicates the level of scalability of the companies belonging to the cluster. The choice to represent an additional dimension allows to merge established criteria for the categorization of the platforms with a current and highly discussed topic such as the scalability. In this way it is possible to understand whether the new space economy is a favourable environment for companies to exploit the dynamics within and consequently scale up their business.

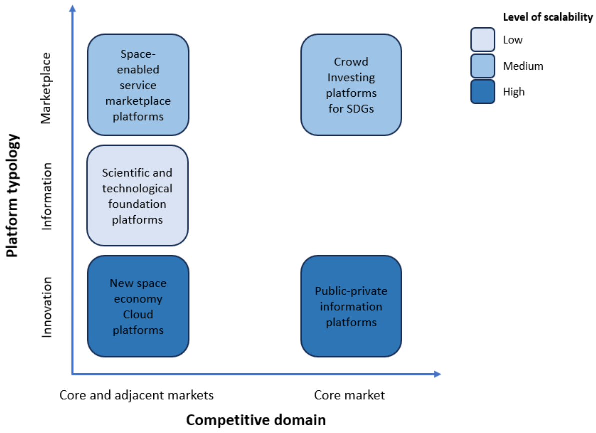

Figure 4.1: Two-dimensional simplified representation of clusters

5. Discussion

The numerosity of each identified cluster allows to highlight the high frequency of public-private information platforms, whose firms represent the 32% of the whole sample. Therefore, this result confirms the participation of both public and private sector in the new space economy and the strong existing interaction among them. In particular, the main role of public actors is the participation in the realization of spatial infrastructure and the collection of satellite data, which enable the activities performed in the downstream stage. Together with public-private information platforms, new space economy cloud platforms operate in information markets. Companies which compete in this type of sector represent almost the half of all firms in the sample, highlighting the crucial role of space data and their versatility in the value generation process of different markets. It is possible therefore to point out the cross-industry nature of the new space economy, and consequently the possibility for the platforms to enter several value chains. Moreover, new space economy clouds exploit advanced technologies such as machine learning, artificial intelligence and blockchain, whose attractiveness could lead to an increasing number of firms belonging to this cluster. The only platform archetype operating in the upstream is represented by the "Scientific and technological foundation platforms" cluster since it encompasses all companies that provide the necessary infrastructure from which all the downstream activities are built. Cluster 2 represents the point of contact between the beginning and the end of the space value chain. The remaining clusters are the only ones able to directly provide value to final customers and therefore the related platform archetypes can be placed in the downstream sector. In this stage, together with public-private information platforms, it is possible to observe some marketplaces which can be encompassed in the "Space-enabled service marketplace platforms" and the "Crowdinvesting platforms for SDGs" clusters. These firms connect the offer and the demand of the market by enabling the reduction of transaction costs of the parties. The main difference between the two archetypes is represented by the reason of the transaction which is executed on the platform. Indeed, in space-enabled service marketplaces the demand exploits the platform to search the best provider of a specific service within the offer side. On the other hand, the crowdinvesting platforms for SDGs allow the project developers to find financing from other actors which can be both individuals and companies. Another divergent aspect is the range of markets where these clusters companies compete. In fact, cluster 3 platform archetype targets only a specific market which is always related to the concepts of sustainability and social inclusion. Firms in cluster 5 can often target different sectors by including in the network actors which belong to several industries. Both types of marketplaces exploit satellite data to perform their activities, and the crowdinvesting platforms for SDGs leverage them to track the achievement of specific sustainable goals or to provide information about the projects to the interested investors. Moving to the upstream, the "Scientific and technological foundation platforms" cluster encompasses all those companies that allow the existence of all the other platform archetypes in the new space economy since they provide both the theoretical knowledge and the infrastructures necessary to operate in this context. Being the only cluster belonging to the first phase of the value chain and considering that its firms represent less than 20% of the analysed startups, it is possible to point out the lower probability to observe platform business models adopted in the upstream. It can be explained by the fact that the number and variety of actors that can join the network in the downstream is considerably higher than the ones that can be involved at the beginning of the space value chain. This is also due to the high level of specialization required for the manufacturing and technological activities performed by these players. Therefore, the possibility to create strong network externalities and reach the critical mass is limited for the companies running their business in the upstream sector. Cluster 1 firms represent the third platform typology, i.e. innovation platforms. Indeed, the actors involved cooperate to generate value by bringing innovation to the market through the realization of cutting-edge technologies and projects, such as space infrastructures and space missions. It is interesting to highlight that in this stage of the value chain the central firm represents the interface through which users connect, creating an open innovation ecosystem which can foster the value generation process in the new space economy. Moreover, these are the only platforms which include actors whose activities are oriented towards the manufacturing of physical products. Indeed, for all other clusters, the users of the related network provide services and digital applications. In the downstream most of businesses can offer services which are built upon the satellite data and that require a lower amount of investments to start and run an activity than the ones necessary in the upstream. The wider adoption of platform business model in the downstream can be also explained by the fact that individuals can be involved in the ecosystem and therefore the company can rely on a bigger user base.

It is possible to attribute a specific level of scalability to each company belonging to the new space economy whatever their adoption of a platform business model. The firms with the lowest degree of scalability are the ones in the upstream which are specialized in the manufacturing of highly complex products, such as spacecrafts. Indeed, for these companies the additional costs required to start a project are almost constant and significative. These elements prevent the company form easily scaling up, since the amount of resources needed to satisfy the demand increase at a steady rate with the number of projects undertaken by the company itself. The firms in the sample benefit from higher levels of scalability than the previous typologies of enterprises since their platform business model allows them to exploit an increasing user base. Furthermore, their digital infrastructure enables the provision of their offering to new users without sustaining almost any additional costs. It is important to highlight that none of the companies in the sample has a level of scalability comparable to the one of most scalable platforms competing in other markets, such as Amazon. In fact, its business model can generate new sources of revenues from both increasing the market penetration and enlarging the set of industries involved. The additional resources deployed to manage a rising number of users is almost null since the costs sustained to build the digital infrastructure necessary to the platform functioning are mainly fixed. Amazon benefits also from processes which can be easily automatized and from users which compete in a wide range of sectors. These aspects allow Amazon to reach one of the largest user bases in the world and therefore to be among the most successful platforms. Companies in the database have a level of scalability which is comprised between the one of manufacturing firms adopting a traditional business model and the one of companies similar to Amazon. The scalability of platforms included in the clusters can be either low, medium or high, according to the satisfaction of criteria formulated starting from the underlying literature. Firms with a high level of scalability are included in the "New space economy cloud platforms" and "Public-private information platforms" clusters, in line with the features of their business model. Indeed, they can rely on automatic and entirely digitalised processes which involve actors from different markets. They are not as scalable as Amazon since they are dependent on satellite data which bound these platforms to a narrower user base. "Crowdinvesting platforms for SDGs" and "Space enabled service marketplace platforms" clusters have a medium level of scalability since, despite the low marginal costs necessary to manage a larger number of transactions, they often need to carry out some processes which require additional resources to match the demand and the offer. The "Scientific and technological foundation platforms" cluster has a low level of scalability since the included businesses cannot automatise their processes at high levels and the marginal costs are not negligible because of the high specialization of the actors involved.

6. Conclusion

This study aims to understand how an established business model as platform finds an application in the emerging context of new space economy. The development of the taxonomy has the objective to address the literature gap represented by the point of contact between these two streams of the literature. The value of this research lies in three main contributions: first, the definition of a common terminology which can facilitate the adoption of a common language among practitioners; second, the identification of five main archetypes of platforms in the new space economy; third, the investigation of scalability levels of platforms within the space domain considering their typology and the range of markets in which they compete.

Starting from this consideration and the possibility to categorize space platforms in homogeneous groups according to their features, the future streams of the literature have the opportunity to verify the existence of additional clusters. Moreover, studies that focus their analysis on the European context can take these platform archetypes as a reference to generate additional insights to the specific topic. Taxonomy users can group platforms with similar features under a single name and subsequently deepen other characteristics for each of the identified groups, according to the objective of the research and the attributes of the cluster itself. Moreover, the developed taxonomy can be useful also to investors and regulators. Indeed, the former can benefit from an easier identification of similar companies in carrying out benchmarking activities, while the latter can exploit clusters features to set a global common standard for all startups and established companies which operate in the space market. The limitation of this study is represented by the difficulty in retrieving information about platforms in the new space economy bounding the analysis to the European context. Among the possible solutions, the extension of the study to the US based platforms allows to encompass a larger set of companies belonging to a more important market.

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7. List of Figures

8. List of tables

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