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# Regional determinants of access to entrepreneurial finance: a conceptualisation and empirical study in Norwegian startup ecosystems

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**ABSTRACT**

This paper presents hypotheses and a novel examination of the influence of a set of conditional factors concerning regional industries, startup culture, ecosystem collaboration and non-financial investor resources on perceived access to startup finance. We conducted a survey of 131 nascent, early-phase or mature startups and founders associated with entrepreneurial ecosystems in rural and urban Norway. The data were analyzed using structural equation modeling. Two main findings are that (1) startups that open up for outside involvement at an earlier phase experience better perceived access to finance and (2) unrelated ventures in homogenous industrial regions find it harder to attract finance. However, we found only a weak, indirect effect of ecosystem collaboration on perceived access to funding, which was mediated by access to non-financial resources. This study represents a rare empirical contribution to the literature on entrepreneurial ecosystems, and the findings provide empirical support for the feedback loops in ecosystems that have previously been theorized in the literature. These issues should be considered by policymakers who wish to promote ecosystem development.

**RÉSUMÉ**

Cet article présente des hypothèses et un nouvel examen de l'influence d'un ensemble de facteurs conditionnels concernant les industries régionales, la culture des startups, la collaboration de l'écosystème et les ressources des investisseurs non financiers sur l'accès perçu au financement des startups. Nous avons conduit une enquête auprès de 131 startups naissantes, en phase de démarrage ou matures, et de fondateurs associés à des écosystèmes entrepreneuriaux en Norvège rurale et urbaine. Les données ont été analysées à l'aide d'un modèle d'équation structurelle (MES). Les deux principales conclusions sont les suivantes: (1) les startups qui s'ouvrent plus tôt à la participation extérieure ont une meilleure perception de l'accès au financement, et (2) les entreprises non liées dans des régions industrielles homogènes

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ont plus de mal à attirer le financement. Cependant, nous n'avons trouvé qu'un faible effet indirect de la collaboration entre écosystèmes sur l'accès perçu au financement, qui était tempéré par l'accès aux ressources non financières. Cette étude représente une rare contribution empirique à la littérature sur les écosystèmes entrepreneuriaux, et les résultats offrent un soutien empirique aux boucles de rétroaction dans les écosystèmes qui ont été précédemment théorisées dans la littérature. Ces questions doivent être prises en compte par les décideurs politiques qui souhaitent promouvoir le développement des écosystèmes.

## 1. Introduction

Research on entrepreneurial ecosystems is gaining momentum, possibly due to its broad practical appeal (Audretsch et al. 2018). There are several definitions of entrepreneurial ecosystems, most of which describe a rooting in regional development where conditional factors may enhance entrepreneurship. The objective of this study is to examine financial interrelations in ecosystems; thus, we adhere to the definition of Bruns et al. (2017): *entrepreneurial ecosystems refer to elements in the entrepreneurs' environment that help them succeed (or not) in the efforts to grow a new venture* (p. 31–32). When the ecosystem literature mentions finance, it normally adopts the supply side stance. The day-to-day users and actors of ecosystems may be more concerned with how businesses interact in such systems, so we investigate the demand side of entrepreneurial finance in ecosystems.

Accessible financing for innovative firms is considered a vital factor for success in a venture (Berger and Udell 1998; Cassar 2004; Kerr and Nanda 2015), and evidence shows that there are structural effects that influence the accessibility of financing to innovative firms (Lee, Sameen, and Cowling 2015). While several aspects of financial access and performance have been thoroughly examined in recent decades, the fundamentals of entrepreneurial finance remain understudied (Landström 2017, 9). Therefore, this paper helps fill some of the gaps in the literature in (1) the relations in entrepreneurial finance and (2) financial dynamics in entrepreneurial ecosystems.

The aim of the current paper is to contribute to a better understanding of the role of finance in ecosystems. In the present study, we identify a set of conditional factors that, based on previous research, are presumed to be associated with access to finance and perceived firm performance. Additionally, we examine whether firms proximally access finance and added-value resources in ecosystems, how internal access boosts external access and to what degree conditional factors apply.

To examine these issues, we develop a measurement model and hypotheses that are operationalized based on the inferences of two existing business ecosystem frameworks (Frimanslund 2022; Spigel and Harrison 2018). Both approaches suggest that the robustness and vitality of financial ecosystems depend on a self-sustaining system of a sufficient number of startups and key actors such as intermediaries and capital providers, with sufficient competency and financial resources that are effectively acquired, distributed and shared among viable and eligible members through effective feedback loops within a reasonable time when needed. This should presume a large

degree of collaboration between the ecosystem actors where startups are pushed along the entrepreneurial voyage from realization of an idea to exit/buy-out. We then distribute a survey to innovative Norwegian startups affiliated with ecosystems such as incubators, science parks, hubs, and co-working spaces. The startups were asked about their financial determinants, relationships to financial sources, affiliations to their ecosystems and their perceptions of performance due to these factors. The data are then analyzed using structural equation modeling (SEM).

The paper presents two main findings. First, entrepreneurs who are more willing to share control and influence with capable investors experience better access to finance. Therefore, there seems to be a tradeoff between the control and resource accessibility of startups. Second, unrelated ventures in homogenous industrial regions appear to find it more difficult than related ventures in heterogeneous industrial regions to attract finance, which affects the perceived performance of the firm.

## 2. Literature review, hypotheses, and theoretical framework

Our quest addresses two different frameworks evident in the literature. At the business level, agency issues lie at the core of research on behavior in mature firms (Jones and Butler 1992; Van Osnabrugge 2000), including their financial choices (Giannetti 2003). Nevertheless, the validity of agency theory in predicting the behaviors of early-phase startups is challenged by questioning the assumptions of rational behavior and free financial markets (see a discussion on financial gaps for entrepreneurs in Murray (2007)). Early-phase entrepreneurs often do not find resources and information to be easily accessible. In addition, they may lack the knowledge to acquire them, and they are prone to various cognitive biases. When employing the ecosystem as the unit of analysis, a holistic perspective on the agency issues that arise during capital acquisition is needed. For example, when an ecosystem enhances access to initial funding and value-adding activities to new member startups, there are implications for issues concerning asymmetric information, signaling and screening, and pecking-order theories. The financial entrepreneurial ecosystem framework thus incorporates theoretical insights from both strategic management and systemic entrepreneurship, which are elaborated upon in the following sections.

### *2.1. The context of corporate and entrepreneurial finance*

In regard to the financing of firms, phenomena are often viewed through theories that collectively form a field that we may label transaction cost economics (Rutherford et al. 2017; Williamson 1975). These theories have been scrutinized over decades of research on finance and constitute core issues in management research. Relevant to the present study are theories such as agency and asymmetric information (Eisenhardt 1989; Jensen and Meckling 1976), which have been useful in addressing the informational barrier and subsequent risk between investors and investees. Further, the pecking-order framework (Myers and Majluf 1984) has been frequently referred to when examining the capital structure of startups. These theories have been proven valuable for highlighting financial acquisition behavior across contexts

(see various and representative examples in Avdeitchikova 2008; Bonini et al. 2018; Brander, Du, and Hellmann 2015; Carpentier and Suret 2015; Casey and O'Toole 2014; Cassar 2004; Cordova, Dolci, and Gianfrate 2015; Ferrando, Popov, and Udell 2017; Mamonov and Malaga 2018; Van Osnabrugge 2000). Therefore, for our purposes, asymmetric information constitutes a critical problem between a risk-bearing investor and a startup with few tangibles or little track record. The issue of asymmetric information is addressed by signaling efforts by the entrepreneur and screening activities by the investor to overcome an information gap and subsequently a finance gap (Davila, Foster, and Gupta 2003). Ameliorating such informational issues is conditional to reduce friction for capital acquisition in the market for entrepreneurial finance as a whole, which is a prerequisite for economic growth (e.g. Black and Gilson 1998; Gordon 2012; Jeng and Wells 2000).

Due to the principles of agglomeration of human and financial resources, access to such resources tends to be dependent on the location of the venture (Brown, Lambert, and Florax 2013; Harrison, Mason, and Robson 2010; Pelegrín and Bolancé 2008). Despite this tendency, the emergence of entrepreneurial activities and even high-growth firms have been found to be homogenously distributed geographically. The same holds for business angels (BAs), although the concentration of financial services (especially venture capital (VC) firms) benefits urban areas (Avdeitchikova and Landström 2005; Landström 2017, 35). BAs play an important role in startup financing, and their distribution seems to be more evenly distributed than VC firms. Furthermore, they tend to invest close to home (Avdeitchikova and Landström 2005; Guenther, Johan, and Schweizer 2018).

### 2.2. Development of hypotheses

In addition to offering the theoretical backdrop of the previous section, this paper describes the extension of an antecedent and exploratory case study of financial determinants among startups and stakeholders in the Norwegian market for entrepreneurial finance (Frimanslund 2022). The previous study identified a set of conditional factors, which were operationalized and tested from the entrepreneur's point of view in the present follow-up study. These factors are (1) the acceptance toward exits and buy-outs of regional startups and related jobs, (2) the availability of non-financial value-adding activities, (3) regional investor characteristics, and (4) regional startup culture.

#### 2.2.1. Attitudes toward exits

Most commercial investors enter a firm with the goal of making a profit by selling shares after a few years. Under normal market conditions, a high-growth and innovative startup with few tangibles and no track record would be seen as a high-risk project, but the risk exposure in such cases is accompanied by a significant potential profit from investor exit. Such non-organic growth depends on the entry and exit of risk takers and is a fundamental condition for efficient financial markets, entrepreneurship and economic growth in general. Even if a company was not expected to generate immediate profits, an anticipated increase in the firm's valuation would be a

sufficient reason to invest in the early phase. In the literature, exits normally refer to the exit of the founder. For our objective, we inquire about the possible link between perceived stakeholder attitudes toward exits. Policies on rural development often focus on the entrepreneur's function as a job creator. From that perspective, exits and buy-outs are perceived as threats to the long-term and stable employment that is often crucial for maintaining economic activity in rural areas and the rationale for regional policies (Frimanslund 2022). Therefore, we argue that job and value-oriented entrepreneurs may find the access to investor resources harder than growth-oriented entrepreneurs.

The role of exits seems to be rarely addressed in the literature on entrepreneurship in regional development. However, the characteristic of trust toward outsiders has been found to influence business innovativeness in Spanish high-income regions (Fernández-Serrano, Martínez-Román, and Romero 2019). Furthermore, Põder, Viira, and Värnik (2017) found that rural areas in Estonia had fewer entries and exits than urban regions, which might provide cross-contextual relevance to our study.

Theoretically, the stakeholder theory elaborates on the role of a broader base of firm interests (Freeman and McVea 2001), such as municipal governmental support agencies. In such cases, municipalities have been active in the firm's establishment or even as the provider of loans or guarantees. The explicit interests of rural municipalities are often to counteract the migration of industries and people. Therefore, we hypothesize that general predispositions toward exits in the broader regional ecosystem enhances the access to investors' non-financial value-adding activities. In this context, such activities refer to post-investment non-financial benefits such as strategic involvement, supervision or monitoring, resource acquisition or network access (Politis 2008). Such benefits are further explained in Section 2.2.2.

The insights above were operationalized and developed into nine hypotheses forming the specified model shown in Figure 1. The first hypothesis addresses the issue of sellouts versus long-term employment and operation.

**Hypothesis 1:** The more favourable an entrepreneur's and ecosystem's attitudes towards exit, the greater their access to the added values from investors.

### *2.2.2. Non-financial value added by investors*

The factor of value-adding activities related to investments is well described in the literature (Politis 2008). There are recent and notable examples of non-financial contributions of investors in related studies (e.g. the role of VC age and experience in Alperovych, Hübner, and Lobet 2015; Manigart, Baeyens, and Van Hyfte 2002). For example, investors are often individuals with specific growth, sector or technology competencies that can be sought out by entrepreneurs. According to the pecking-order framework (Myers and Majluf 1984), selling equity shares is considered a last resort for external financing. However, we argue that capital-intensive and innovative high-growth firms typical of those in high-growth business ecosystems may prefer such investments at an early stage as a deliberate strategy to acquire critical non-financial values. This key dynamic is conceptualized as feedback loops in Isenberg (2011) and contextualized within a bounded business ecosystem in Spigel and Harrison (2018). We therefore examine these issues, as the sampled firms were

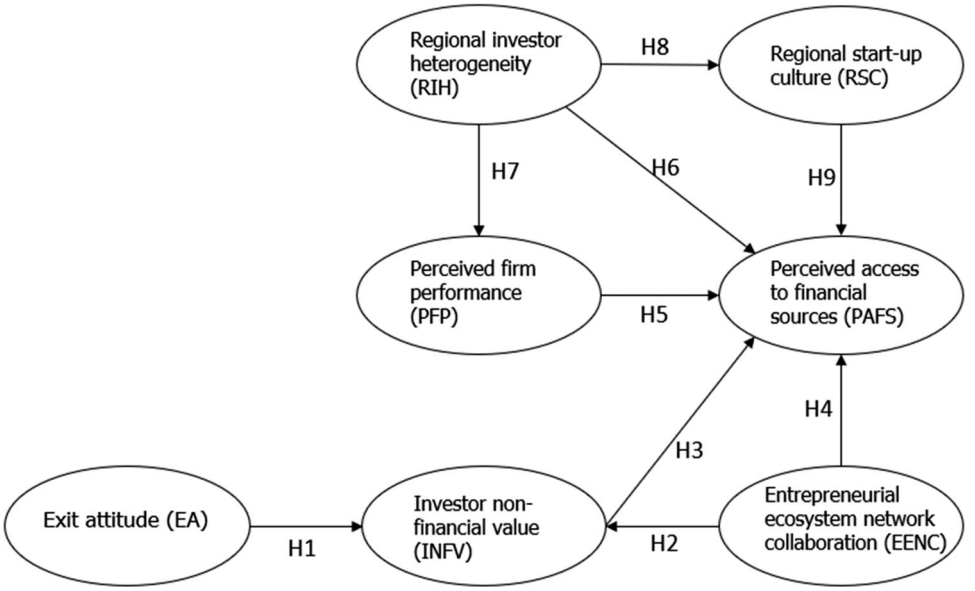


Figure 1. Specified model of access to entrepreneurial finance.

associated with such ecosystems and thus were expected to be able to harvest such resources from the system. Logically, the same holds for how a startup perceives access to investor finance. Such hypotheses rest on the theoretical basis of asymmetric information and signaling in that active ecosystem participation may improve signaling and reduce asymmetric information. Based on the above, and central to the principles of the process theory of entrepreneurial ecosystems, we hypothesize that a business ecosystem collaboration, whether it is a startup hub, co-working space, incubator or cluster, enhances access to non-financial value-adding activities such as growth and commercialization competencies, governance and legitimacy. According to the representative non-ecosystem literature regarding the Norwegian context and in line with the principles of agglomeration, the ability to scale is a characteristic mostly of the few strong and urban business clusters, and a critical mass of the cluster (or ecosystem) must be met to attract external venture capital (Reve 2017). H2 to H4 address ecosystem collaboration.

**Hypothesis 2:** Firms that engage in ecosystem collaboration experience better access to non-financial value.

**Hypothesis 3:** Firms that have received additional non-financial value experience better access to financial sources in general.

**Hypothesis 4:** Ecosystem collaboration or association improves perceived access to financial resources.

The next hypothesis addresses the influence of firm performance on perceived financial availability. This factor is relevant to market gaps in entrepreneurial finance (e.g. Murray 2007). In the case of early high-growth and innovative startups, measurements of financial performance do not tell a clear story. Individually, sales, profits,

and employment are not sufficient measures of firm performance, nor are already acquired equity or debt, although they might provide an external and objective assessment of the firm's potential. In the absence of useful 'hard KPIs,' indicators of progress have emerged to as an alternative to assess startup performance. Because it is so difficult to measure startup performance, we therefore inquire about the self-perceived performance of the firm and its relationship with access to finance. This implies subjective evaluations of performance, acquisition efforts and growth projections by the respondents.

**Hypothesis 5:** Perceived firm performance improves perceived financial access in the regional ecosystem.

### 2.2.3. The characteristics of regional investors

The BA market can be regarded as a local market (Harrison, Mason, and Robson 2010) and consists of individuals who may make contributions beyond the financial (Politis 2008). This raises the question of whether regional characteristics apply between regions with weak investor environments (presumably rural) and more affluent areas. Unfortunately, we were unable to find an answer to this question in the literature. The antecedent case study reported above indicated that homogenous rural business sectors tend to have a narrower variety of investors for unrelated technologies. Therefore, the characteristics and industry specificity of the investors are considered to be a hindrance to financial access (Frimanslund 2022).

**Hypothesis 6:** The regional heterogeneity of investor competencies improves perceived access to finance.

**Hypothesis 7:** The regional heterogeneity of available investor competencies improves perceived firm performance.

Subsequently, the next factor under examination is the extent to which the available investors are familiar with and understand new business ideas (i.e. the tolerance and acceptance of new and independent business ideas in the region). This factor may be reflected by the agglomeration principles or thinness of the market (Nightingale et al. 2009). Specifically, the regional homogeneity of business sectors may lead to homogenous investor availability. According to the abovementioned case study, investors tend to favor sectors that lie within their expertise. Therefore, even though investors may be evenly distributed geographically (Landström 2017, 36), the expertise of available investors may not match the sector of the innovative startup. The informants of the case study referred to this as a '*sectorial barrier*' to private investment. Furthermore, they believed that such regional investor heterogeneity influenced the perceived economic impact on the firm.

**Hypothesis 8:** The regional heterogeneity of available investor competencies is positively associated with the culture for regional start-ups.

### 2.2.4. Regional startup culture

Defining a startup culture may be challenging, but researchers seem to converge toward a common notion. For instance, Muñoz and Kimmitt (2019) refer to a presumed rural, lively and supportive culture for entrepreneurship where 'the idea' of

Table 1. Measurements.

| Constructs | Measurements | Theoretical justification |
|---|---|---|
| INFV | UK Community Innovation Survey | |
| PFP | UK Community Innovation Survey | |
| RSC | GEM (2016b) | |
| PAFS | Bastesen and Vatne (2014) | Frimanslund (2022) |
| EENC | | Frimanslund (2022), Spigel and Harrison (2018) |
| EEA | | Frimanslund (2022), Spigel and Harrison (2018) |
| RIH | | Frimanslund (2022), Spigel and Harrison (2018) |

risk ventures is cultivated. North and Smallbone (2006) describe 'entrepreneurial culture' as linked with 'entrepreneurial education.' Together, they indicate public awareness of, and support for, entrepreneurship which is the likely product of an industrial tradition in the region. Therefore, in this context, we define regional startup culture as the regional tradition of public knowledge of, and support for, high-risk growth ventures. This factor is related to exit attitudes but focuses on proclivities among stakeholders toward uncertain and risky growth-oriented entrepreneurship over large-scale industries or agricultural sectors. Similar to the above, in the antecedent case study, a lack of entrepreneurship knowledge, history and culture was reported to be a barrier to financial access in many regions.

**Hypothesis 9:** Regional start-up culture improves perceived access to financial sources.

### 2.3. Dependent variable and research model

We choose access to finance as our dependent variable. Respondents were asked questions about whether they required/acquired external sources of finance, and which type they preferred. Access to finance was measured by asking about perceived access to finance for the firm and questions about the regional availability of external finance on a 5-point Likert scale. As Table 1 shows, the survey began by asking about the perceived access to finance in general before asking about specific sources of growth finance. There does not seem to be an established way to measure access to finance, especially for capital-intensive startups. Some of the most prominent literature related to the topic has probed for obstacles (Beck and Demirguc-Kunt 2006; Beck et al. 2006) or the regional concentration of VC (Martin et al. 2005; Mason 2010). Lee, Sameen, and Cowling (2015) differentiated between whether the startup obtained all, some or no finance from the first source firms tried and whether it received funding from any source at all. We choose a different strategy, one in which the survey first asked about perceived access to external finance in general and then followed up by asking about the specific sources. These questions were paired with questions about attempted/planned use and actual use of resources. The hypotheses are illustrated in the specified conceptual model in Figure 1.

## 3. Data and methodology

In this study, we set out to examine a set of determinants of perceived access to finance. To explore our hypotheses and empirically test them, we distribute a survey

to innovative and growth-oriented startups in rural and urban areas of Norway. The following section explains the sample and data collection procedures and how the dependent and independent variables were constructed.

### 3.1. Context: entrepreneurship in Norway

In some areas of innovation, Norway has been outperformed by its Nordic neighbors, as measured by innovation indices (GEM 2016a; Indikatorrapporten 2016). The reasons are understudied but are assumed complex. Factors such as a well-developed safety net for the unemployed, a dominant oil sector and a traditional lack of cultural acceptance for risk takers may discourage entrepreneurs (Reve 2017). The issue of financial support is undoubtedly important. Research on this issue is scarce; however, in a recent governmental report, it was posited that the challenges for startup finance in Norway are more related to overcoming certain barriers than to a lack of available financing (Kapitaltilgangsutvalget 2018).

### 3.2. Sampling procedure

The selected sampling strategy was to compile the names of firms and contacts from entrepreneurial business ecosystems such as hubs, incubators, science parks, accelerators and co-working spaces for eligible participants, supplemented with the names of personal contacts of the researchers involved in the project. A questionnaire was developed to inquire about perceived access to different financial resources, the actual use of various resources, and possible explanatory variables. Most of the topics emerged in a preceding case study of rural and urban stakeholders in the Norwegian market for entrepreneurial finance (Frimanslund 2020). Using various public sources to identify potential respondents allowed us to avoid survivorship bias by identifying startups that may have been terminated (Brown et al. 1992).

The questionnaire was sent to a sample of 542 potential respondents during 2019 and early 2020, and 131 complete responses (24%) were received in total after two reminders. The population of growth-oriented Norwegian startups is limited, so multiple sources (co-founders/CEOs) were included, not only to obtain data but also to overcome potential single-source bias (Avolio, Yammarino, and Bass 1991). Among our set of respondents, eight firms had multiple respondents. One firm had three respondents; the rest had two. Nevertheless, for the majority of firms, responses were obtained from only one respondent.

Firms registered under NACE code 62010 (programming services) provided 42% of the responses and a larger share were registered with similar codes related to IT and development. Using self-reporting, 17.6% reported a rural location, whereas based on an objective Eurostat zip-code classification, 23% were categorized as mostly rural, 39% intermediate, and 38% mostly urban. The difference is likely because most Norwegian cities are too small to be considered urban, according to Eurostat.

When it comes to the age and size of the firms, the questionnaire included self-reported date of establishment and number of employees. In addition, we have manually gathered financial information about size and capitalization from public records

Table 2. Self-reported geographic distribution.

| Urban/rural | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Valid percentage | Cumulative percentage |
| Valid | Rural | 24 | 17.6 | 18.3 | 18.3 |
| | Urban | 107 | 78.7 | 81.7 | 100.0 |
| | Total | 131 | 96.3 | 100.0 | |
| Missing | System | 5 | 3.7 | | |
| Total | | 136 | 100.0 | | |

in our dataset. However, the selection criteria included only growing startups associated with entrepreneurial milieus, which allowed for including every respondent (Table 2).

All analyses were conducted using IBM SPSS 26 with maximum likelihood estimation and AMOS. Prior to conducting confirmatory factor analysis, we ensure that the data do not include an inordinate number of missing values, and we test for item internal consistency and construct reliability. A missing value analysis within the item set reveals missing values ranging from a low of 7.4% to a maximum of 9.6%. No particular items are revealed to be outliers, and all are within acceptable range. Missing values are replaced with the series mean (Kline 2015).

SEM incorporates two principal components: (a) a measurement model and (b) a structural model. The measurement model is used to test the hypothesized model arrived at from theory and estimate the population covariance matrix with the aim of minimizing the difference between the estimated and observed matrices (Schreiber et al. 2006). The measurement model is intended to test the interrelationships and extent of covariation of the latent constructs. In addition, the factor loadings, variances, and modification indices (if used) from the measurement models can inform decisions regarding the exclusion of any variables and the optimal set of latent variables prior to estimating the structural model (Schreiber et al. 2006). The seven unobserved variables in the initial measurement model taken were entrepreneurial ecosystems network collaboration (EENC, or 'ecosystem collaboration' in the text), exit attitude (EA), investor non-financial value (INFV, or 'investors' added values' in the text), perceived firm performance (PFP), regional investor heterogeneity (RIH), perceived access to financial sources (PAFS), and regional startup culture (RSC). The dimensionalities of each of these constructs were measured by several (observed) indicators. The initial measurement model was constructed with the seven unobserved or latent variables and twenty-nine observed variables stemming from the questionnaire survey.

As mentioned in Section 2, the selected variables were derived mainly from an antecedent case study of startups and stakeholders of the Norwegian market for entrepreneurial finance. As we aim to examine proposed relations that were novel to the literature, we establish measures of several factors that were not identified in our literature searches. We therefore rely on theory in generating some of the measures used in this survey.

### 3.3. Measurements

There is no authoritative definition of a startup ecosystem other than an association of growth-oriented firms, and there is no consensus regarding how growth should be

measured (Bastesen and Vatne 2014; Delmar 2006). The most notable operationalisations of entrepreneurial ecosystems adopt a geographic approach (see Stam 2018; Vedula and Kim 2019) and do not apply to our case. Accordingly, the measure ecosystem collaboration was derived directly from Frimanslund (2022) and was theoretically rationalized by the recent process theory of Spigel and Harrison (2018). In addition, the measures exit attitudes and regional investor homogeneity were created in this study, which have to our knowledge not been measured in other contexts. Regarding the investors' added values and perceived firm performance, the UK Community Innovation Survey was consulted for measures of non-financial value and performance, which were adapted to fit the specific context of this research. Various questions about financial sources and introductory questions about firm characteristics were imported from Bastesen and Vatne (2014). Because no existing measures available to us could assess all of the factors we wished to investigate, we employ a larger range of items from various sources (such as GEM 2016b) to assess aspects such as cultural and regional issues.

While the choice of self-created measures certainly can be taken as a potential weakness for the establishment of the proposed relational model, all three scales were found to pass the construct and scale reliability thresholds, as well as met the convergent and discriminant validity conditionalities (see Tables 3 and 4). As such, we view the introduction and application of the scales as laying a foundation for further empirical testing and usage in this regard while filling an instrumental gap.

### 3.4. Inter-item reliability, construct reliability, convergent, and discriminant validities

Cronbach and Meehl (2017) described four types of validity: predictive and concurrent, which can be considered together as criterion-oriented, content, and construct. Criterion-oriented validity is ensured through methodological design. Content validity is ensured by conducting a thorough literature review and defining and establishing what Cronbach and Meehl (2017) term the relevant 'universe of items' and choosing from within such a universe. A discriminant validity analysis is conducted to ensure construct validity, i.e. that measures of one theoretical construct are not similar to the measures of another theoretical construct (Schreiber et al. 2006; Voorhees et al. 2016).

Table 4 in Appendix 1 shows the inter-construct correlations with average variances extracted for each in the shaded cells, and Table 3 shows all inter-item correlations. Items include the paired down set of items (22 down from 35) selected after the initial and reassessed measurement model. Four of the six correlations among the latent variables are significant and range between 0.85 and 0.1 (Kline 2015). This result indicates that the discriminant validity conditionalities are supported for the related constructs. Additional confirmation is obtained by comparing the square root of the average variance extracted (AVE) to the inter-construct correlation values. The square root of AVE is greater than the inter-construct correlations in all cases, indicating that the discriminant validity conditionalities are met (Fornell and Larcker 1981). As such, although not all constructs meet all the criteria for discriminant validity, they are retained for further investigation.

Table 3. Inter-item correlations.

Inter item correlations

| | PAEC | PABL | PAPI | PAPE | EA1 | EA2 | EA3 | EA4 | EA5 | INFVM | INFVK | INFVN | INFVL | EENC1 | EENC2 | EENC3 | RIA1 | RIW1 | RIW2 | PISLG1 | PISLG2 | PISLG4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PAEC | 1 | | | | | | | | | | | | | | | | | | | | | |
| PABL | ,456** | 1 | | | | | | | | | | | | | | | | | | | | |
| PAPI | ,659** | ,534** | 1 | | | | | | | | | | | | | | | | | | | |
| PAPE | ,428** | ,332** | ,387** | 1 | | | | | | | | | | | | | | | | | | |
| EA1 | 0,006 | 0,029 | 0,041 | 0,006 | 1 | | | | | | | | | | | | | | | | | |
| EA2 | −0,117 | −0,082 | −0,08 | −0,072 | ,531** | 1 | | | | | | | | | | | | | | | | |
| EA3 | −0,027 | −0,131 | −0,053 | −0,068 | ,349** | ,479** | 1 | | | | | | | | | | | | | | | |
| EA4 | −0,02 | −0,156 | −0,122 | −0,092 | ,386** | ,556** | ,679** | 1 | | | | | | | | | | | | | | |
| EA5 | 0,032 | −0,09 | −0,052 | −0,138 | ,477** | ,528** | ,594** | ,685** | 1 | | | | | | | | | | | | | |
| INFVM | 0,132 | 0,015 | 0,164 | 0,098 | 0,075 | −0,067 | −,177* | −,170* | −0,134 | 1 | | | | | | | | | | | | |
| INFVK | 0,162 | 0,125 | ,233** | ,209* | −0,011 | −0,056 | −0,099 | −0,09 | −0,115 | ,791** | 1 | | | | | | | | | | | |
| INFVN | ,247** | 0,12 | ,313** | ,227** | 0,058 | −0,104 | −0,122 | −0,066 | −0,041 | ,708** | ,719** | 1 | | | | | | | | | | |
| INFVL | ,224** | 0,109 | ,309** | ,234** | −0,053 | −0,155 | −,184* | −0,131 | −0,09 | ,591** | ,561** | ,716** | 1 | | | | | | | | | |
| EENC1 | −0,103 | −0,045 | −0,047 | 0,053 | −0,018 | 0,087 | 0,043 | −0,057 | 0,014 | 0,094 | ,171* | ,196* | 0,119 | 1 | | | | | | | | |
| EENC2 | 0,026 | −0,027 | 0,038 | 0,079 | 0,025 | −0,029 | 0,045 | 0,069 | 0,004 | 0,103 | 0,167 | ,169* | 0,075 | ,470** | 1 | | | | | | | |
| EENC3 | 0,009 | −0,049 | −0,011 | 0,15 | 0,053 | ,169* | −0,032 | 0,015 | 0,155 | 0,121 | ,184* | 0,161 | 0,097 | ,558** | ,439** | 1 | | | | | | |
| RIA1 | ,284** | ,185* | ,302** | ,202* | −0,06 | −0,074 | 0,042 | −0,085 | −0,12 | −0,043 | −0,042 | 0,041 | 0,11 | 0,103 | 0,038 | 0,07 | 1 | | | | | |
| RIW1 | ,363** | ,338** | ,484** | ,415** | −0,035 | −0,072 | −0,003 | −0,097 | −0,11 | −0,082 | −0,036 | 0,091 | 0,102 | 0,095 | 0,065 | ,178* | ,521** | 1 | | | | |
| RIW2 | ,214* | ,206* | ,298** | 0,163 | −0,134 | −0,137 | −0,105 | −,208* | −0,136 | −0,043 | 0,077 | 0,163 | 0,094 | 0,131 | 0,065 | 0,154 | ,422** | ,518** | 1 | | | |
| PISLG1 | −,510** | −,293** | −,460** | −,265** | −0,033 | −0,028 | −0,07 | −0,024 | −0,069 | −0,06 | −0,078 | −0,078 | −0,13 | 0,051 | −0,027 | 0,026 | −,171* | −,333** | −0,121 | 1 | | |
| PISLG2 | −,521** | −,196* | −,431** | −,185* | −0,028 | −0,026 | −0,116 | −0,054 | −0,084 | 0,012 | 0,018 | −0,049 | −0,14 | 0,096 | 0,039 | 0,04 | −,174* | −,287** | −,192* | ,857** | 1 | |
| PISLG4 | −,416** | −0,139 | −,292** | −,208* | 0,008 | −0,028 | −0,054 | −0,091 | −0,056 | 0,045 | 0,078 | −0,007 | −0,02 | 0,052 | 0,079 | 0,007 | −0,136 | −,264** | −0,125 | ,608** | ,683** | 1 |

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 4. Inter-construct correlations with the square root of AVE.

| | PAFS | EA | INFV | PFP | EENC | RIH | RSC | Mean | SD |
|---|---|---|---|---|---|---|---|---|---|
| PAFS | 0.697 | | | | | | | 2.59 | 0.92 |
| EA | −0.098 | 0.731 | | | | | | 2.39 | 0.81 |
| INFV | 0.267** | −0.131 | 0.828 | | | | | 3.77 | 0.93 |
| PFP | −0.478** | −0.073 | −0.045 | 0.859 | | | | 3.95 | 1.02 |
| EENC | 0.002 | 0.051 | 0.194* | 0.056 | 0.704 | | | 3.82 | 0.94 |
| RIH | 0.457** | −0.136 | 0.049 | −0.274** | 0.145 | 0.705 | | 3.14 | 0.95 |
| RSC | 0.298** | −0.138 | 0.103 | −0.14 | −0.123 | 0.378** | 0.637 | 3.13 | 0.79 |

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

The internal consistency of measures is assessed through composite construct reliability (CR). Table 4 shows the composite CR values and the average variance tabulations. All composite CR values are above the recommended threshold value of 0.6 (Bagozzi and Yi 2012). Thus, the scale shows acceptable reliability across constructs and items.

Convergent validity can be ensured by measuring AVE. Fornell and Larcker (1981) recommend AVE= >0.5 as the threshold for acceptable convergent validity. All constructs except regional startup culture and perceived access to financial sources show an AVE equal to or above 0.5, satisfying the convergent validity criterion (Table 5). In the case of perceived access to financial sources, a value of 0.49 is obtained, which is considered satisfactory for retention of the construct. However, for regional startup culture, an AVE of 0.41 is obtained, leading us to drop the construct from our final model.

### 3.5. Difference between urban and rural groups

Of the 132 respondents, 12 had categorized themselves as rural, and the rest as urban. Despite the preponderance of firms categorizing themselves as urban, it is prudent to test whether there is significant difference between the two categories. An independent samples t-test was administered using rural versus urban as the grouping variable. The average summated scores for regional investor heterogeneity (RIH), perceived firm performance (PFP), access to financial sources (PAFS), exit attitude (EA), investor non-financial value (INFV), ecosystem network collaboration (EENC), and regional startup culture (RSC) were taken as the test variables. The results of the independent t-test are presented in Table 6:

Except for the case of PAFS (public access to financial resources), the two tailed significance value is over 0.05, indicating there are no differences between the urban and rural firms in terms of the respective variables. It should be noted that PAFS is the outcome variable in our proposed model. The test indicates there is no significant difference in perception of the antecedents among the rural and urban firms, yet there is a difference in their perception of availability of finance, depending on whether they are located rurally or in urban settings. As noted earlier, we do have a skewed response set, with rural being only 10% of the overall firms. Keeping this in mind, there is a need for further research as to why rural firms may feel left out when it comes to access to finance.

Table 5. Construct reliability and AVE.

| | | STD. Regr. Weight | SQRD. Mult. Correlation | 1 – SQRD Mult. correl. | Construct Reliability | Average variance Extracted | Square root of AVE |
|---|---|---|---|---|---|---|---|
| EENC | EENC1 | 0.77 | 0.59 | 0.41 | 0.74 | 0.50 | 0.704 |
| | EENC2 | 0.60 | 0.36 | 0.64 | | | |
| | EENC3 | 0.74 | 0.54 | 0.46 | | | |
| EA | EA1 | 0.53 | 0.28 | 0.72 | 0.85 | 0.54 | 0.731 |
| | EA2 | 0.67 | 0.45 | 0.55 | | | |
| | EA3 | 0.76 | 0.57 | 0.43 | | | |
| | EA4 | 0.85 | 0.72 | 0.28 | | | |
| | EA5 | 0.81 | 0.65 | 0.35 | | | |
| INFV | INFVM | 0.86 | 0.74 | 0.26 | 0.90 | 0.69 | 0.828 |
| | INFVK | 0.87 | 0.75 | 0.25 | | | |
| | INFVN | 0.85 | 0.73 | 0.27 | | | |
| | INFVL | 0.72 | 0.52 | 0.48 | | | |
| PFP | PISLG1 | 0.90 | 0.80 | 0.20 | 0.89 | 0.74 | 0.859 |
| | PISLG2 | 0.96 | 0.92 | 0.08 | | | |
| | PISLG4 | 0.71 | 0.50 | 0.50 | | | |
| RIH | RIW1 | 0.87 | 0.75 | 0.25 | 0.74 | 0.50 | 0.705 |
| | RIW2 | 0.61 | 0.37 | 0.63 | | | |
| | RIA1 | 0.61 | 0.37 | 0.63 | | | |
| RSC | RSC1 | 0.65 | 0.42 | 0.58 | 0.66 | 0.41 | 0.637 |
| | RSC2 | 0.48 | 0.23 | 0.77 | | | |
| | RSC3 | 0.75 | 0.57 | 0.43 | | | |
| PAFS | PAEC | 0.79 | 0.62 | 0.38 | 0.78 | 0.49 | 0.697 |
| | PABL | 0.59 | 0.35 | 0.65 | | | |
| | PAPI | 0.85 | 0.72 | 0.28 | | | |
| | PAPE | 0.51 | 0.26 | 0.74 | | | |

Table 6. Difference between rural and urban groups.

| Variable | Levene's test sig value | Equal variances assumed | T values | Sig. (2 tailed) |
|---|---|---|---|---|
| PAFS | 0.967 | Yes | 2.307 | 0.023 |
| EA | 0.055 | Yes | 1.742 | 0.084 |
| INFV | 0.051 | Yes | −.289 | 0.773 |
| PFP | 0.616 | Yes | −1.679 | 0.095 |
| EENC | 0.661 | Yes | 1.046 | 0.298 |
| RIH | 0.911 | Yes | −.688 | 0.492 |
| RSC | 0.396 | Yes | −1.640 | 0.103 |

### 3.6. Testing for common method biases

There is a chance of common method bias occurring when the measured variance is due to the method used rather than to the constructs the measures represent (Podsakoff et al. 2003; Podsakoff, MacKenzie, and Podsakoff 2012). To ensure the measured variances can be attributed to the constructs rather than the method, three different methods have commonly been applied in literature, namely Harman's single factor test, introducing a common latent factor (CLF) and a common marker variable test. The Harman single factor test however is less often taken to ascertain common method bias these days. As such, we opt to run the common latent factor (CLF) test and test using common marker variables.

#### 3.6.1. Test introducing common latent factor (CLF) and common marker variables

The test is conducted by introducing a new (common) factor, drawing paths to all existing variables, and assigning the paths a common parameter constrain (here, a). Variance constraint for the common factor is set to 1. Running the simulation in

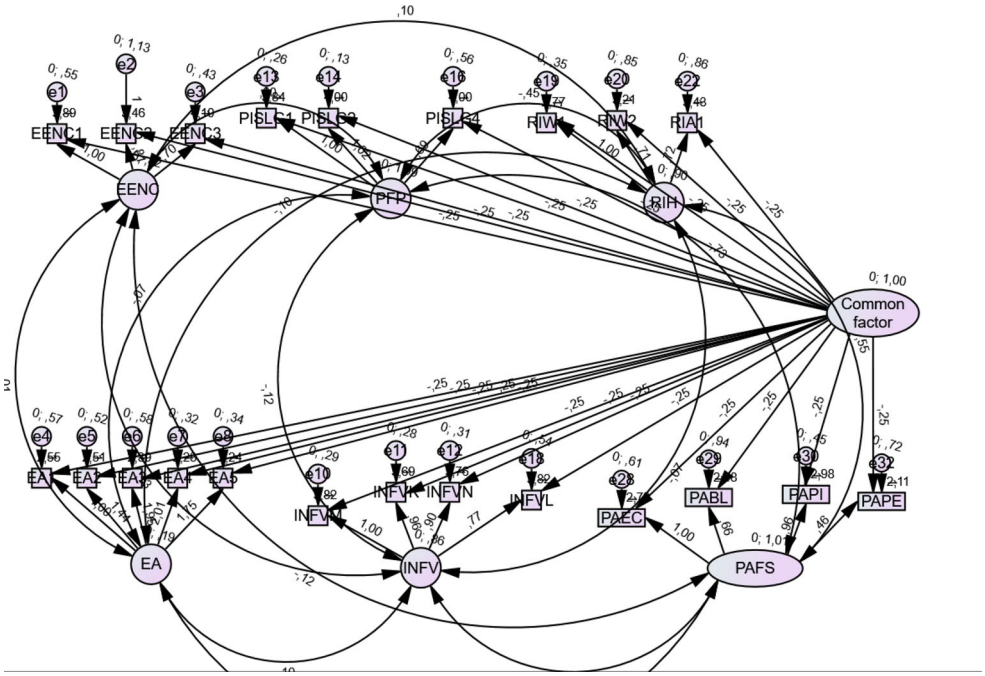


Figure 2. Common method bias test introducing Common latent factor (CLF).

AMOS, the common variance between the selected variables comes to (−0.25)2 or 0.0625 (or about 6.25%) (see Figure 2). Since the value of the square of unstandardized path coefficients is below 0.50, we can be assured that common method bias is not a problem among the factors chosen for the structural equation model.

However, we can test further by adding a common marker variable and check whether it reduces the common variance, confirming lack of common method bias. We add RSC as a common marker and drawing covariances with the other latent factors and restricting path to the earlier introduced common factor, we now find common variance reduced to (−0.22)2 or 0.048 at less than 0.5 (see Figure 3); further confirming the absence of any common method bias.

### 3.7. Specifying the measurement model

An initial measurement model (CFA) was run with the seven constructs and the 35 items used to measure them. Examples of the survey items can be seen in Appendix 1. A measurement model allows for the assessment of correlations among all variables specified from the hypothesized model, and can assess the fit between the measurement items and the data. It can also guide decisions as to whether items should be removed. Chin and Todd (1995) suggest caution in this regard, since an enthusiastic removal of items to obtain a better model fit can lead to overfitting of the model to the data. A common approach is to remove items with standardized path loadings below 0.5 (Chin 1998). Items with low loadings were removed, leading to improved model fit, with the following fit indices: $\chi 2/df = 1.69$, CFI = 0.853, NFI = 0.709, and

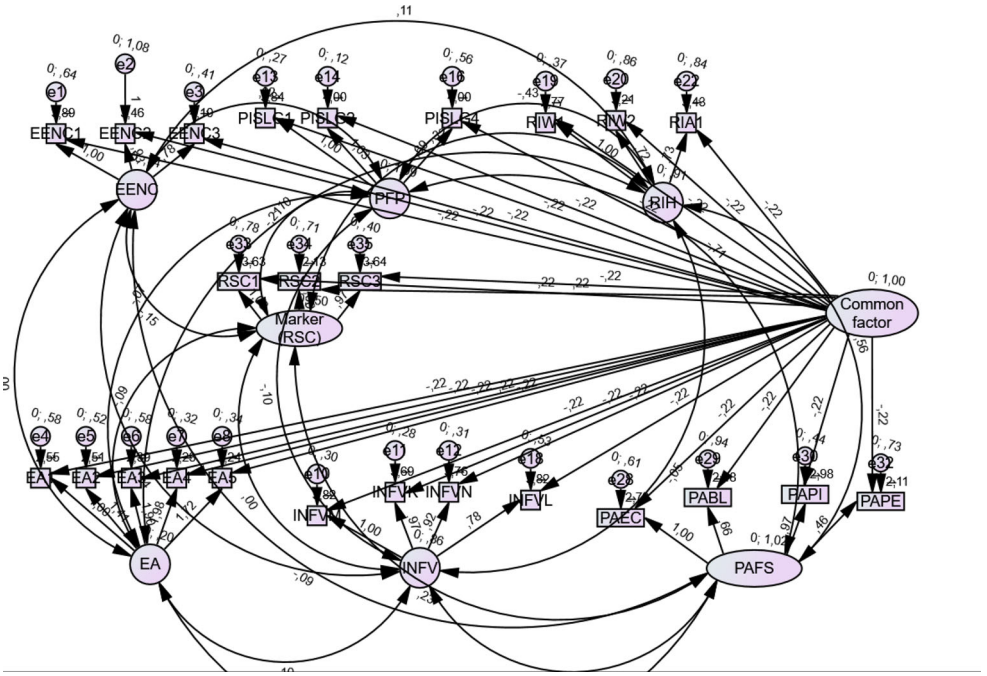


Figure 3. Common method bias test using common marker variable.

RMSEA = 0.071. The decision to remove items should be cross-checked with the ensuing AVE, and items retained for constructs should result in AVE > 0.5 to satisfy convergent and discriminant validity. Within the set of items in the measurement model, items were further paired down, retaining only those that satisfied the conditionalities of convergent and discriminant validity and had associated standardized path loadings of over 0.5 (Figure 4).

The reassessed measurement model including the selected items (Figure 2) showed an improved model fit, with the following fit indices: $\chi 2/df = 1.34$, CFI = 0.951, NFI = 0.836, and RMSEA = 0.050. In particular, the construct RSC and its associated items were removed from the model because they failed to satisfy convergent validity conditionalities. The removal of the construct invalidates hypotheses H8 and H9 and excludes them from further consideration. The remaining seven hypotheses and the relational model are examined further.

Although regional startup culture is no longer considered part of the model or validation, we tested the relationships of regional startup culture with other constructs separately in alternative measurement and SEM models. The tests showed no significant relationship of regional startup culture with perceived access to financial sources, the dependent variable. However, there is a strong indication of a relationship between regional startup culture and regional investor heterogeneity. This indicates that extant regional startup cultures do not exert any influence on the perceived access of startups to financial sources; however, the construct remains present through the accumulation of local investor characteristics. A closer scrutiny of this subset of relationships in future research is recommended.

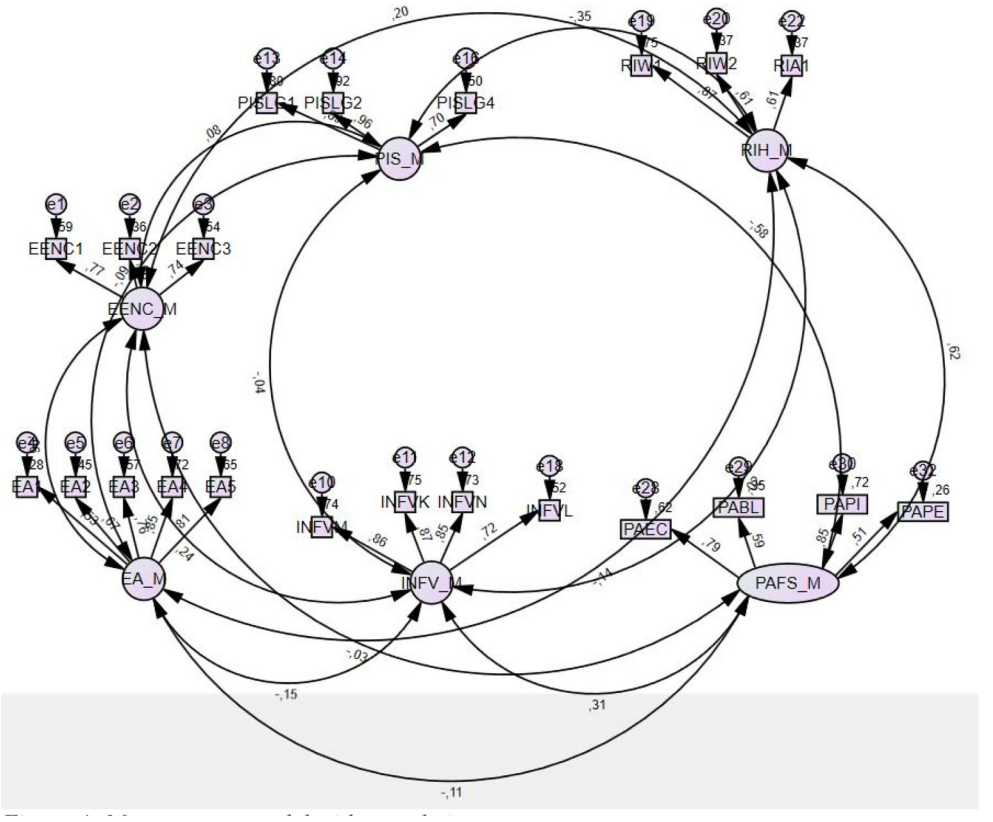


Figure 4. Measurement model with correlations.

### 3.8. Structural model

A structural equation model is used to simultaneously test the hypothesized relationships among all variables specified in the measurement model. The model is run specifying causal relationships among the latent variables and helps identify the causal effects and explained and unexplained variances of the constructs (Jöreskog and Sörbom 1996; Schreiber et al. 2006). The model fit indices indicate how well the model fits the data, and ideally, a well-specified measurement model should lead to a well-fitted structural equation model without having to resort to usage of modification indices (Figure 5).

Table 7 below summarizes the goodness-of-fit indices of the structural model, and the results of the tested hypotheses are presented in Table 8.

The goodness-of-fit indices indicate that the indices fall within acceptable ranges (Hu and Bentler 1999), and the model shows good fit (RMSEA 0.051). These results indicate that the conceptualized model provides a good fit to the observed data. Seven hypotheses were tested with the structural model and were accepted or rejected based on the path coefficient ($\beta$) values and associated t values. The acceptable t-value threshold is $t > 1.96$ for $p < 0.05$ and $t > 2.33$ for $p < 0.01$ (Kline 2015). Table 8 summarizes the test results of the hypothesized paths, critical ratio/t values, and conclusions regarding acceptance or rejection of the hypotheses.

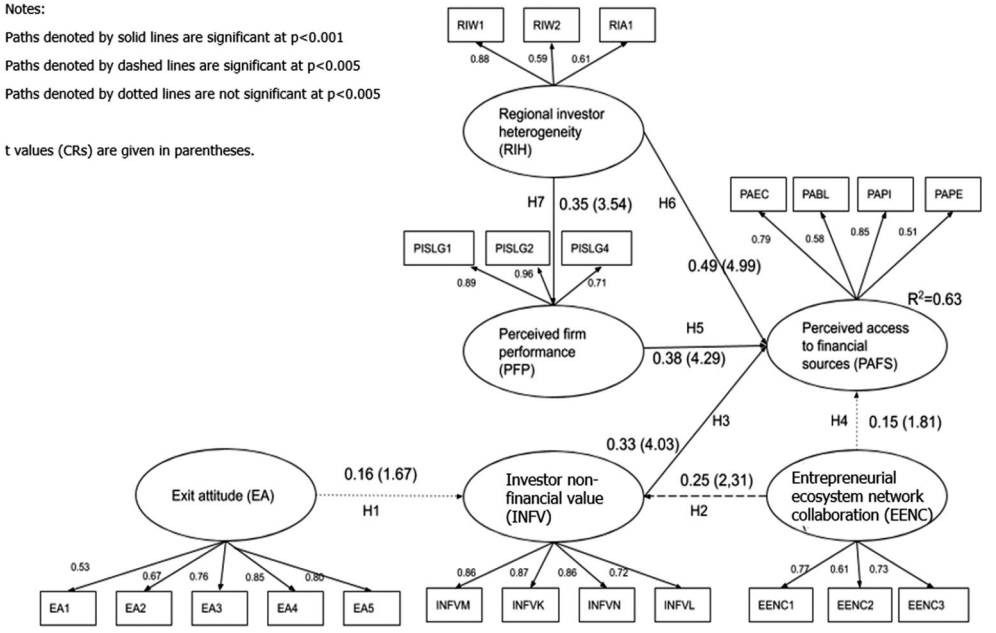


**Figure 5.** Structural model and path values.

Table 7. Goodness of fit metrics.

| Goodness of fit | Criterion | Value | |
|---|---|---|---|
| $\chi^2$ test | | | |
| $\chi^2$ | $p > 0.05$ | 271.56 | ($p < 0.01$) |
| $\chi^2$/df | <5 | 1.34 | |
| Fit indices | | | |
| CFI | >0.9 | 0.948 | |
| NFI | >0.9 | 0.828 | |
| RMSEA | <0.08 | 0.051 | |
| Hoelter at 0.05 | >100 | 118 | |
| Hoelter at 0.01 | >100 | 126 | |

Table 8. Hypothesis test results.

| Hypothesis test results | | Standardised path coefficient (β) | Standard error (S.E.) | Critical ratio (t value) | Result |
|---|---|---|---|---|---|
| H1 Exit attitude | → Investor non-finance value | 0.163 | 0.189 | 1.673 | Not supported at $p < 0.05$ |
| H2 Entrepreneurial ecosystem network collaboration | → Investor non-finance value | 0.248 | 0.106 | 2.306 | Supported at $p < 0.05$ |
| H3 Investor non-finance value | → Perceived access to financial sources | 0.326 | 0.087 | 4.029 | Supported at $p < 0.001$ |
| H4 Entrepreneurial ecosystem network collaboration | → Perceived access to financial sources | 0.155 | 0.093 | 1.814 | Not supported at $p < 0.05$ |
| H5 Perceived firm performance | → Perceived access to financial sources | 0.383 | 0.086 | 4.294 | Supported at $p < 0.001$ |
| H6 Regional investor heterogeneity | → Perceived access to financial sources | 0.495 | 0.099 | 4.988 | Supported at $p < 0.001$ |
| H7 Regional investor heterogeneity | → Perceived firm performance | 0.352 | 0.103 | 3.535 | Supported at $p < 0.001$ |

Of the seven hypotheses tested, two are not supported. A significant relationship could not be found between either the exit attitudes of firms and investors' added values ($\beta = 0.16$, $t = 1.67$) or ecosystem collaboration and perceived access to financial sources ($\beta = 0.155$, $t = 1.81$). Ecosystem collaborations do not entail access to finance. Regional investor heterogeneity is found to have a strong influence on perceived access to financial sources ($\beta = 0.495$, $t = 4.98$) and a moderate influence on perceived firm performance ($\beta = 0.35$, $t = 3.53$). Perceived firm performance is found to have a strong influence on perceived access to financial sources ($\beta = 0.38$, $t = 4.29$). A moderate to strong relationship is found between investors' added values and perceived access to financial sources ($\beta = 0.33$, $t = 4.03$).

## 4. Findings and discussion

According to Isenberg (2011), feedback loops, such as spillover effects, of realized entrepreneurial success can benefit other entrepreneurs in nascent or earlier phases. Financial and non-financial effects such as inspiration, capital re-investments and experience could foster entrepreneurship within the proximity of a key actor. These feedback loops are what Spigel and Harrison (2018) refer to as recycling of entrepreneurial resources. We need to know more about the nature of such dynamics (Audretsch et al. 2018).

The present study was conducted as an attempt to learn about such dynamics. The results of this study confirm several of the determinants of perceived financial access, as proposed by Frimanslund (2022). However, the results do not support our expectation regarding how stakeholder attitudes toward exits and potential relocation of ventures affect access to non-financial resources (H1).

With regard to H2, we found weak support for a relation between the degree of network collaboration and access to non-financial value. This hypothesis in itself is not a controversial one; the relationship between network collaboration and access to resources lies at the basis of most systemic innovation and entrepreneurship theories. We suspect that the weakness of the relationship might have been due to our sample, which contained many nascent and new ventures. The low absorptive capacity and network abilities of such new teams have been found to reduce the net benefits of network activities (Witt 2004), which we assume is the case for many of our respondents. Furthermore, Witt found an inverse U-shaped relationship between the size or diversity of founders' networks and the harvested benefit. This finding suggests that perhaps many of our respondents had not yet sufficiently matured or were not yet fully equipped to fully exploit the potential of their networks, hence the weak relation.

Furthermore, we found support for H3: that utilization of non-financial resources increases perceived access to external funding. This finding is in line with previous research, where BAs in particular are expected to add non-financial value to a firm. Across regions, BAs have frequently been found to have a startup background (see a comparison in Politis 2008, 129), although to a lesser extent in Norway (Sørheim 2003). We found support for our view in a US study of Wasserman (2017), which revealed that for each level a founder gives up (i.e. control of the board and/or the

CEO position), company valuation goes up 20%. Such a background can explain how the vitality and interconnectedness of a financial ecosystem of BAs and startups may improve access to both financial and non-financial resources and generate spin-off effects according to Isenberg (2011). The present findings may also challenge pecking-order theory (Myers and Majluf 1984) with respect to how an open strategic approach to external resources leads to improved future financial access and thus opportunities for firm growth. There are occasions when entrepreneurs oppose sharing control with outsiders (Frimanslund 2020) but, as we find here, firms that do so in an earlier phase find it easier to finance their growth. Our interpretation is that the early-phase involvement of eligible investors (e.g. key ecosystem actors) ameliorates the issue of asymmetric information for follow-up rounds and other matching sources of finance.

We did not find support for H4, i.e. the hypothesis that ecosystem collaboration increases perceived access to external finance. This was somewhat surprising, but we should be careful to reject the idea for three reasons. First, the sampling strategy in this study did not include non-ecosystem entrepreneurs. According to the process theory of Spigel and Harrison (2018), access to ecosystem finance and other resources increases as the ecosystem strengthens. This observation implies that a weak ecosystem will provide inadequate access to finance beyond governmental support, whereas a strong and vital ecosystem will be better equipped to offer internal means of such resources. Whether our respondents' ecosystems are weak or vital has not been assessed and thus remains a question for further research. Second, we found weak support for H2 (ecosystem collaboration increases access non-financial values) and support for H3 (access to non-financial resources is linked to perceived access to finance). We interpret these findings as indicating ecosystem collaboration can enhance access to finance, assuming that the startup is open to accepting and involving investors at an earlier stage. Third, previous research has found that startups' ability to utilize networks is insufficient in the earliest phase, increases as the startup becomes more established, and ultimately declines as the network size grows, leading to an inverse U-shape (Witt 2004). The literature posits that business ecosystems concentrate and simplify network access, but weak ecosystems and nascent/early-phase startups arguably do not make full use of them. Despite the lack of support for H4, we still argue that ecosystem collaboration may affect perceived financial access, assuming that the issues of mediation for non-financial resources, sample strategy, and startup phase are accounted and controlled for.

We obtain moderately strong support for H5, i.e. the hypothesis that perceived access to finance is associated with the perceived performance of the firm concerning growth, profits and efforts. This is not in any way a controversial claim. However, from an ecosystem perspective, it follows the proposed logic of Isenberg (2011) that reduced perceived access to finance from successful entrepreneurs reduces access to inspiration, role models, and qualified governance to achieve economic goals as often elaborated in the firms' prospects and financial plans. Therefore, the support for H5 presents an argument for increasing focus on the financial dynamics of business ecosystems.

Furthermore, we examined the exogenous and regional conditions of access to finance.

First and foremost, we considered how a set of regional investor characteristics concerning knowledge and acceptance of non-related technologies and innovations influenced perceived access to finance and economic consequences. Here, we find support for H6 and 7, which together indicate that regional industrial homogeneity serves as a barrier to capital acquisition. This observation suggests that startups may find it challenging to finance ventures in industrially dense and homogenous areas if the venture is in an unrelated sector. Furthermore, this finding could help explain why innovative business ecosystems tend to emerge in urban areas more than mono-industrial regions: the emergence of modern and innovative business ecosystems is affected not only by the number of investors or entrepreneurial role models but also by the plurality and variety of accessible resources. As the ecosystem literature progresses, we suggest that the role of this issue as an element in the entrepreneurial ecosystem framework receive attention. In an investment process, the degree of information asymmetry is strongly related to the area of expertise of the investor, and a dominant industry in a region implies that the degree of asymmetry remains higher for independent ventures.

Regarding the exclusion of the regional startup culture construct and its associated influence from the model, we still do not entirely reject the idea. However, we suspect that a lack of established measures of rural corporate culture and the proposed conflict between stakeholder (value) and shareholder (growth) orientation for this purpose means that we have to refine our questions. Consequentially, the discarded hypothesis H9 should be viewed in context with H1, which addresses exit attitudes, and we recommend fine-tuning the measures and sampling strategy to better examine the proposed issues. An issue left for speculation is whether the absence of a rural startup culture does not appear obstructive to resource acquisition, or whether functional ecosystems counterweigh such disadvantages. A rural startup often happens within the value perspective, whereas the firm's growth needs to happen within the growth perspective. At one point, this leads to a conflict of interests.

Concerning the theoretical bases identified in our literature review, we argue that our findings are in line with the principles of both agglomeration and agency. The diversity of an (agglomerated) regional business sector provides higher informational asymmetries toward startups. Adopting an open strategy toward mastering the necessary entrepreneurial resources (such as the knowledge and finance necessary to grow) is a way to overcome these predominantly rural dispositions.

## 5. Conclusion

Based on a survey of early-phase entrepreneurs associated with various startup environments in Norway, we inquire about a set of conditional factors concerning regional industries, startup culture, ecosystem collaboration and non-financial investor resources and their influences on perceived access to startup finance. The data were analyzed using SEM.

There are two main findings from this research. First, we find that firms that share control and influence through governance or other value-adding engagements experience improved perceived access to finance. We would expect ecosystem affiliation to

enhance this relation, but as our initial sampling strategy included only ecosystem members, we could not benchmark our results. Second, we find indications that unrelated ventures in homogenous industrial regions find it harder to attract finance and that this difficulty affects the perceived performance of the firm.

The study has five limitations. A concern in SEM is the adequacy of sample size. There appears to be a prevalent idea that one needs a large sample size (n> =250) to be able to conduct SEM analyses. This may be an overgeneralization. The sample size is relevant in the case of SEM since it is related to the stability of the estimates. However, the sample size is not the only factor to be considered. Kim et al. (2007) recommended a two-stage unified SEM and general linear modeling approach in their neurological study of multivariate MRI data with 28 subjects after comparing the results with several other approaches. Sideridis et al. (2014) stated that there will be instances where the sample size is small due to the cost of obtaining associated data and specialized samples, in their case, neuroimaging data. They identified proper modeling and power to be the issue, not the actual sample size going by a rule of thumb. Bollen (1996) stated that a sample size of 50 is adequate to obtain proper parametric specifications in the case of latent variable equations. Thus, the concern is not one of sample size per se but one of the characteristics of the units in the sample. N = 131 out of 542 total such ventures represents 24% of the identified sample population. There is no joint database or listing of startups associated with business ecosystems (startup hubs, science parks and incubators, etc.). In particular, we estimate that the 542 identified respondents represented the vast majority of potentially relevant firms for this survey. We believe the share of participants adequately captured the range of firms and did not compromise the power of the subsequent analysis. Another limitation of this study is our inability to say anything definitive about the effect of business ecosystem affiliation on financial access. The sampling strategy did not include independent ventures or homogenous industrial clusters and intrapreneurs who do not appear in public records. Furthermore, we are unable to generalize our findings beyond the Norwegian context. Even within Norway, the population of rural growth-oriented startups is limited, and the factors that vary between densely and sparsely populated areas and contexts are challenging to assess in such a study. Last, despite the limited population (and subsequent sample), we cannot exclude the possibility of mis-estimation of effects. This concern also applies to the constructed measures that lack sufficient anchoring in the literature. Most of these issues could be addressed by replication or cross-country studies in other contexts. The fifth limitation relates to the same dataset and has been used to scale development and testing. We did not believe a second and additional round of responses for the sake of scale development would be possible due to the already marginal population. However, a preceding case study gave sufficient confidence in the scales and the results have proven to be valid.

Despite its limitations, this study represents a rare empirical contribution to both the strategic management and regional development branches of the entrepreneurial ecosystem literature. The study emphasizes the importance of ecosystem feedback loops as proposed by Isenberg (2011) with respect to the need for a region to base entrepreneurial fostering and development on the facilitation and recycling of existing technical resources beyond mere governmental stimulus, which is finite by nature. In

cases where regions are industrially homogenous, measures should be taken to ensure network and financial access to relevant and eligible external actors outside the region for unrelated technologies and ventures. Therefore, policymakers and practitioners may build on these insights in their work to facilitate and acquire entrepreneurial finance, especially in rural areas. Similarly, rural entrepreneurs may use this knowledge to be better aware of the challenges of their regional dispositions.

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## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Appendix 1

*Note: The following contains the questions and items to each of the factors in the structural model as copied below. The questions were part of a larger survey that was distributed in Norwegian*. This is an English translation.

All items measured on a Likert scale ranging from 1 (disagree) to 5 (agree).

**Exit attitude (EA)**

| | |
|---|---|
| EA1 | Public support agencies in my region consider an exit as something negative |
| EA2 | The banks consider an exit as something negative |
| EA3 | My co-founder(s) consider(s) an exit as something negative |
| EA4 | Local investors consider an exit as something negative |
| EA5 | Remote investors consider an exit as something negative |

**Investor non-financial value (INFV)**

| | |
|---|---|
| INFVM | Governance (e.g. board member, mentor or similar) |
| INFVK | Knowledge |
| INFVN | Network |
| INFVL | Legitimacy for the firm |

**Entrepreneurial Ecosystem Network Collaboration (EENC)**

What constitutes ecosystem resources

| | |
|---|---|
| EENC1 | We cooperate with nearby firms |
| EENC2 | We cooperate with firms elsewhere in the country or abroad |
| EENC3 | Firms in our network supply valuable knowledge |
| EENC4 | Firms in our network supply valuable investments |
| EENC5 | I would like to re-invest capital and knowledge in nearby firms |
| EENC6 | To be part of an environment with other startups and founders is important for me |
| EENC7 | To be part of an environment with other startups and founders is important for my firm |
| EENC8 | I can influence the environment in which I am a part |

**Perceived firm Performance (PFP)**

| | |
|---|---|
| PISLG1 | I feel that the lack of access to capital hinders my firm's profitability |
| PISLG2 | I feel that the lack of access to capital hinders my firm's growth |
| PISLG3 | I spend unreasonable time and effort in acquiring capital |
| PISLG4 | Lack of access to capital reduces my ability to employ the people I need |
| PISLG5 | Lack of access to capital reduces my ability to achieve sufficient sales volumes |

**Regional investor heterogeneity (RIH)**
Lack of accessible investments hinders firm formation and growth in my region
Lack of accessible bank loans/credits hinders firm formation and growth in my region
Lack of accessible public grants hinders firm formation and growth in my region
There is sufficient access to investments in my region
There is sufficient access to loans/credits in my region
There is sufficient access to public grants in my region
**Perceived access to financial sources (PAFS)**

| | |
|---|---|
| PAEC | We have (had) sufficient access to external capital |
| PABL | We have (had) sufficient access to bank loans |
| PAPI | We have (had) sufficient access to private investors |
| PAVC | We have (had) sufficient access to venture capital funds or similar |
| PAPE | We have (had) sufficient access to private equity funds or similar |
| PAGR | We have (had) sufficient access to public grants, loans or investments |
| PACR | We have (had) sufficient access to crowdfunding or crowdlending |
| PAOF | Our own funds are sufficient |

**Regional Startup Culture (RSC)**

| | |
|---|---|
| RSC1 | There is a culture for creativity and innovation in my region |
| RSC2 | People prefer safe and stable employment in my region |
| RSC3 | People like to seek new opportunities in my region |