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The outcomes of cross-industry innovation for small and medium sized enterprises

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ABSTRACT

There is a lack of research on how cross-industry innovation (CII) affects growth processes in small and medium-sized enterprises (SMEs), and whether it is worthwhile for SMEs to attempt CII. The current study addresses this gap by examining how CII at different market entry stages leads to various modes of growth in SMEs. Based on a survey data from 1187 Norwegian SMEs, we demonstrate a clear positive connection between CII and growth, particularly organic and acquired growth, and CII and cost reductions. Our findings highlight the importance of innovation across industry lines and show that CII is a favorable option for SMEs. This study makes several contributions. First, it adds to the growth literature by stepping away from a unidimensional view of growth. Second, it extends the existing CII and SME literature by addressing CII outcomes for SMEs. Third, the findings have important implications for business practitioners and policy makers. In this regard, we recommend that SMEs explore and exploit CII opportunities whenever possible to achieve greater versatility and diversity. The clear connection between CII and SMEs' growth also emphasizes the need for policy-makers to further develop the policies facilitating proactive CII and connecting SMEs from different industries.

RÉSUMÉ

La recherche sur la façon dont l'innovation intersectorielle affecte les processus de croissance dans les petites et moyennes entreprises (PME) et l'intérêt pour les PME d'essayer l'innovation intersectorielle est limitée. La présente étude comble cette lacune en examinant comment l'innovation intersectorielle à différents stades d'entrée sur le marché conduit à divers modes de croissance dans les PME. Sur la base d'une enquête menée auprès de 1,187 PME norvégiennes, nous démontrons un lien positif évident entre l'innovation intersectorielle et la croissance, en particulier la croissance organique et acquise, et entre l'innovation intersectorielle et les réductions de coûts. Nos résultats soulignent l'importance de l'innovation dans tous les secteurs industriels et montrent que l'innovation intersectorielle est une option favorable pour les PME. Cette étude apporte plusieurs contributions. Premièrement, elle complète la littérature sur la croissance en

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s'éloignant d'une vision unidimensionnelle de celle-ci. Deuxièmement, elle élargit la littérature existante sur l'innovation intersectorielle et les PME en abordant les conséquences de la première pour les dernières. Troisièmement, ces résultats ont des implications importantes pour les praticiens et les décideurs du monde des affaires. À cet égard, nous recommandons aux PME d'explorer et d'exploiter les opportunités de l'innovation intersectorielle à chaque fois que cela est possible afin d'obtenir une plus grande polyvalence et diversité. Le lien évident entre l'innovation intersectorielle et la croissance des PME met également en avant la nécessité pour les décideurs politiques de développer davantage les politiques facilitant les innovations intersectorielles proactives et reliant les PME de différents secteurs.

1. Introduction

Small and medium-sized enterprises (SMEs) constitute 99.8% and 99.4% of all firms in Europe (Knop 2007) and Norway (SSB. 2020), respectively, and are important drivers for innovation and regional development (Isoherranen and Ratnayake 2018). In the last two decades, SMEs have been affected by large-scale changes and disruptions due to economic downturns, digitalization, concerns regarding sustainability, and the recent pandemic. To survive and sustain their growth in this challenging context, SMEs need to be innovative (Hausman 2005) across industry borders. Cross-industry innovation (CII) combines complementary resources and competencies from different fields, and thus provides a broader competence base and diversity in increasingly competitive markets (Enkel and Gassmann 2010). Successful SMEs are quick and flexible in their responses to change (Tunzelmann and Acha 2005) and are therefore well positioned to innovate (Tho 2019) and grow (Corsi, Prencipe, and Capriotti 2019), and, by extension, engage in CII.

However, there is still a lack of research on how CII affect growth processes in SMEs, and whether it is worthwhile for SMEs to attempt CII. The existing literature on CII mostly focuses on how firms may build an organizational foundation for CII (Hauge et al. 2017) and what the reasons for industry crossovers and diversification are (Steen and Weaver 2017; Mäkitie et al. 2019). The current study addresses this gap by exploring the outcomes of CII for SMEs. We especially focus on growth and cost reduction. Numerous studies (Pyka and Nelson 2018; Spescha and Woerter 2019; Kim 2022) have demonstrated a link between growth and innovation at a general level, and we therefore can assume a positive relationship between CII, a specific type of innovation, and growth. However, to extend our understanding of how firms grow, we need to account for different growth modes (McKelvie and Wiklund 2010; Davidsson, Delmar, and Wiklund 2006). The modes of growth include internal organic growth by increasing the number of employees, external acquired growth by conducting mergers and acquisitions (M&A), and growth by establishing a spin-off company. Engagement in CII (e.g., through an M&A or entering a new product market) may trigger firm growth (Brown and Mawson 2013).

The CII-related growth may be further affected by the CII development stage, that is, whether a firm attempts to move into a new industry or already has an established secondary market. We expect that the specific stages of CII development may be characterized by different growth modes, as SMEs may initiate organic growth, M&A or even spin-off creation based on how far along in the CII process they are. Thus, it is important to explore the relevance of each growth mode for SMEs at specific stages of CII development, and our findings showcase nuances in when SMEs grow based on their penetration level into a new market. We further argue that CII result in cost reduction. Therefore, we connect cost reduction to efficiency improvements and resource allocation and view this as a separate outcome (Jones and Linderman 2014; Teece, Peteraf, and Leih 2016; Havlíček, Thalassinou, and Berezkinova 2013).

Based on a survey of 1,187 Norwegian SMEs, we find a strong positive relationship between CII and growth in SMEs that have started generating revenues in a new market. However, it is necessary to mention that not all SMEs are oriented towards growth, nor constantly are at a stage where they seek growth (Smallbone, Leig, and North 1995). This makes our finding stronger as we did not select SMEs based on their growth ambitions, but rather found this relationship while including SMEs both focused towards growth and not. We also add to the theory debate by considering different modes of SME growth and the relevance of a CII strategy depending on the CII maturation level. In particular, SMEs with CII that has progressed past the planning stage, benefit in terms of organic and acquired growth, though we could not connect spin-off creation to CII. Moreover, we find that CII oriented SMEs also have an increased focus on cost reduction, which may serve to lower the risks of CII. We thus address the research gap concerning the outcome of CII for SMEs, and extend the literature on CII by considering its benefits.

Overall, this study makes several contributions. First, it adds to the growth literature by stepping away from a unidimensional view of growth. Accounting for different growth modes extends our understanding of the growth concept and demonstrates its nuances, especially in relation to the various CII development stages. Second, this study extends the existing CII and SME literature by addressing CII outcomes for SMEs, which is an under-researched topic. Moreover, looking at the different stages of CII offers a more advanced perspective, and we contribute to the field by inviting researchers to use our findings to examine the nuances of CII, for example by looking on which SME capabilities are best associated to the different growth modes and CII stages. In addition, addressing the Norwegian context provides new knowledge on how SMEs' CII activities develop in an advanced economy during a major external shock and downturn (e.g., oil crisis). Finally, the findings carry important practical implications for SMEs' strategic orientation. This study provides business practitioners with further incentive to engage in CII, as taking both risk assessments and growth gains into account favors attempting CII. By looking at different stages of CII and modes of growth, we also provide support for policy makers seeking to introduce CII fostering policy; moreover, we suggest when and how this strategy may be more favorable.

The remaining paper is organized as follows. [Section 2](#) discusses the theoretical framework and hypotheses of the study, while [Section 3](#) presents the research design.

This is followed by the discussion in [Section 4](#). [Section 5](#) concludes the paper with the limitations, implications, and avenues for future research.

2. Theoretical background and hypotheses

This section presents the literature on CII and different growth modes and discusses how CII may lead to SME growth.

2.1. Cross-industry innovation

CII seeks to combine knowledge from different industries, enabling firms to move into new industries. These firms require multifaceted organizational capabilities (Hauge et al. 2017; Helfat 2018) — for example, consistent focus on CII across the whole organization, divergent ‘cross-borders’ thinking, and effective resource management, resulting in successful CII and facilitating new path development. The literature on CII relates to several established research topics. First, it relates to absorptive capacity or the ability to adopt and collaborate in innovative pursuits across firm and industry boundaries (Cohen and Levinthal 1990; Enkel and Heil 2014; Lyng and Brun 2018). Second, it is connected to the diversification literature which focuses on the ability to spot opportunity windows and expand operations into new sectors through diversification strategies (Steen and Weaver 2017). And lastly, CII connects to the underlying dynamic capabilities needed to handle and move past the uncertainty associated with innovation (Teece, Peteraf, and Leih 2016), and CII in particular. Use of exploration and exploitation tactics enables SMEs to be less restrained by their size (Gassmann and Keupp 2007; Van de Vrande et al. 2009).

Regardless of SMEs’ innovation strategy and their organizational capabilities and advantages, the success of CII influences their output, and specifically their growth. In the long run, CII may bring new inputs and prevent locking the SMEs into a specific trajectory (Sydow, Schreyögg, and Koch 2009) responsible for potential growth stagnation. Since lock-in situations carry certain risks (Martin and Sunley 2006), the literature discusses multiple possibilities for extending, broadening, or recreating a firm’s path (Isaksen, Abelsen, and Jakobsen 2013; Grillitsch, Asheim, and Trippel 2018). For instance, the firm may choose to expand into a different industry through CII, and successful CII will help them achieve this. CII is, however, a long-term process and does not indicate when it will result in firm growth and path development. Firms adjust for past events and anticipate future market changes (Geroski, Machin, and Waltesr 2003), leading to varying growth rates over time. Moreover, potential pitfalls and reallocation of resources before success in a new market may inhibit growth. For a clearer indication of how CII contributes to firm growth, it is important to consider the different stages of CII development, spanning from a CII positioning prior to sales in the new segment, SMEs just starting to generate revenue from CII, to SMEs having gained a foothold in a new industry.

2.2. Growth modes: a wide span of growth

Audretsch, Coad, and Segarra (2014) report a lack of consensus regarding growth drivers, which include everything from industry affiliation, firm size, and age to level of competence, skills, and performance. However, there is consensus on innovation being a major driver of firm growth (Audretsch, Coad, and Segarra 2014; Bianchini, Pellegrino, and Tamagni 2018). Moreover, McKelvie, Brattström, and Wennberg (2017) offer new market entry as a mediator for growth. As such, we expect that CII, a specific type of innovation, will also lead to firm growth.

Firms primarily innovate and grow by focusing on core operations, competence, and existing resources (Cyriac, Koller, and Thomsen 2012). They are also more likely to focus on process innovation and scaling up operations in existing markets, instead of attempting entry into a new market (Coad and Guenther 2014). Nevertheless, in the open innovation paradigm, firms continually produce knowledge spillovers, use external knowledge, and sell their own internal knowledge (Chesbrough 2006), which positions them to attempt CII. The need for CII has been further recognized after the 2008 global financial crisis, 2014 oil price crash, push for green restructuring, and coronavirus disease (COVID-19). Wiklund, Patzelt, and Shepherd (2009) argue that a changing socio-technical landscape presents more opportunities for growth compared with a stable environment.

To remain competitive, SMEs need to juggle exploration and exploitation strategies, with potentially incompatible logic. Firms need to exploit and sustain existing operations, technologies, and markets, while positioning themselves for long-term success, exploring innovation opportunities and possibilities (March 1991, Koryak et al. 2018). For example, to begin with, a new CII market will depend on the SMEs' existing markets. Firms may use an adaptive, dynamic, and flexible approach to manage exploration and exploitation strategies simultaneously or alternate between them regularly (O'Reilly and Tushman 2016). Literature explains firms' choices of either exploitation or exploration strategy by different organizational factors, for example firm structure, absorptive capacity, slack resources, or firm size (Lavie, Stettner, and Tushman 2010). As such, a higher degree of formalization in the SMEs' organizational structure may lead to exploitation, whereas organizational slack, in form of human resources, may lead to exploration (Bérard and Fréchet 2020). The authors stress that the two do not impede each other but are rather complementary forces to be balanced. Different growth modes may partially represent these strategies, since we assume that CII is a form of exploration, possibly realized through creative application of slack resources. Thus, engaging in CII may, even early on, make firms less rooted in one strategy (Sydow, Schreyögg, and Koch 2009), regardless of their growth mode. Therefore, we propose the following hypothesis:

H0: Orientation towards CII leads to SME growth for all CII stages.

Existing studies (Pugsley, Sedlacek, and Sterk 2019; Grillitsch, Schubert, and Srholec 2019) have considered growth as a unidimensional concept, combining all modes of growth under one umbrella, or have only focused on one specific mode of growth. Thus, they have disregarded the differences in how firms grow, which hinders their potential to evaluate SME growth patterns effectively.

Recent studies (Peng et al. 2018; Mathisen and Rasmussen 2019) discuss one to three modes of growth, while Achtenhagen, Brunninge, and Melin (2017) consider as many as eight modes, proposing a more nuanced spectrum of growth, as opposed to the dichotomy between organic and acquired growth. However, most studies focus on how to develop a high-growth firm (El Hakioui and Louitri 2020) based on firm characteristics, entrepreneurial orientation, and absorptive adaptability (Eshima and Anderson 2017), rather than the actual mode of growth. It should also be mentioned here that not all SMEs are interested in or plan to grow their operations, due to a variety of reasons (Wang, Walker, and Redmond 2007). Greiner (1998) for example considers the history of firms to explain their growth, seeing evolution and growth as cyclic structures, wherein an SMEs organizational development will determine their position towards growth. Thus, firms will periodically undergo stages of upheaval and revolution, which may be followed by stages of evolution and growth, culminating in the firms realizing that they need to seek outward for solutions and opportunities, such as CII, to achieve further growth.

It may be noted that, while the literature does not always ignore different growth modes, it often fails to consider them as separate parallel entities in data analysis. Thus, by including several growth modes we highlight the complexity of how firms grow and explore whether firms' CII activities affect growth modes differently. These modes, for example, organic and acquired growth, may even facilitate each other (Juric 2020), as a period of one growth mode may lead to the next. It is especially relevant to consider different growth modes in the case of SMEs, as the literature suggests that firm size may also play a role in how firms grow, whether organically or through acquisitions (McKelvie and Wiklund 2010).

Instead of a unidimensional view of growth, we argue that specific modes of growth are positively boosted by CII in SMEs. These modes may also shape the evolutionary trajectory of firms. For example, organic growth may enhance path dependence, acquired growth may lead to a path extension (Karim and Mitchell 2000), and spin-offs may represent path renewal.

In the following subsections, we define the growth modes, and discuss how CIIs may strengthen each mode and help SMEs evolve.

2.2.1. Organic growth

Among the most common modes of growth (Davidsson, Achtenhagen, and Naldi 2010), organic growth is defined as 'the internal generation of resources' (Lockett et al. 2011, p. 52), such as an increase in the number of employees. It is also the preferred growth mode for SMEs (Davidsson and Delmar 1998).

Growth in number of employees may lead to internal knowledge and resource generation, and, therefore, enhance the existing strengths of a firm in its trajectory (Penrose 1960; Wernerfelt 1984). The synergy of combining current and new industries and using slack resources (i.e., using latent buffer capacity inherent to the firm through reorganization; Teece, Peteraf, and Leih 2016) may result in more efficient firms that grow organically (Orlando et al. 2018). However, to maintain an organic growth strategy, firms will have to expand their absorptive ability beyond their current operations (Mahnken and Moehrl 2018). While examining the relationship

between organic growth and diversification for large firms, Coad and Guenther (2014) found that new product introduction produced a negative effect on employment growth. However, SMEs may be more flexible, and, therefore, more receptive to change, which improves their ability to absorb new knowledge (Petruzzelli, Ardito, and Savino 2018). The literature (Freel and Robson 2004; Coad and Hözl 2012) finds a positive relationship between organic growth and product innovation in SMEs. These findings suggest that engaging in CII, while incorporating elements of either product or process innovation, produces a positive effect on the organic growth of smaller firms. While it may be easy to assume that scarcity of resources may impact SMEs orientation towards innovation, Colclough et al. (2019) report no such correlation. Thus, barring resource restrictions, the authors find that SMEs which are best at both exploitation and exploration perform better in terms of innovation. SMEs' innovative efforts then rest on the utilization of available resources; and identifying possible risks, specifically operational and strategic risks, can have a positive impact on future business (Dvorsky et al. 2021). Identifying potential risks, and implicitly opportunities, may spur SMEs' orientation towards CII, and have a positive effect on their growth from an early stage. Employment growth tend to precede new industry entry as firms need additional resources and competences to plan and execute integration into a new market (Coad and Guenther 2014). Thus, we can expect organic growth from the earliest CII stage as SMEs acquire external competence within the new field to develop and realize the CII. Thus, we hypothesize as follows.

H1: Orientation towards CII leads to SME organic growth for all CII stages.

2.2.2. Acquired growth

Acquired growth refers to growth through M&A, enabling firms to sidestep the internal development of resources by acquiring them instead (Barney 1986), and merging them with the firm's existing product or process range (Lockett et al. 2011). To innovate across industry borders, the pursuit of CII may lead to alliances and mergers which may provide the necessary complementary resources (McKelvie and Wiklund 2010; Filiou and Massini 2018) to realize CII.

The literature on M&A has generally focused on large and mid-size firms (McKelvie, Wiklund, and Davidsson, Delmar, and Wiklund 2006; Tunyi 2019), and largely overlooked the potential for acquired growth in SMEs (Bauer and Matzler 2014; Juric 2020). Moreover, an M&A may be more advantageous for SMEs than for large firms, as smaller firms require less integration and management than their larger counterparts (Bauer and Matzler 2014), resulting in more rapid M&A growth. In terms of CII, this organizational aspect may result in a more rapid beneficial outcome of the M&A.

By building their technological competence through acquired growth, SMEs are likely to enter M&As for innovation. Cefis and Marsili (2015) found that, for SMEs, M&As enable crossing the 'innovation threshold' and make firms more innovative. Although an M&A may be initiated based on complementary technology as a requirement for CII, it is likely to affect the SMEs' innovation processes (Di Guardo and Valentini 2007) and potentially alter the firms' resources, incentives, and structure, while carrying an element of process innovation (Arranz et al. 2019). This makes it

important to safeguard the technological foundation of the merger (Puranam, Singh, and Chaudhuri 2009). Bauer et al. (2018) demonstrate that M&As in SMEs benefit from allocating resources to both an exploitation and exploration strategy, rather than pursuing only one of them, and the fit with pre-M&A orientation affects the success of the M&A. Explorative innovation, such as CII, may lead to more diverse firms, capable to juggle several markets as a result of an M&A (Zhang, Chaoying, and Qi 2020).

Like organic growth, the knowledge diversity and innovation output of an M&A may contribute to and benefit from synergy effects and the realization of slack resources (Orlando et al. 2018; Ferrigno, Dagnino, and Paola 2021). Access to complementary knowledge and value from compatible SMEs (Harrison et al. 2001) set a favorable foundation for an M&A, both technologically and strategically (Bauer et al. 2018). Furthermore, CII is expected to be at the heart of an M&A, as SMEs may enter an M&A with the purpose of acquiring the necessary competence or resources for CII.

We do not expect the SMEs at the earliest stage of CII to achieve acquired growth, as they in this phase may overstretch their slack resources (Merino et al. 2014) to develop capabilities beyond existing operations (Helfat and Peteraf 2003). They also may achieve aspirations and resolve initial issues through exploitative measures. The potential gain from an early-stage CII that has yet to be validated in the market (Calipha, Brock, and The Academic College of Tel Aviv-Yaffo 2019), may also pose as a hindrance for SMEs seeking M&A partners. At later CII stages, SMEs entering an M&A may have moved past these hiccups, thus working towards further growth and exploration (Osiyevskyy et al. 2017). Thus, for acquired growth, we consider the later stages of CII where the SMEs have already achieved sales or gained a foothold in the new market, which is reflected in their resource distribution and subsequent acquired growth. This leads us to the following hypothesis.

H2: Orientation towards CII leads to SME acquired growth for progressing and mature CII stages.

2.2.3. Growth through spin-offs

The aim of creating spin-offs is to mitigate the risk for the parent company as well as allow it to share potential gains (Wallin and Dahlstrand 2006). In terms of economic restructuring, the creation of a spin-off may serve as a driver for innovation and industry flexibility, since spin-offs may capitalize on the capabilities of the parent company (Maldaner and Fiorin 2018), while being free of the parent firm's inertia (Buenstorf 2009). The decision to restructure a firm through the establishment of a spin-off company can potentially increase the firm's transparency and improve its organizational structure (Bergh, Johnson, and Dewitt 2008).

Events such as the discovery of an opportunity, or adverse events affecting the parent firm, may also trigger the creation of a spin-off (Buenstorf 2009). The foundation of the spin-off comprises knowledge about technology, markets, and/or customers. Previous research (Meland and Iakovleva 2016) has linked the parent company's innovativeness and pro-activeness with the establishment of innovation-related spin-offs, such as those driven by CII. Meland and Iakovleva (2016) argue that by creating

a daughter company, firms reduce risks and use of own resources, while utilizing their existing knowledge base or market connections. As for innovation types, while product innovations are often linked to the creation of spin-offs, process innovation is often more inherent to a firm, and thus less transferable (Wong, Lee, and Der Foo 2008), though given the dynamic between a parent and a daughter company, we view this as a bit narrow, as transferring employees may bring tacit knowledge with them.

Regarding the size, larger firms are more prone to form spin-offs to develop new technology, while focusing on their core business (Wallin and Dahlstrand 2006). This implies that SMEs may not be the primary target group for spin-off creation. However, emerging literature on acquired growth and SMEs (Juric 2020) testify that even smaller firms may explore growth modes previously dominated by larger firms. Exploring a new market through a spin-off has good prospects of success (Maldaner and Fiorin 2018), and as such, whether CII may be connected to spin-off creation in SMEs remains an open field with potential implications for both researchers and practitioners alike.

The CII stage for a spin-off may depend on the cause of spin-off creation, e.g. opportunities recognized by employees, necessity due to adverse developments, or through strategic decisions to separate a new segment. The spin-offs origins may affect both purpose and growth potential of the spin-off (Bruneel, Van de Velde, and Clarysse 2013). Opportunity and necessity spin-offs are more often linked to explorative efforts, such as CII, whereas the last type is often used to enter a new market, which may also represent a type of CII. The latter also implies the presence of a more developed or mature CII prior to spin-off creation. Therefore, we expect that larger SMEs with mature and successful CII create spin-offs, as they have the resources to bring CIIs to the market. Alternatively, employees may seek opportunity or necessity spin-offs (Fryges and Wright 2014), which depending on need or external events, may occur at earlier CII stages as well. We hypothesize the following:

H3: Orientation towards CII leads to SME growth through spin-off creation for all CII stages.

2.3. Cost reductions through efficiency improvements

Once an SME moves into a different industry, it must handle the challenges of managing several markets simultaneously, which may cause changes to the internal firm structure and operations (Smith and Cooper 1988). SMEs often experience resource constraints (Wolff and Pett 2006; Wiklund, Patzelt, and Shepherd 2009), and two of their main innovation obstacles are limited economic resources and potentially high costs of innovation (Albach et al. 1996). To account for this, management may revise costs to reduce the risk of entering a new market, improve efficiency, or release capital to support a new market segment (Teece, Peteraf, and Leih 2016; Havlíček, Thalassinou, and Berezkinova 2013). The mere act of cutting costs may be the result of achieving a leaner firm structure and supporting innovation activity, and active cost cutting becomes a tool for managing and mitigating the potential risk of CII activities. Risk-taking entrepreneurs appear more successful than their risk-averse counterparts (Cho and Orazem 2021) and crossing industry lines to innovate entails

risk. This indicates that SMEs involved in CII may accept risks and consequently mitigate them by cutting costs, and we expect this holds true for SMEs engaged in CII, regardless of how far along in the CII process they are.

Today, the industrial landscape is competitive, and SMEs require both innovation and efficiency to survive. An external competitive environment may make firms focus on process innovations, along with incremental product and efficiency improvements (Jones and Linderman 2014). Further, process improvements may strengthen firms' innovation performance (Kim, Kumar, and Kumar 2012), increase efficiency (Jones and Linderman 2014), and by extension, foster their ability to engage in CII. Research indicate that process innovation may reduce costs (Czarnitzki and Kraft 2004), and we'd like to extend the argument to include CII as well. Chen and Liu (2018) make a similar argument concerning green innovation and find it to be moderated by a firm's focus on costs and differentiation strategy, both of which are likely to be present in a volatile and competitive market, and we expect the same to apply to CIIs.

Firms may experience internal power struggles as they operate in several markets due to CII activities (D'Souza and Lai 2003), and this may increase their focus on costs. As old and new operations compete for the same resources, we expect SMEs to focus on costs even at the earliest stage of CII development. SMEs with progressive CII, that have just reached the market, do perhaps have the strongest focus on costs, as this period may be crucial to the CIIs future survival. We expect the power balance and cost reduction to be more stabilized for mature CIIs. However, even SMEs at a more mature stage of CII development are likely to continue efficiency improvement as their new market segment grows and can eventually draw on economies of scale.

Thus, we hypothesize that CII leads to cost reduction due to efficiency improvements as follows:

H4: Orientation towards CII leads to SME cost reduction for all CII stages.

2.4. Additional factors affecting SME growth

We have included some common factors (in addition to CII) leading to firm growth (Zhou and De Wit 2009; Wiklund, Patzelt, and Shepherd 2009; Kangasharju 2000) as control variables in our analyses. The variables firm size, process, and product innovation have already been discussed in the previous sections; thus, here we briefly discuss the variables of firm age, market stability, ownership form, as well as industry and regional affiliations. In terms of age, younger firms are better positioned for growth (Coad and Hözl 2012; Davidsson and Delmar 1998), and specifically, organic growth (Coad, Segarra, and Teruel 2016). How SME grow may further grow depend on the market volatility they experience, making many of them, despite resource constraints, to prefer market-driven strategies to remain competitive and innovative (Corsi and Prencipe 2018).

Independent firms may exhibit more flexibility and autonomous control than larger corporations (Barney 1991), which in turn may indicate a stronger openness for exploration, and CIIs, whereas multidivisional firms are better equipped to exploit opportunities (Delmar, Davidsson, and Gartner 2003).

Table 1. Characteristics of SMEs.

	SMEs total	Non-CII SMEs	SMEs engaged in CII
Number of	1187	645	542 firms (45.7 %)
Mean size	26.6	28.1 employees	24.8 employees
Median size	17	18	15 employees
Mean age	19.7	21.02	18 years
Median age	18	19	17 years
Amount with less than 50 employees	88 %	86 %	91 %
Subsidiary (daughter) company	224 SMEs, 19 %	115 SMEs, 18 %	109 SMEs, 20 %
Parent company	98 SMEs, 8 %	57 SMEs, 9 %	41 SMEs, 8 %
Independent company	865 SMEs, 72.87 %	476 SMEs, 73.8 %	392 SMEs, 72.3 %
Changed main industry	–	–	11 % (n = 460)
Organic growth	53.85 %	47 %	62 %
M&A	15.8 %	12 %	20.4 %
Est. spin-off	14.1 %	13.2 %	15.4 %
Cost reduction	67.74 %	63.8 %	73 %

As for industry affiliation, each industry possesses unique characteristics, reflected in the firms' organizational and institutional structure (Carroll and Hannan 2000), which may affect their growth (Wiklund, Patzelt, and Shepherd 2009). Regional characteristics may also affect firms' growth, as Hauge et al. (2017) indicate a connection between firms' CII capabilities and their localization in either thick and specialized or thick and diversified regions.

3. Research design and methodology

3.1. Empirical context

To test our hypotheses, we conducted a cross-sectional telephone survey with the chief executive officers (CEOs) of Norwegian SMEs in the first half of 2018. The European Commission (u.d.) defines SMEs as firms with fewer than 250 employees. In our survey, we addressed firms with a minimum of five employees. The total sample was 1,187 SMEs, of which 378 SMEs had 5–10 employees, 672 SMEs had 11–50 employees, and 137 SMEs had 51–250 employees. The SMEs in the sample represented 81 out of 89 economic regions in Norway and a wide variety of industries. The overall response rate was 34.8% among firms with whom contact was established. A professional market research firm performed telephone survey and coded the raw data. The survey was conducted in Norwegian and lasted 12 minutes on average, with close-ended questions. As the survey was a part of a larger research project, it also covered additional topics not included in this paper. The data was treated confidentially, and the respondents did not provide their names.

Table 1 provides an overview of the characteristics of the SMEs sample. In our sample, 45.7% of the SMEs engaged in CII during the period 2015–2018, and 11% of those engaged in CII completely changed their main industry during the past three years (n = 460). During the past three years, 20% SMEs engaged in CII had performed M&As, 62% had experienced growth in employees, 15% had established spin-off companies, and 73% had performed cost reductions.

3.2. *Dependent variables*

In section 2 we looked at the connection between CII and growth and considered various reasons for why CII leads to growth as an outcome. As mentioned in the literature, innovation has previously been shown to affect growth, and as such it is logical to assume that CII, a particular type of innovation, may harbor a similar relationship with growth. Based on this discussion, we chose the different growth modes as our dependent variables, to study how CII affects growth. We measured both growth in general and each mode of growth, and also cost reductions. We did this by asking if the firms had developed in any of the following ways during the past three years: (i) increased the number of employees, (ii) performed a merger or acquisition, (iii) established a spin-off, or (iv) performed cost reductions. Positive responses to these questions (i.e., ‘yes’) were coded as (1), while negative replies (‘no’) were (0). Respondents in the category ‘unsure/don’t know’ were not included in the analyses. While these questions told us how the firms grew, we created a new variable that included positive replies to either (i), (ii), or (iii), coded as (1), to study the concept of general growth.

3.3. *Independent variables*

There has been limited research on the concept of CII (Hauge et al. 2017). One of the few existing studies (Aarstad and Jakobsen 2020) suggests to measure firms’ engagement in CII by answering ‘yes’, ‘no’ or ‘don’t know’ to these questions:

- I. Mature stage CII: Has your firm increased sales in a secondary industry previously constituting less than 20% of the firm’s operations during the past three years?
- II. Progressing stage CII: Has your firm had sales in a completely new industry for the firm during the past three years?
- III. Early-stage CII: Has your firm entered a completely new industry for the firm, but still not achieved sales during the past three years?

This gave us three measures for CII, depending on the progression of SMEs in the CII process. Positive responses indicated that the SMEs engaged in CII, and were coded as (1), negative responses were coded as (0), and respondents in the category ‘unsure/don’t know’ were not included. We used these three CII stages to create one additional general measure for CII as follows:

- i. Overall CII: positive replies to (i), (ii), or (iii).

Table 2 displays the percentage of firms that responded positively toward CII at the different stages.

3.4. *Control variables*

Positive responses to questions about product innovation and process innovation were coded as (1), and otherwise as (0). Being part of a larger enterprise, as either a

Table 2. Percentage of firms that engage in CII at different stages.

Stage	Percentage of firms that engage in CII at different stages
Overall CII	45.6 %
Mature stage CII	29.4 %
Progressing stage CII	22.2 %
Early-stage CII	9.2 %

parent or daughter company, was coded similarly. The degree of market volatility, firm size, and age were also included as controls. Firm size and age were skewed, and we used the natural logarithm of these variables. We also controlled for industry affiliation and economic region. Industries were listed at the Nomenclature of Economic Activities (NACE-code; Statistics Norway [SSB] 2008) two-digit level, which refers to particular industry divisions. In total, the SMEs in the survey represented 53 industries¹. An economic region was defined based on the SSB. (2018) regional division between counties and municipalities, totaling 89 economic regions in Norway. This division corresponds to the regional level as defined in NUTS4² by the European Union (SSB. 2019).

3.5. Regression modelling

We performed multilevel logistic regressions using a logistic random intercept nested model (Hundt and Sternberg 2016; Klein, Dansereau, and Hall 1994; Boyd and Iversen 1979), with growth as a binary dependent variable using the software, Stata 15 (Stata 2017). With firms as the lower-level unit and industries and economic regions as the higher-level units, we nested our firm level variables first within an industry and then nested the industries within economic regions. Thus, our model is controlled for operating in specific industries, and for operating in specific industries in particular economic regions.

In the dataset, there was some overlap among respondents concerning growth modes and CII stages, as some SMEs responded positively for several modes or stages, having moved between different modes or stages from 2015 to 2018. To verify our results, we ran regressions on variables without any overlap. Apart from marginal variations in the coefficients, we found the same results (significant discrepancies are noted in Table 3). Based on this and the fact that some of the growth modes may naturally overlap and be dependent on each other (see Kaya and Persson [2019] for how organic and acquired growth may encourage the other growth mode), we chose to present regressions with some overlap.

3.6. Summary of regression estimates

Table 3 presents a summary of the regression estimates for CII variables. Each CII variable was measured separately against the growth modes in independent

¹We also ran the analyses against ten major industries in Norway, including oil and gas, which experienced a downturn during the survey period, and acquired similar results to when the NACE code industry classification was used.

²The nomenclature of territorial units for statistics.

Table 3. Summary table with significant finds listing coefficients and standard error.

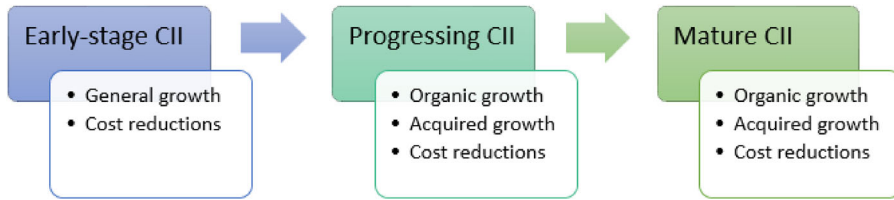
	General growth	Organic growth	Acquired growth (M&A)	Est. spin-off	Cost reduction
Overall CII	.775*** (.145)	.638*** (.143)	.564*** (.172)	.010 (.177)	.424** (.148)
Mature CII	.649*** (.160)	.640*** (.156)	.407* (.177) †	.028 (.189)	.370* (.165) †
Progressing CII	.666*** (.180)	.410* (.170)	.577** (.184)	.214 (.199)	.589** (.190)
Early stage CII	.553* (.282) †	.388 (.272)	.308 (.313) □	.302 (.309)	.676* (.299) †

Note:

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, logistic multilevel regressions.

†Not significant when accounting for overlap in both growth mode and CII stages.

□Significant when accounting for overlap in growth mode and CII stage.

**Figure 1:** The different stages of CII development.

regressions (for a total of 20 regressions; see [Appendix A](#)). We see that being engaged in CII has a significant positive effect on growth, particularly organic and acquired growth. This holds for firms that have achieved sales in their new industry (i.e., progressive and mature CII stages). However, for firms at the early stage of CII, the only significant relationship is between CII and general growth. While CII has no significant effect on the creation of spin-offs it maintains a positive relationship with cost reductions for the different CII stages.

[Figure 1](#) summarizes the effects of CII for SMEs at the different stages of CII development.

The detailed regression results for the control variables are included in [Appendix A](#)). We note that while *product innovation* has a positive effect on general growth, organic growth, and spin-off creation; *process innovation* has a positive effect on general growth, acquired growth, spin-off creation, and cost reduction. Furthermore, *market demand* has a negative effect on general and organic growth, and a positive effect on cost reduction, while *firm size* has a positive effect on all modes of growth and cost reduction; *firm age* has a negative effect on general and organic growth, but a positive effect on cost reduction. There is a significant negative relationship between SME being a part of a larger corporation and general growth, organic growth, and spin-off creation, whereas it has a significant positive effect on cost reduction. The multilevel variables, *industry affiliation*, and *economic region* have no significant relationship with either growth mode or cost reduction.

4. Discussion

4.1. H0: Orientation towards CII leads to SME growth for all CII stages

The aim of this paper is to show that SMEs oriented towards CII benefit from their endeavors in terms of growth, regardless of how far along their CII have progressed. Our findings show a clear connection between CII and growth, validating our

hypothesis that CII leads to SME growth at the general level. During the survey, we asked the firms about the 2015–2017 period, a time of a severe downturn in the global oil and gas market. As an oil nation, Norway and in particular its counties in Western Norway (where two-thirds of the surveyed firms are from) were greatly affected by the oil crisis. However, large scale environmental changes also provide opportunities for SME growth (Wiklund, Patzelt, and Shepherd 2009), by encouraging entrepreneurial orientation and innovative outputs. While not primarily studying an external shock, given the context of our study, the findings support this branch of the literature, thus, positioning CII as a favorable strategy option for SMEs. However, our findings indicate that growth on a general level, is still perceived as more likely in a less volatile market environment (market volatility estimation is based on our control variable “demand for firms’ products are shifting”, see [Appendix A](#) for regression results). We speculate that this may affect SMEs resource spending, as SMEs with shifting demands in the market keep slack resources and flexibility to counter market volatility, whereas a more stable market may more easily free a predictable amount of slack.

As the positive relationship holds even for the SMEs still at the planning stage of CII, it may lower the perceived risk and cost of steering SMEs towards CII for business practitioners. Costs at the earliest CII stage are likely diffused through the utilization of slack resources available in the SME. The strategic implications may also indicate that SMEs doing CII, have a good overview of potential threats and risks, thus positioning them to mitigate risks and steer clear of larger pitfalls. Policy makers and researchers may use this argument and positive relationship between CII and growth, to further look for ways for businesses to cross industry lines.

Due to their flat and flexible organizational structure (Tunzelmann and Acha 2005), SMEs are well-positioned to make quick changes, and new market conditions may have had a direct effect on CII initiatives (see Van de Vrande et al. 2009), though as we see in our results, more stable market conditions are more favorable for SME growth. In line with Tho (2019) finding that proactiveness and responsiveness to market conditions positively affect innovation, a proactive approach to CII, rather than a reactive one, might have led to even more firms reporting growth. Researchers may be interested in exploring the nuances of reactive versus proactive CII and its implications for SME growth. However, we observe firm growth even against a backdrop that primarily facilitates reactive survival mechanisms. The innovation and growth of SMEs in this landscape indicate their ability to maneuver dynamic situations based on pre-existing foundations of absorptive capacity (Lyng and Brun 2018) and cross-industry innovation capabilities (Hauge et al. 2017).

Our analysis demonstrates that larger SMEs from a stable primary market are better positioned to grow, with more resources and existing cash flow to support CII initiatives, which are somewhat dependent on SMEs’ existing operations (Shin and Stulz 1998). Even SMEs at the early stage of CII development had a significant connection with general growth, despite their lack of sales in their new market. Thus, CII should not be perceived as too risky or costly for business practitioners and policy makers alike to engage in and promote.

4.2. H1: Orientation towards CII leads to SME organic growth for all CII stages

The positive relationship between innovation and organic growth in SMEs is extensively backed by extant research (Pyka and Nelson 2018; Kim 2022), but we add to this stream of literature by emphasizing that CII specifically contributes to organic growth. This is a topic which has not previously been explored, and which we see as a valuable contribution for both researchers and business practitioners. The fact that crossing industry lines have positive implications for SME organic growth may impact SMEs' risk assessments and strategic choices in the direction of a higher entrepreneurial orientation (Baker, Grinstein, and Perin 2020). The positive connection between product innovation, specifically, and organic growth (see Freel and Robson 2004), has further led us to believe that for SMEs' organic growth, CII may be realized through product innovation. This gives an indication for where in the organization the CII occurs, as products constitute a central focus point for SMEs (Coad and Hözl 2012). We invite future studies to follow up on how CII connects to product innovation and how this may extend SMEs' absorptive capacity to other fields (Mahnken and Moehrle 2018) and provide grounds for path renewal.

SMEs' size and composition may vastly differ from their larger counterparts, in terms of hierarchical structure, flexibility and willingness to change (Petruzzelli, Ardito, and Savino 2018), which positions them to exploit surplus slack resources for exploring CII opportunities prior to growing organically. We hereby extend this literature by showing that CII and new industry entry is positively tied to smaller firms. We will add here that in our sample 88.5% of the firms had less than 50 employees. However, among our sample we demonstrate that larger SMEs have a higher chance of growing organically when engaging in CII than their smaller counterparts owing to a larger resource base, and better awareness to expand the firm's path trajectory (Wolff and Pett 2006; Wiklund, Patzelt, and Shepherd 2009).

Whereas we hypothesized a positive impact on organic growth for all CII stages, the earliest CII stage show no significant relationship with organic growth (the relationship between early-stage CII and organic growth remains positive however, possibly indicating a potential for future organic growth). Originally, in line with previous research conducted on larger firms (Coad and Guenther 2014), we expected that SMEs seeking CII would from an early stage hire additional competence to realize and bring the CII to market, and thus lead to early-stage organic growth. We may explain this contradicting finding by considering SMEs' resource availability and application. In general, SMEs tend to rely on and utilize existing resources in their operations (Tece, Peteraf, and Leih 2016), indicating an exploitative approach. At the earliest stage, the CII has yet to generate income for the SME, while already starting to drain resources. SMEs then run the risk of overstressing their resources and overlooking the need to replenish them (Merino et al. 2014), through for example organic growth. This stretching of resources forces the SMEs to balance both exploitation and exploration at the same time, through developing and maturing accompanying resources and capabilities beyond their initial application (Helfat and Peteraf 2003). However, we find as expected a positive relationship between the two more developed CII stages and organic growth. This development speaks to the fact that the SMEs at these stages have consumed the slack resources initially available within

the firm, and hence need to hire more employees to sustain and develop their operations. Though we have not looked at what kind of competences SMEs seek at this stage, we assume that SMEs look for CII competence to further develop their new segment. This lines up with previous research exploring capabilities for CII (Hauge et al. 2017).

4.3. H2: Orientation towards CII leads to SME acquired growth for progressing and mature CII stages

In our sample, 20.4% of the CII-engaged SMEs grow through M&As compared with 12.1% of the SMEs not engaged in CII, indicating that the CII potential is a crucial element for an M&A (Mawson and Brown 2017; Cefis and Marsili 2015). As expected, when looking at the different CII stages, CII does not lead to acquired growth at the earliest stage, a stage which is more likely characterized by identifying the CII opportunities as well as planning and organizing for a potential M&A. However, when accounting for overlap in both CII stages and growth model (see Section 3.5), we found a positive significant relationship between early-stage CII and acquired growth, indicating that CII stands at the crux of an M&A even prior to generating income. The analyses run with no overlap reduced the number of SMEs in this category to 330, and as such we place more weight on the non-significant finding for this CII stage and acquired growth.

Though an M&A involving SMEs often require less resources during the integration and management restructuring phase (Bauer and Matzler 2014), we find strongest support for acquired growth as soon as the SMEs start to achieve sales from their CII. This implies that SMEs enter an M&A at the progressive CII stage, as they then may need additional or complementary resources to grow the new segment (Mawson and Brown 2017; Grimpe and Hussinger 2008), positioning CII as a major reason for instigating an M&A. This resource exploitation then provides a way for the SMEs to bridge the gap of entering a new industry (Penrose 1959).

Going deeper, we estimate that SMEs at the progressive CII stage are amid reorganizing slack resources, integrate and come to terms with the benefits of the merger. This enables them to take the next step with their CII, while at the same time needing to safeguard the technological reasoning for the M&A. As expected, we also link acquired growth to process innovation, and speculate that CII leading to acquired growth, are more strongly based on a need for process innovations to realize and scale up the CII (Puranam, Singh, and Chaudhuri 2009), rather than as a mere technological benefit. Thus, whereas we originally hypothesized SMEs use the M&A for explorative purposes (Zhang, Chaoying, and Qi 2020), we now find it to be more nuanced, carrying both explorative and exploitative measures. This stands in contrast to Bauer et al. (2018) recommendation that SME base M&As on only one of these tactics, and instead highlight the need for SMEs to juggle both (Koryak et al. 2018). Policy makers and business practitioners may find this duality of the CII orientation interesting when seeking to foster SME's acquired growth.

While we find support for the mature CII segment and acquired growth as well, it is weaker. We explain it by a lower need or desire for an M&A, largely attributed to

the fact that they already have a well-established foothold in the new industry and are thus able to support the CII segment on their own.

Overall, we add to the theory debate by demonstrating a clear positive connection between CII-oriented SMEs and acquired growth, a growth mode which has in previous literature primarily been linked to larger firms. However, it should be noted that larger SMEs are more prone to grow this way, backing Tunyi's (2019) findings that mid-size firms are more inclined to form M&As. Smaller SMEs may be affordable, but the potential gain of their acquisition may be harder to obtain, as they may have yet to achieve success or significant power to be a desirable M&A target. Many SMEs struggle to scale up operations (Song and Bérubé 2021), and perhaps reach a size that will make them more desirable for acquisition, an aspect which policy makers and researchers may investigate. It is also questionable whether the smallest firms have the capacity and slack resources available to develop and follow up an M&A while maintaining their core operations.

4.4. H3: Orientation towards CII leads to growth through spin-off creation for all CII stages

Although a slightly higher percentage of CII-engaged SMEs (15.6%) established spin-offs compared with their non-CII counterparts (13.2%), we do not find support for our hypothesis regarding CII and spin-off creation for SMEs, regardless of CII stage. This finding contradicts our assumptions, and we therefore draw the conclusion that spin-off creation is not a viable growth option for SME oriented towards CII. Though existing literature (Juric 2020) opens for SMEs engagement in different growth modes, spin-off creation is perhaps a mode more difficult to engage in for smaller firms. It seems that SMEs find it preferable to keep the CII in-house, implying that the CII is closely related to the SME's core activity, and as demonstrated in our findings, more likely to be realized through organic or acquired growth. This may be related to the SMEs often having a flatter and more flexible structure compared to larger corporations (Petruzzelli, Ardito, and Savino 2018; Tunzelmann and Acha 2005), simplifying the facilitation of internal CII projects. While larger firms often use spin-offs to target resource allocation (Meland and Iakovleva 2016), SMEs have different structures and needs which require both recognition from policy makers and more research if CII through spin-off creation is to become a growth option worth pursuing. However, we find that larger SMEs are more prone to grow through spin-offs, which is consistent with the literature (Wallin and Dahlstrand 2006). Considering the success prospects of CII oriented spin-off growth (Maldaner and Fiorin 2018), we view this avenue as worth further exploration. In which case it may be interesting to differentiate between different spin-off origins. The large-scale back-drop of the low oil price just prior to the survey, might have pushed some SMEs towards necessity spin-offs, though our non-finding cannot indicate its relevance.

4.5. H4: Orientation towards CII leads to SME cost reductions for all CII stages

In line with our expectations, we find a clear connection between CII and cost reductions, and are thus able to extend the literature on innovation types having cost

reductions as a side outcome (Czarnitzki and Kraft 2004; Chen and Liu 2018). As indicated in the literature review, we attribute this to SMEs' limitations in terms of resources and a need to balance the core segment and the new CII segment (D'Souza and Lai 2003). SMEs' focus on cost reduction while doing CII indicates an awareness among business practitioners on the potential risks and pitfalls associated with crossing industry lines. While we have already shown the positive relationship between CII and organic and acquired growth, this additional focus on cost reductions should be noted by policy makers interested in promoting CII. We see this as a way to lower the threshold of policy initiatives targeted towards CII in SMEs.

The connection between different CII stages and cost reduction did not surprise us, and we find it important to showcase when the focus on costs becomes important for SMEs, as it speaks to SMEs organizational structures and awareness of their environment. Even before SMEs achieve sales through CIIs in a new industry, and after the CII accounts for over 20% of their operations, they reduce costs. However, these results need to be treated with caution, as the analyses with no overlap for the early CII stage ($N_{SME} = 676$) and for the mature CII stage ($N_{SME} = 782$) did not yield a significant result. We explain it by these two stages either preceding or following a period of adjustments, such as necessary cost reductions to accommodate a new segment. For instance, the CII segment have yet to necessitate cost reductions, or the CII has passed the stage where such measures are most needed. This leaves the progressive CII stage – SMEs seeking to establish and grow in a new market or industry – as the period when SMEs are most concerned with cost reductions according to our findings.

This result may be explained by the fact that SMEs experience a significant strain on resources at this point, similar to start-up companies attempting to move past their first customer (Aspelund, Berg-Utby, and Skjevdal 2005). It is at this stage that SMEs needs to build organizational routines for sustaining the new segment and reduce costs to reduce the drain on resources in the form of process improvements and efficiency gains. Since this represents a crucial stage in the CII development, policy initiatives should seek to target SMEs' CII initiatives here.

Our findings extend the literature (Czarnitzki and Kraft 2004) by addressing a new type of innovation – CII – that reduces costs, along with process innovation. While we find a direct connection in our data between CII and cost reduction, we cannot exclude that there may be other underlying factors contributing to this finding. Further, as previous literature (Auh and Menguc, 2005; Chen and Liu 2018) has stated, the market dynamic is also important for a firm's focus, and we see the same connection in our results. A volatile market keeps SMEs on the edge and increases the focus on costs, and as CII introduces uncertainty and risk, this causes SMEs to keep a vigilant eye on cost structure to remain competitive.

As stated, many of the SMEs in our survey were affected by the downturn in the oil and gas sector in 2014-2017. While this may further restrict resource availability (Wiklund, Patzelt, and Shepherd 2009), we do not find this to affect the SMEs in our study, indicating instead a continuous focus on reducing costs across all industries and regions. This finding is of course very context-dependent but may provide policy makers with an incentive to apply continuous measures, regardless of industry dynamics.

In conclusion, we consider cost reduction as an important step in the CII process, especially at the market entry and upscaling stage, and encourage future research to consider how SMEs perform cost reductions and efficiency gains when attempting CII. Crossing industry lines involves risk, and as Cho and Orazem (2021) argue, the ability to take risks often results in more successful innovations and higher growth. We have not explored the connection between CII, cost reduction and growth here. However, before deciding on and presenting our final model in this paper, we conducted some analyses that indicated a relationship between cost reduction and growth, which we encourage future research to explore.

5. Conclusion

The aim of this paper is to show that CII is positive for SME growth, and in particular for different modes of growth. Thereby it contributes to the emerging literature on CII, which has primarily focused on the mechanisms for doing CII, instead of the outcomes of CII. We identify that orientation towards CII leads to SMEs' organic and acquired growth as soon as they move past the planning stage. We further indicate that SMEs pay attention to CII-related risks, as CII may require time and, resources. Therefore, SMEs pay an explicit attention to cost reductions, especially at the progressive CII stage.

Overall, our findings highlight the positive aspect of innovation across industry lines and demonstrate that CII is a favorable option for SMEs. Therefore, we recommend that SMEs explore and exploit CII opportunities whenever possible. Focusing on CII may motivate SMEs to seek a more explorative growth-oriented strategy, leading to greater versatility and diversity. In line with Hauge et al. (2017) viewing CII as positive for regional path renewal, we expect that this will result in less path-dependent SMEs that are better suited to withstand market fluctuations and industry shocks, and more equipped for larger societal changes, such as the green shift. The literature on path dependency has recently extended by including many forms of path development (Grillitsch, Asheim, and Trippel 2018), and while we view CII as an explorative innovation type, researchers may further explore other path mechanisms.

Thus, based on our findings, we argue that in today's changing business landscape, it is important to establish policies that facilitate CII. While we have mentioned some directions for policy development throughout the discussion, we would like to highlight that the clear connection between CII and SMEs' growth emphasizes the need for policymakers to further facilitate proactive CII to build more robust and diverse SMEs. Therefore, instead of directing policy efforts toward individual industries, policymakers should aim to connect SMEs from different industries and promote path renewal in conjunction with organic and acquired growth.

However, this study has limitations that should be addressed in future research. First, we focus only on Norwegian SMEs. Thus, the context of our study may lead to some generalizability limitations. We recommend extending future research to other countries and contexts, for example by comparing SMEs in advanced economies, such as Norway, and in emerging economies. Second, the research on CII is still at an early phase, and,

therefore, the measurement scale used for CII is not well established in the literature. Moreover, we relied on self-reporting while measuring CII, and thus applied the concept of CII in a broad meaning. Future studies should pursue developing an optimal CII measurement scale. Third, our sample included a broad range of SMEs with 5–250 employees. Further research may choose to focus on more specific SME segments, as CII leads to higher growth for larger SMEs. Fourth, we did not control for different types of spin-offs. Many firms establish spin-offs to reduce risks by separating tangible resources, such as buildings, from intangible resources. Such spin-offs are not innovation-driven, which might also explain why our findings show no significant relationship between CII engagement and spin-off establishment. Fifth, while industry affiliation had no significant effect on either growth mode or cost reduction in our study, we invite further research to consider specific industries separately. Sixth, as not all SMEs seek growth (Smallbone, Leig, and North 1995), it may be interesting for future research to differentiate between growth-oriented SMEs', and those SMEs that seek CII for other reasons. Seventh, while we have explained our reasoning for why CII leads to SME growth, we cannot exclude the possibility of endogeneity in our study. Finally, there is also a possible limitation in the internal validity of our study (Gripsrud, Olsson, and Silkoset 2010), as we have a limited number of control variables and cannot rule out other influencing factors, which future studies may address.

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Appendix A:Regression tables

	General growth	Organic growth	Acquired growth (M&A)	Est. spin-off	Cost reductions
Early stage CII	.553* (.282) †	.388 (.272)	.308 (.313) □	.302 (.309)	.676* (.299) †
Product/ service innovation	.604*** (.161)	.615*** (.167) †	.304 (.222)	.437 (.230)	.378* (.171) †
Process innovation	.350* (.158)	.252 (.161)	.462* (.203) †	.544** (.208) †	.270 (.168)
Demand for firms' products are shifting	-.129* (.059)	-.145* (.061)	-.008 (.076)	-.079 (.078)	.259*** (.065)
No. of employees in SME (ln)	.362*** (.104)	.353*** (.107)	.265* (.116) †	.251* (.122) †	.415*** (.105)
Firm age (ln)	-.496*** (.101)	-.503*** (.104)	-.124 (.117)	-.200 (.117)	.245* (.098) †
Firm is part of a larger corporation	-.551** (.180)	-.575** (.187)	.174 (.221)	-.679** (.261) †	.730*** (.202)
Random effects					
Firms nested in industries	.109 (.092)	.257 (.157)	5.22e-35 (4.78e-18)	7.98e-35 (8.49e-18)	1.01e-36 (1.49e-19)
Industries nested in economic regions	.222 (.199)	.354 (.266)	1.93e-33 (1.26e-17)	4.48e-33 (2.32e-17)	.370 (.270)
Wald χ^2	61.28***	55.85***	17.77* †	26.01*** †	58.33***
Log likelihood	-564.563	-574.041	-348.270	-334.222	-527.051
Number of firms	891	888	889	888	884

Regression table listing coefficients, standard errors in brackets. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, logistic multilevel regressions. †Not significant when accounting for overlap in both growth modes and CII stages. □ Significant when accounting for overlap in growth mode and CII stage.

	General growth	Organic growth	Acquired growth (M&A)	Est. spin-off	Cost reductions
Progressing CII	.666*** (.180)	.410* (.170) □	.577** (.184) □	.214 (.199) □	.589** (.190) □
Product/ service innovation	.588*** (.146)	.630*** (.147) †	.265 (.187)	.632** (.206) †	.286 (.155)
Process innovation	.331* (.143)	.232 (.141)	.378* (.170) †	.506** (.178) †	.329* (.152) †
Demand for firms' products are shifting	-.130* (.054)	-.163** (.053)	.068 (.063) □	-.011 (.066)	.262*** (.059)
No. of employees in SME (ln)	.342*** (.093)	.297*** (.091)	.306** (.109) †	.246* (.103)	.394*** (.097)
Firm age (ln)	-.504*** (.092)	-.507*** (.091)	-.072 (.104)	-.181 (.101)	.218* (.089) †
Firm is part of a larger corporation	-.411* (.162)	-.387* (.162)	.169 (.186)	-.502* (.213) †	.696*** (.184)
Random effects					
Firms nested in industries	.089 (.074)	.174 (.109)	.009 (.053)	2.52e-36 (3.56e-19)	.026 (.064)
Industries nested in economic regions	.273 (.166)	.322 (.172)	2.70e-33 (1.14e-17)	6.23e-34 (7.52e-18)	.427 (.239)
Wald χ^2	81.97***	76.06***	31.79*** †	33.25*** †	72.08***
Log likelihood	-696.877	-723.573	-482.154	-448.245	-653.100
Number of firms	1132	1129	1130	1129	1124

Regression table listing coefficients, standard errors in brackets. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, logistic multilevel regressions. † Not significant when accounting for overlap in both growth modes and CII stages. □ Significant when accounting for overlap in growth mode and CII stage. □ Variable omitted when accounting for overlap in growth mode and CII stage.

	General growth	Organic growth	Acquired growth (M&A)	Est. spin-off	Cost reductions
Mature CII	.649*** (.160)	.640*** (.156)	.407* (.177)	.028 (.189)	.370* (.165) †
Product/ service innovation	.579*** (.147)	.595*** (.149)	.251 (.192)	.695*** (.213) †	.271 (.155) □
Process innovation	.286* (.142) †	.190 (.141)	.387* (.172) †	.477** (.180) †	.330* (.150) †
Demand for firms' products are shifting	-.110* (.053) †	-.144** (.053)	.062 (.063)	-.005 (.066)	.255*** (.058)
No. of employees in SME (ln)	.351*** (.092)	.313*** (.091)	.308** (.098) †	.239* (.104) †	.397*** (.095)
Firm age (ln)	-.536*** (.092)	-.535*** (.091)	-.106 (.101)	-.186 (.103)	.208* (.087)
Firm is part of a larger corporation	-.447** (.161)	-.413* (.383)	.138 (.187)	-.513* (.215) †	.632*** (.180)
Random effects					
Firms nested in industries	.075 (.069)	.170 (.108)	5.78e-35 (1.71e-18)	9.98e-36 (7.58e-19)	.008 (.055)
Industries nested in economic regions	.210 (.147)	.272 (.155)	3.92e-33 (1.47e-17)	6.47e-33 (4.61e-17)	.316 (.209)
Wald χ^2	87.33***	86.01***	28.52***	31.64*** †	69.44***
Log likelihood	-690.716	-714.002	-474.537	-440.617	-649.436
Number of firms	1125	1123	1122	1121	1118

Regression table listing coefficients, standard errors in brackets. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, logistic multilevel regressions. † Not significant when accounting for overlap in both growth modes and CII stages. □ Significant when accounting for overlap in growth mode and CII stage.

	General growth	Organic growth	Acquired growth (M&A)	Est. spin-off	Cost reductions
Overall CII	.775*** (.145)	.638*** (.143)	.564*** (.172)	.010 (.177)	.424** (.148)
Product/ service innovation	.487*** (.148)	.539*** (.149)	.177 (.190)	.649** (.210) †	.234 (.155)
Process innovation	.279* (.142)	.182 (.141)	.352* (.170) †	.511** (.177) †	.320* (.149)
Demand for firms' products are shifting	-.128* (.053)	-.160** (.053)	.060 (.063)	-.014 (.065)	.263*** (.058)
No. of employees in SME (ln)	.381*** (.092)	.332*** (.091)	.317** (.109) †	.248* (.103)	.401*** (.094)
Firm age (ln)	-.515*** (.092)	-.513*** (.090)	-.083 (.104)	-.191 (.101)	.224** (.086)
Firm is part of a larger corporation	-.442** (.161)	-.415** (.161)	.171 (.185)	-.520* (.212)	.677*** (.179)
Random effects					
Firms nested in industries	.075 (.070)	.167 (.383)	.007 (.051)	2.57e-35 (3.17e-18)	.010 (.053)
Industries nested in economic regions	.270 (.170)	.318 (.173)	5.78e-34 (5.70e-18)	1.06e-33 (8.35e-18)	.342 (.210)
Wald χ^2	94.41***	87.44***	31.91***	32.79***	74.95***
Log likelihood	-699.855	-727.631	-484.582	-452.754	-663.213
Number of firms	1149	1146	1146	1145	1141

Regression table listing coefficients, standard errors in brackets. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, logistic multilevel regressions. † Not significant when accounting for overlap in both growth mode and CII stages.