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CAN ORGANIZATIONAL SPONSORS IMPRINT AND RE-IMPRINT NEW AND YOUNG ORGANIZATIONS

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Abstract
Thus, this paper combines imprinting and sponsorship theories to illuminate whether the rationale for government intervention in lowering the liabilities of newness for firms is justified, with important implications for theory development, policy practice, and entrepreneurs/firms receiving public support. Because government policies are often broad in their targets, they simultaneously seek to imprint unfounded firms and re-imprint incumbent young firms. Because initial imprints can be difficult to change, this study probes whether business incubation, a popular form of organizational sponsorship, has diverging influences on new and young firms. Theory suggests that young firms which are imprinted independently as opposed to new firms formed due to organizational sponsorship should have divergent responses to these types of intervention. Results from a population level study of Norway’s incubation industry show that indeed the effects of incubation and organizational sponsorship influence new firms differently than young firms in divergent ways during sponsorship and post-sponsorship. The results and conclusions of this study suggest that public policy and those seeking to support new and young entrepreneurial firms need to develop distinct strategies for how to facilitate the growth and survival of these two types of firms.

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Most governments, particularly within developed economies, offer entrepreneurs and new firms several types of pecuniary, administrative, and regulatory support to reduce their liabilities of newness. These schemes known in theory as organizational sponsorship exist because of the belief that governmental intervention can both improve the founding conditions for entrepreneurs and alter the growth trajectory of established firms. However, theoretically, the merits for these arguments are debatable and current empirical support for government intervention is thin and inconclusive. Thus, this paper combines imprinting and sponsorship theories to illuminate whether the rationale for government intervention in lowering the liabilities of newness for firms is justified, with important implications for theory development, policy practice, and entrepreneurs/firms receiving public support.

The implications of imprinting theory offer initial support to the argument that governmental policy aimed at new firms can improve their life-prospects. First formulated by Stinchcombe (1965), imprinting theory postulates that new organizations take on economic, institutional, and technological features of their environment at founding that persist overtime and are hard-to-change. Furthermore, imprinting is a multistage process through which firms experience a sensitive period under which they are highly susceptible to external influences (e.g. imprinters) (Marquis & Tilcsik, 2013). Thus, using the logic of imprinting theory, this paper looks at how one type of organizational sponsorship—business incubation—imprints new and young firms’ at their founding and improves their chances of survival and growth.

The link between imprinting theory and organizational sponsorship is quite direct. At its core, organizational sponsorship makes available additional resources to entrepreneurs in order to spur organizational formation (Flynn, 1993b). These resources whether financial, knowledge, or in-kind lending of space and equipment reduce the cost function of firms, forestall environmental
selection pressures, and increase legitimacy and social ties to established institutions. While in a firm’s founding these resources imprint the organization with resources, knowledge, and social capital that may enhance survival and growth trajectories, they may unintentionally impede performance once sponsorship ends or facilitate maladaptation to future environmental change.

In this study, imprinting is a process through which individuals, such as entrepreneurs and their emerging organizations develop characteristics that reflect prominent features of the environment that tend to be persistent despite the passing of time and environmental changes (Marquis & Tilcsik, 2013). Moreover, recent developments in imprinting theory suggest that firm founding is only one of several sensitive moments in time whereby organizations can be imprinted and, consequently, embark on new and better courses of action. Once founded, triggers of subsequent sensitive moments for organizational imprinting include leadership transitions, ownership changes, and structural rearrangement (Marquis & Tilcsik, 2013). Because imprinting at founding is vastly different from imprinting in subsequent sensitive moments in time, it is important to observe how these distinct moments of imprinting affect the overall performance of new and young firms. Thus, this study specifically investigates the question of how the imprinting and re-imprinting efforts by organizational sponsors affect firm size outcomes.

Because government policies are often broad in their targets (Bartik, 2004; Kettl, 2002), they simultaneously seek to imprint unfounded firms and re-imprint incumbent young firms. In cases, where governmental interventions target unfounded firms, the policy intervention can more directly target firms during their initial sensitive moment of imprinting. This is because the policy directly triggers and influences a firm’s formation at birth. On the other hand, in cases where governmental policies target established firms, imprinting has already occurred despite the young age of the firm and perhaps the policy may be less effective unless a sensitive moment for
re-imprinting emerges. Theory suggests that, in order to be effective, re-imprinting requires a sensitive moment in time when the organization is receptive for the imprinting effect of policy. Because sensitive moments are less common and more varied after founding, policy interventions may have low effectiveness when seeking to re-imprint. That is because the very first imprints persist strongly and an established course of action can be hard-to-change, leaving the effect of policy clearly disadvantaged.

However, some types of governmental policies explicitly incorporate a setting where existing organizations face a new sensitive moment and where they deliberate get out-of-balance. Arguably, in such settings mature organizations may be more open to be re-imprinted by policy interventions. However, the interaction between the effect of initial imprints and how the process of re-imprinting unfolds remains unclear (Simsek, Fox, & Heavey, 2015). In this study of incubated firms, a key contribution to the theory is our observation of firms that are first imprinted in the external environment of the incubator and subsequently re-imprinted in the incubator environment. Contrary to common wisdom, incubators serve two distinct types of firms. They recruit independently established firms that first exist in the environment outside the incubator but subsequently re-establish themselves at a young age inside the incubator. We view these cases as sensitive moments where incubators attempt to re-imprint young entrepreneurial firms by resetting the clock on their liabilities of newness. However, whether incubators actually have that ability to re-imprint young firms is an interesting theoretical and empirical question that we consider. According to imprinting theory, initial imprints are highly influential in setting a firm’s performance trajectory and hard to change once set (Marquis & Tilcsik, 2013). In addition, incubators also facilitate the founding of new firms within the incubator environment, which we see as the initial sensitive moment where incubators imprint firms for the first time.
Therefore, business incubators is an ideal setting for examining to what extent governmental policies are able to imprint and re-imprint organizations and whether these types of imprints truly enable firms to overcome their liabilities of newness.

Because there is much less research on sedimentation, the layers of imprinting and re-imprinting than on the initial processes of imprinting (Marquis & Tilcsik, 2013), a major contribution of this paper is also its ability to look at how incubation imprints newly founded firms and re-imprints young established firms. Not only is this contribution important to the development of imprinting theory but it is also important to the design of government policies that ignore these subtle differences in how organizations are conceived and formed (Schoonhove, Burton, & Reynolds, 2009).

The establishment of business incubators represents a particularly prominent case of governmental policies designed to improve new firms’ founding conditions and to create sensitive moments for new and young organizations (Schwartz, 2011). A business incubator represents a form of organizational sponsorship, which Flynn (1993a) defines as interventions by government agencies, businesses, and universities to create a resource munificent environment that is conducive to the birth, survival and growth of new firms. Recent research defines organizational sponsorship as “attempts to mediate the relationship between new organizations and their environments by creating a resource-munificent context intended to increase survival rates among those organizations” (Amezcua, Grimes, Bradley, & Wiklund, 2013). Examples of other forms of organizational sponsorship include the creation of publicly funded venture capital funds, the sharing of business intelligence through small business development centers, and the creation of tax and wage subsidies in specialized locations to encourage new business creation.
The research on organizational sponsorship is emerging but it falls in line with a related body of work that looks at how entrepreneurs strategically choose actions to reduce the liabilities of newness by deploying certain resources that buffer them from threats to survival and growth (Wiklund, Baker, & Shepherd, 2010). Recent research on this topic has shown that the effectiveness of organizational sponsorship in affecting the survival trajectories of young and new firms depends on the congruence between the types of support provided to the firms, the industry of the firms, and the firms’ fit in the localized industrial base (Amezcua et al., 2013). Another study on established firms found that sponsorship did not always improve market performance, because the resource accumulation triggered by sponsorship at times leads organizations to misallocate their resources (Jourdan & Kivleniece, 2017). Finally, another study on the motivations of incubators in emerging economies showed that their portfolio of services provided to new and young firms depended on both their own sources of sponsorship and the level of institutional and market development in the country (Dutt, Hawn, Vidal, Chatterji, McGahan, & Mitchell, 2016). Although the research on sponsorship is still developing, these noteworthy studies reveal that incubation and sponsorship generates unintended consequences in how it affects the behavior of young and new firms; thus, making sponsorship theory an excellent complement for integration with imprinting theory.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

The central tenant of imprinting theorizing, first advanced by Stinchcombe (1965), is that new organizations take on elements of their environment at founding and that these elements are persistent and hard-to-change. Among its most pertinent theoretical predictions is that historical conditions and constraints shape the structure and resources of organizations at vulnerable moments and that these persist to manifest themselves across time (Simsek et al., 2015). While
current research has masterfully shown that organizations are imprinted with strong implications for their evolution, the process through which imprinting occurs has been described as a theoretical black box (Simsek et al. 2015).

In line with recent theorizing, we see imprinting as a multistage process that consists of the following key elements: a sensitive moment of transition where the venture is particularly susceptible to external influences; an imprinting process where these external influences get "stamped" on the venture leading to certain characteristics; an evolution where imprinted characteristics persist, amplify, decay or transform; and a manifestation of the imprinted characteristics in terms of proximal or distal impacts on venture outcomes and performance (Marquis & Tilcsik, 2013; Simsek et al., 2015).

A key link between imprinting theory and organizational sponsorship theory is the act of selection. Selection processes affect the information and resources available to people, groups, and organizations. Further, selection occurs internally within organizations but also externally in the environment and it alters the mix of information and resources available to act upon (Aldrich & Reuf, 2006). In the imprinting literature, selection initiates the sensitive period where organizations are highly susceptible to external influences from imprinters and begin adapting certain characteristics from the environment. In organizational sponsorship theory, selection plays a critical role because due to limited resources the sponsor must select from the environment a limited number of new and young firms for sponsorship. A second commonality between the imprinting and sponsorship literatures is that resources are qualities of organizations that get imprinted and infused into new and young organizations in order to increase their survival, growth, and performance. Specifically, in the sponsorship literature, imprinting is
considered likely to occur due to high levels of organizational-boundary permeability at the early stage of an organization’s life cycle that allow external influences to enter (Flynn, 1993b).

INCUBATOR ENVIRONMENT AND IMPRINTING OF NEW VENTURES

The concept of imprinting views it as three successive processes regardless of whether the imprint is its first manifestation or a subsequent re-imprint. The first process, genesis, describes the initial interaction between the imprinter whose motives infuse characteristics upon the imprinted target. The second process, metamorphosis, explains the evolutionary process, through which imprints persist, amplify, decay, and/or transform. The third process, manifestations, reveals how the imprint directly and indirectly influences survival and performance outcomes. Taken as a whole, these successive processes provide a framework from which to empirically extend and test imprinting theory.

At the founding and birth stages of a new venture, the formation and evolution of initial imprinting represents a crucial aspect of imprinting theory, where a particularly prominent force imprints new ventures (Stinchcombe, 1965). This period also known as, genesis, represents what may be called the classical imprinting hypothesis. It explains how at founding a new venture by default exists in a sensitive moment of organization during which its characteristics form and are historically limited to its environmental context. Further, imprinting forces engrain these characteristics into the structure and behaviour of the organization in a manner where they persist longitudinally and therefore are hard-to-change (Simsek et al., 2015).

A key concern to recognize during this sensitive period of imprinting for newly founded firms is that the “organizational inventions that can be made at a particular time in history depend on the social technology available at that time” (Stinchcombe, 1965). Stinchcombe (1965) interpreted
this statement to mean that existing socially possible organizational forms limit the founding of a new organization. In other words, if the purpose of a new organization can be achieved with existing social technology, then the organization will emerge. Further, because newly formed organizations can function effectively with pre-existing organizational forms, and “because the forms tend to become institutionalized, the basic structure of the organization tends to remain relatively stable” (Stinchcombe, 1965)

In this paper, incubators represent a type of imprinter who possesses the most updated social technology and deploys it towards helping new and young firms establish their own organization forms. This is because incubators possess specialized resources, equipment, and knowledge conducive to forming and launching new firms (Schwartz, 2011). Thus, incubators provide an interesting setting that can be used to advance our understanding of how the initial environment of new firms can influence their growth trajectory. For one thing, incubators are a much-studied phenomenon where the literature has articulated some of the key benefits from being affiliated with an incubator, such as access to a resource munificent environment, a shelter from harsh market selection, access to institutional networks (Hackett & Dilts, 2004). Since incubators are typically sponsored by policymakers and indirectly by taxpayers, incubators can be seen as a large societal experiment that actively attempts to influence the founding environments of new firms. Thus, incubators represent an ideal environmental context to learn more to what extent, and particularly how, their initial founding environment imprints the growth trajectory of new firms.

The parallels between the activities of incubators, imprinting theory, and organizational sponsorship have many commonalities that would suggest that initial imprints from incubators influence the manifestations of newly founded incubated firms in markedly different ways from
young firms that first emerge outside the incubator environment and subsequently move into incubation. According to imprinting theory, at the genesis stage an imprinting process occurs where imprints occur in a sensitive period that is distinct from subsequent evolution and metamorphosis of the imprint. In this sensitive period, the newly forming organization adopts structures, routines, and capabilities that reflect resources and limitations of environmental conditions (Simsek et al., 2015). Because incubators are conduits between the latest social technology and environmental conditions, we perceive that those firms first founded inside incubators would have an advantage in selecting and developing stronger imprints than those who first need to navigate the environment unguided. The link between organizational sponsorship and imprinting theory lies in the deliberate efforts to alter the quality and variety of initial imprints at genesis. The logic and intent behind organizational sponsorship is to create a planned environment that deliberately offers a significantly higher level of resources to new organizations in order to increase their chances of survival and growth (Flynn, 1993a). Thus, we see this kind of activity as an effort to alter the quality and variety of imprints possible for new organizations at the genesis stage. Further, because firms created within incubators have easy and quick access to this richer imprinting environment at the conception and birth stages, we anticipate that they will perform at a higher level than firms conceived and born in the external environment that lacks cataloged and sorted imprints for selection.

H1a: Initial imprints from sponsors increase the resources of new organizations but not of young organizations.

H2a: Initial imprints from sponsors increase the resources of new organizations but not of young organizations with specific experience.
In the imprinting research, scholars know that there is a lack of insight and knowledge about how initial characteristics form in new ventures from the characteristics of the founding environment. For example, Simsek et al (2015) argue that “insufficient attention has been paid to the actual processes by which imprints form.” In line with this, Johnson (2007) argues that the “organizational imprinting hypothesis” is frequently cited but remains little understood” (Johnson, 2007). Because incubators draw firms from distinct environments and their mission is to infuse them with resources that should lead to similar outcomes for firms regardless of their origin, this is a unique setting to further shed light on these missing aspects of the theory. Therefore, the parallels between the activities of incubators, imprinting theory, and organizational sponsorship have many commonalities that would suggest that initial imprints from incubators increase the resources of newly founded incubated firms but not young firms that subsequently move into incubation. The initial sensitive period for firms that are born incubated is markedly different from those that are independently founded in the external environment and later get admitted into an incubation program. This is likely because firms that are born incubated likely were conceived and founded through close guidance and influence by their sponsoring incubator. This would also explain why a firm’s first registered address and establishment would be the same as that of its incubator sponsor. On the other hand, a firm conceived and founded outside of an incubator likely accessed different types of guidance and influence from networks not initially tied closely to the incubator. Otherwise, that firm would not be first established outside of an incubator.

H1b: Over time, imprints from sponsors increase the resources of new organizations more than those of young organizations conceived in the external environment.
H2b: Over time, imprints from sponsors increase the resources of new organizations more than those of young organizations with specific experience conceived in the external environment.

**INCUBATOR IMPRINTS ON ESTABLISHED VENTURES**

Up until quite recently, imprinting theory has mainly focused on one sensitive period of transition, namely the birth of a new venture. Most theorist argue that firms are most susceptible to imprinting at early and formative stages of development and at later sensitive stages (Marquis & Tilcsik, 2013). However, less is known about how, why, and when firms differ in their reception and response to imprinting influences over similar temporal or spatial conditions (Simsek et al., 2015). In other words, why in similar places or moments in time are some firms more vulnerable to imprinting than others are? The start-up period is far from the only sensitive moment that ventures may encounter during their life course. Established ventures can also face new sensitive moments such as entry into an incubator or soliciting other forms of organizational sponsorship. While it is currently unclear what a sensitive moment is in practice, it is agreed that these moments unsettle the established firm and make it receptive for new imprinting – or re-imprinting as it is also referred to.

However, our understanding of imprint formation during subsequent sensitive periods, how such imprint formation happen, interplay with prior imprinting, and influence the venture, is at best scarce. As Marquis & Tilcsik (2013:222) argue: “little attention has been given to the imprints that are formed during these transitions.” Subsequent sensitive periods after founding hold great theoretical relevance in imprinting theory (Simsek et al 2015). The reason is that during such subsequent sensitive periods, established ventures may yet again be receptive for the formation of new imprinting, from new environmental characteristics.
Note that the formation of new imprints during subsequent sensitive periods in *established ventures* and its associated processes is different from dynamics (persistence, amplification, decay) of initial imprinting in *new ventures*, which occur in the metamorphosis process. The formation of initial imprints during start-up occur in a setting which is common to all ventures (i.e. they need to be born) and in a context in which the venture is a “tabula rasa”, a clean slate, a context where there is no prior organization to influence the process of imprint formation. However, imprint formation during subsequent sensitive periods may be more complicated because "during these sensitive moments, the existing history of the entity can serve as an additional input to the process, since the organization is no longer a tabula rasa, or clean slate" (Simsek *et al* 2015:299). In fact, due to prior imprint experience the firm may be more vigilant about what kinds of social technology for organization it seeks to incorporate or to disavow. Further, because routines and processes may already be rigid and established, it may be harder for the firm to adapt new imprints unless there is a dire need for them.

New characteristics formed from re-imprinting may not wipe out initial characteristics formed during founding, but create additional layers of characteristics (Marquis & Huang 2010). It is suggested that the interplay between old and new imprints will influence the performance of established organizations. There is strong reason to believe that multiple subsequent sensitive periods hold the potential to unravel under, *which conditions* established ventures can alter their established course of action formed during previous sensitive periods. However, theorizing and empirical analysis of this issue is scarce (Aldrich, 2001).

Scholars have suggested that changes such as change of CEO, founder exit, transition from sole founder to team start-up represent subsequent sensitive moments. While we agree with these authors that these examples represent a sensitive moment, we nevertheless pursue a more theory
driven approach to what subsequent sensitive moments may be. We argue that a shift in institutional logics for established ventures represent a new sensitive moment for established organizations, which undertake and experience such shifts (Thornton, Ocasio, & Lounsbury, 2012). We argue that a shift from a market based logic outside the incubator to a protected resource munificent incubator environment represent a shift in institutional logics for established companies, making them receptive to re-imprinting from the new environment and its institutional logics.

Institutional logics represent a coherent set of assumptions and values about what are perceived as rational, necessary, and appropriate behaviour for an organization. These deeply embedded cognition and preferences among organizational members influence how they interpret and respond to relationships with others. In contrast to simpler explanations of action among firms where resources and incentives explain behaviour, institutional logics research attempts to offer a more accurate explanation for firm behaviour (Pahnke, Katila, & Eisenhardt, 2015).

Past research shows that different types of partners, stakeholders, and investors may bring distinct institutional logics to bear in their interactions with young firms, leading to differences in young firms’ actions in response (Vasudeva, Zaheer, & Hernandez, 2013). Types of partners differ in their values and expectations about the appropriate processes for running a new firm and may in turn influence the advice provided to, choices made by, and performance of young firms. This kind of influence has been shown in how governments, banks, and venture capitalists related to new ventures and how new ventures then use these institutional logics with markedly different outcomes in performance (Pahnke et al., 2015).

H2a: The metamorphosis of initial imprints is more robust and less susceptible to evolutionary change for firms that are more experienced prior to incubation
H2b: The metamorphosis of initial imprints is more robust and less susceptible to evolutionary change for firms with more sales and market experience prior to incubation.

H3a: The metamorphosis of initial imprints is more robust and less susceptible to evolutionary change for firms that are more experienced prior to incubation.

H3b: The metamorphosis of initial imprints is more robust and less susceptible to evolutionary change for firms with more specific experience prior to incubation.

DATA AND METHODS

Sample

Unlike most previous studies that use small, non-random samples, often selected by incubator sponsors (McAdam, Galbraith, McAdam, & Humphreys, 2006), the present research represents the population of publicly sponsored business incubators in Norway—and incubated firms within them—spanning the years 2013—2015. That is, if a firm was incubated in one of Norway’s publicly sponsored incubators in one of the years between 2013 and 2015 they are part of the population of interest. Because we use the whole population of incubated firms during the time period, the study benefits from reducing the type of bias that is often generated through sample selection (Moore & McCabe, 1996).

Our data-gathering process generated a complete consensus of publicly supported Norwegian business incubators and their incubated firms. SIVA, an organization responsible for overseeing the considerable public funding of Norwegian business incubators, is required to maintain and report listings of all Norwegian incubators and their incubated firms to the Norwegian government on an annual basis. We gained access to these listings. Together with the head of the incubator program in SIVA, we manually combed through the list of incubators and incubated firms to ensure the list’s integrity, and quality. These steps identified 39 incubators and 1036 incubated firms. Drawing from the definition of incubation and the entrepreneurship literature,
we narrowed down our sample to include only organizations deemed to be new and young firms (i.e., less than 5 years old). This lead to a final population of 687 new and young firms. We followed these incubated firms annually from their birth until the end of the fiscal year, 2015.

All Norwegian organizations are assigned a unique identifier upon registration. This unique identifier can be used for accessing their annual financial reporting. SIVA provided us with the incubators’ and incubated firms’ unique identifier. Subsequent annual financial accounting data were provided by the Norwegian business registries upon our request.

Some of the firms in question have gone through re-registrations in the business registers. This can happen as a consequence of changing the organizational form, e.g., converting the firm from a ‘foundation’-type organization to a limited liability company. Other firms’ activities were transferred from a sole proprietorship to a limited liability venture after the firms were mature and well established. Because of this, all firms went through a manual screening process where the firms in question were scrutinized. If the registration dates seemed out of order, on-line searches were used to identify whether the anomaly was a reason for concern. Possibly, due to the extensive screening process performed beforehand, no firms were excluded in this process.

**Variables and Measures**

*Dependent variable.* Our dependent variable is sales, which is a relevant firm performance measure, particularly when firms are young. Of the 687 firms in our sample, 521 firms had attained sales during their life cycle (by the end of 2015), whereas 166 firms failed to do so. These firms are still included as to reduce bias from case exclusion. The highest recorded sales value was ≈ 280M NOK—or ≈ 33M USD—belonging to a specialist ship manufacturing firm. The mean value of highest recorded sales was ≈ 2.2M NOK, or ≈ 2.98M, when excluding firms
that failed to achieve any sales. Overall, the highest recorded sales per firm had a fair amount of variation (sales ≈ 13486 NOK), which was to be expected due to the varying degrees of success (sales ≈ 15420 NOK when excluding those failing to achieve any sales), and the rich selection of industries within the sample (controlled for in the analysis).

*Independent variables.* The traditional imprinting hypothesis is that their founding environment imprints new firms. Since it is suggested that firms are put on a course at founding from imprinting that may be hard to change, we include the age of the firm upon entry into the incubator. This variable tracked the age of the firm on a yearly basis up until entry. On entry, the variable was set to the age of the firm at that point and kept constant for the rest of the panel. We chose this technique to avoid predicting the effects of firm age on entry before the firms entered incubation. A variable representing the cumulative number of years where the firm had sales was included in the model to capture actual sales experience. Since (re)imprinting is a process, we included time incubated in our analysis. However, since this effect may be decreasing over time, we included time incubated squared, as to ascertain if the relationship of time incubated is curvilinear.

The variables of age of the firm upon entry and number of years with sales experience were interacted with time incubated, indicating whether the incubation process were more or less effective for young or new firms, or for firms with more or less sales experience. The same variables were also interacted with time incubated squared as to determine whether the diminishing returns from the incubation process were smaller or greater depending on firm age upon entry and sales experience upon entry. These interactions served as a basis for testing whether the incubator can effectively re-imprint older, more experienced, firms and
simultaneously imprint younger and new firms. The interactions also help us compare the
strength and duration of these imprints on both types of firms.

Since business incubators are supposed to help firms prosper in the post-incubation period the
age of the firm upon entry and number of years with sales experience variables above were
interacted with a binary variable, post (0 = false, 1 = true), indicating whether the firms’ had
entered post-incubation. In practical terms, these interactions serve as indicators to which extent
the incubation process has led to overall increases in sales after the firm has left the incubator. As
to keep the pre-entry period as the reference group, we also included the binary variable inside (0
= false, 1 = true).

Control variables. The first control variable was time incubated. While it is possible to perform
the panel analysis so that time is included as a separate group in addition to the firm, this
technique assume a linear effect from time on sales. Including the individual years themselves,
however, allow to control for the effect of a given year. This is useful due to the economic
turmoil, which have swept over Europe during the duration of the panel. Since the variable age
of the firm upon entry becomes time-invariant upon entry into the incubator, we also include the
firms’ age in the models. Industry heavily influences the firms’ expected sales. Therefore, we
also control for the firms’ industry but do not report these statistics in our tables due to space
limitations.

Model and Techniques for Analysis

Since the measures of age of the firm upon entry, and number of years with sales pre-entry are
essentially time-invariant in nature, we ruled out using fixed effect panel regression for testing
our hypotheses. Instead we followed Canella et al. (2015)’s example and used a random effects estimator with robust standard errors (Allison, 2009; Greene, 1997).

Due to the nature of the data, some firms were founded before or terminated before others and many of the firms were still active by the end of the panel—2015. Hence, the panel was unbalanced, something we took into account in our analyses. Additionally, our model specification take into account the nesting of organizations within incubators, by using robust clustering when estimating standard errors.

Descriptive statistics and correlations appear in Table 1. The means and standard deviations seem reasonable overall, but noting high correlations between several independent and control variables, we followed the approach recommended by Aiken et al. (1991) of mean centering non-dichotomous variables in interaction terms to attenuate the possible effects of multicollinearity where applicable. Additionally, we conducted diagnostic tests for multicollinearity by examining variance inflation factors (VIFs) prior to, and following, the mean centering interaction terms using a pooled ordinary least squared model. In all models, the mean VIFs were higher prior to mean centering, with the VIFs well below critical values of five (excluding interaction terms) (Kutner, Nachtsheim, & Neter, 2004).

As an added robustness test, we also modeled the panel as a mixed-model using restricted and ordinary maximum likelihood. While these techniques have stricter distributional assumptions than the GLS approach with robust standard errors, we found that all models behaved similarly. The only model whose p-values deviated substantially between the approaches was found by a Wald-test (table 2) to be non-significantly different from the base model and was therefore rejected in any case.
Analysis

Our study asserts that firms with more general experience and more specific experience in particular tend to perform better than those on the other end of the spectrum, and that the time spent in incubation has an overall positive—but curvilinear and diminishing—effect for these firms over time. Table 2 provides evidence to support these assertions, reporting that there is a statistically significant, positive, relationship between general (age on entry; p < 0.1) and specific (year sale entry; p < 0.01) experience, and time incubated (time incubated; p < 0.01) on sales. It also provides evidence of the presence of a negative curvilinear effect (time incubated²; p < 0.01), showing that the effect of being incubated diminishes over time.

Somewhat surprisingly, the effect of the control variable age is negative. This is likely due to the downward trajectory some of the most experienced firms seem to have upon and during incubation, as will be demonstrated later in this analysis.

Hypothesis 1a predicted that initial imprints from sponsors increase the resources of new organizations but not of young organizations. Table 2, Model 2 provides evidence of this being the case in terms of general experience (time incubated age on entry; p < 0.01). The higher the age of the new firm upon entry, the weaker the effect of the time spent under incubation. An even more powerful way of illustrating this effect can be found in an interaction plot (Figure 1): those firms that are the oldest seem to have a greater initial effect of the time spent in incubation (higher intercept), but this effect is rapidly overtaken by younger firms (note that these interactions use min and max values for age as mean centering as that would exclude new firms.) This also provides initial support for hypotheses 1b.
Hypothesis 1b predicted that, over time, imprints from sponsors increase the resources of new organizations more than those of young organizations conceived in the external environment. Table 2, Model 2 provides evidence of this being the case (time incubated\(^2\): age on entry; p < 0.1). When plotting this interaction (Figure 2) it becomes apparent that while new and young firms initially experience stronger effects from time spent in incubation (hypothesis 1a), this effect is decreasing over time. Contrary to our hypothesis, the plot shows that as the initial age of entry increases, the rate of decline from the effects of time spent inside the incubator decreases. In other words, the older the firm upon entry, the longer it takes for the effects of spending time inside the incubator to diminish. Taking both hypothesis 1a and 1b into account, our findings show that both young and new firms have a positive effect from time spent inside the incubator, but new firms more so. However, this effect diminishes more rapidly for new firms.

Hypothesis 2a predicted that initial imprints from sponsors increase the resources of new organizations but not of young organizations with specific experience. Table 2, Model 3 provides evidence that this is the case (time incubated year sales entry; p < 0.01). Plotting the interaction provides further evidence (figure 3): the more specific experience the lower the effect of time spent in incubation. For the firms with the most specific experience (4 or 5 years of sales pre-entry), the overall effect of time spent in the incubator is overall negative, possibly illustrating adverse effects of the incubators’ attempts at re-imprinting these firms.

Hypothesis 2b predicted that, over time, imprints from sponsors increase the resources of new organizations more than young organizations conceived in the external environment. Table 2, Model 3 provides evidence that this is the case (time incubated\(^2\): year sale entry; p < 0.1). When plotting this interaction (figure 4) it becomes apparent that while firms lacking specific experience initially experience stronger effects from time spent in incubation (hypothesis 2a),
this effect is decreasing over time. Contrary to our hypothesis, the plot shows that as years of sales experience prior to entry into incubation increases, the rate of decline from the effects of time spent inside the incubator decreases. Thus, young firms in incubation rather new firms in incubation tend to be more resilient to negative drawbacks of incubation. Taking both hypothesis 2a and 2b into account, our findings show that firms lacking in specific experience a positive effect from time spent inside the incubator, while the opposite is the case for firms with high degrees of specific experience. However, the positive effect diminishes rapidly for firms lacking specific experience, while the negative effect from time spent in the incubator diminishes for firms with high degrees of specific experience.

Hypothesis 3a predicted that the metamorphosis of initial imprints is more robust and less susceptible to evolutionary change form firms with general experience prior to incubation. Table 2, Model 4, supports this. However, the Wald-test comparing this model to the base model without the interaction was non-significant, indicating that adding this interaction effect provided no improvement of model fit. Thus, we find inadequate support for hypothesis 3a.

Hypothesis 3b predicted that the metamorphosis of initial imprints is more robust and less susceptible to evolutionary change form firms with specific experience prior to incubation. Table 2, Model 5 indicates that this is the case (p < 0.01). An interaction plot (figure 6) provides more evidence. The more specific experience the higher the sales in the post-incubation period. The newest firms on the other hand did better than when inside the incubator. This provides support for hypothesis 3b.
CONCLUSION

The results of this study shed light on the challenges that organizational sponsorship faces in imprinting and re-imprinting new and young firms for advanced growth and success. While initially new firms thrive in the incubation environment compared to young firms by being of larger size in terms of sales, they also experience to diminishing returns to size as the incubation period extends. Thus, for new firms founded inside incubators, the best course appears to be to receive a short and intense dosage of incubation to get the highest returns from sponsorship because of the curvilinear effects of incubation on size.

On the other hand, firms with more specific experience measured as years with sales, those with higher sales experience appear initially resist re-imprinting in comparison to their newly formed inside the incubator counterparts. However, over time those with more sales experience initially also do better if they remain in the incubator for longer. This suggests that sponsorship takes a longer time to take hold on already established firms and thus it supports the initial imprinting hypothesis and the institutional logics reasoning that once an organization cements its cognitive and operational routines that it is harder to reshape and reform them.

Regarding the evolution and metamorphosis of initial imprints, this study shows that more years of experience, especially in sales, leads to larger organizations surviving post-incubation. Firms with more years of experience sales experience are significantly larger after incubation than those with less years. This effect is seen after accounting for external factors like industry, age, time incubated, and time fixed effects. A recommendation from these results suggests that incubators should focus on selecting firms with higher levels of experience. However, taking into account the results that show that incubation services take longer to influence formerly established firms, it suggest that separate and different incubation paths are needed for firms. A
one-size fits all incubation program does not seem to work according to this population level study of incubated firms and incubators in Norway.

In terms of contribution to theory, this study begins to shed light on how imprinting and re-imprinting is more complex when dealing with new and young firms. Most of the theory on imprinting begins with the assumption that firms first emerge, they grow, and as established fully selected entities eventually re-imprint. However, in the incubation environment, we are witnessing the imprint and re-imprint process in a short span with significant divergent results based on experience and specific types of experience. Thus, this study calls for more nuanced imprinting theory that takes into the early span of influences and re-influences posed on new and young firms as they attempt to find their place in the market.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Sales</th>
<th>Age</th>
<th>Inside</th>
<th>Post</th>
<th>Founded outside</th>
<th>Time incubated</th>
<th>Time incubated (squared)</th>
<th>Age of firm upon entry</th>
<th>Cumulative years with sales</th>
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<tr>
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<td>1835754</td>
<td>10035449</td>
<td>1.946</td>
<td>0.636</td>
<td>0.159</td>
<td>1.696</td>
<td>4.737</td>
<td>1.119</td>
<td>0.589</td>
<td>1.325</td>
<td>1.016</td>
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<tr>
<td>Age</td>
<td>1.747</td>
<td>1.11***</td>
<td>1</td>
<td>0.481</td>
<td>0.366</td>
<td>1.364</td>
<td>7.26</td>
<td>-0.02</td>
<td>-0.02</td>
<td>0.14****</td>
<td>0.18****</td>
</tr>
<tr>
<td>Inside</td>
<td>-0.04*</td>
<td>-0.10****</td>
<td>1</td>
<td>-0.04*</td>
<td>0.44****</td>
<td>0.57****</td>
<td>0.53****</td>
<td>0.56****</td>
<td>-0.24****</td>
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<tr>
<td>Post</td>
<td>1.747</td>
<td>0.481</td>
<td>-0.04*</td>
<td>-0.04*</td>
<td>0.44****</td>
<td>0.57****</td>
<td>0.53****</td>
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<tr>
<td>Time incubated</td>
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<td>-0.04*</td>
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<td>0.44****</td>
<td>0.57****</td>
<td>0.53****</td>
<td>0.53****</td>
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<td>Time incubated (squared)</td>
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<td>-0.04*</td>
<td>-0.04*</td>
<td>0.44****</td>
<td>0.57****</td>
<td>0.53****</td>
<td>0.56****</td>
<td>-0.24****</td>
<td>-0.24****</td>
<td>-0.21****</td>
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<tr>
<td>Age of firm upon entry</td>
<td>1.364</td>
<td>1.11***</td>
<td>1</td>
<td>0.366</td>
<td>0.159</td>
<td>1.696</td>
<td>4.737</td>
<td>1.119</td>
<td>0.589</td>
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<td>1.016</td>
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<tr>
<td>Cumulative years with sales</td>
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<td>-0.24****</td>
<td>-0.16****</td>
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(* p < 0.05, ** p < 0.01, *** p < 0.001, **** p < 0.0001) Note: Year dummies excluded due to space limitations but are available upon request.
**TABLE 2**

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<td><strong>log(sales)</strong></td>
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<tr>
<td>Age</td>
<td>-0.162* (0.097)</td>
<td>-0.113 (0.104)</td>
<td>-0.191** (0.079)</td>
<td>-0.161* (0.097)</td>
<td>-0.164* (0.093)</td>
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<td>Inside</td>
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<td>0.152** (0.070)</td>
<td>0.173*** (0.040)</td>
<td>0.009 (0.035)</td>
<td>0.021 (0.030)</td>
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<td>Post</td>
<td>0.173* (0.103)</td>
<td>0.254*** (0.091)</td>
<td>0.373*** (0.095)</td>
<td>0.224** (0.106)</td>
<td>0.249** (0.104)</td>
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<td>Time incubated</td>
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<td>0.537*** (0.092)</td>
<td>0.598*** (0.073)</td>
<td>0.512*** (0.095)</td>
<td>0.508*** (0.092)</td>
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<tr>
<td>(Time incubated)**</td>
<td>-0.025*** (0.006)</td>
<td>-0.034*** (0.006)</td>
<td>-0.031*** (0.005)</td>
<td>-0.026*** (0.006)</td>
<td>-0.025*** (0.006)</td>
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<tr>
<td>Age on entry</td>
<td>0.147* (0.089)</td>
<td>0.230*** (0.064)</td>
<td>0.194** (0.076)</td>
<td>0.153* (0.082)</td>
<td>0.150* (0.083)</td>
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<tr>
<td>Year sales ent.</td>
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<td>0.491*** (0.074)</td>
<td>0.675*** (0.050)</td>
<td>0.514*** (0.078)</td>
<td>0.526*** (0.067)</td>
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<tr>
<td>Time incubated : Age on entry</td>
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<tr>
<td>(Time incubated)** : Age on entry</td>
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<td></td>
<td></td>
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<tr>
<td>(Time incubated)** : Year sales ent.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Post : Age on entry</td>
<td></td>
<td></td>
<td>-0.045* (0.025)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post : Year sales ent.</td>
<td></td>
<td></td>
<td></td>
<td>-0.086*** (0.032)</td>
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<tr>
<td><strong>Constant</strong></td>
<td>11.711*** (2.147)</td>
<td>11.213*** (1.752)</td>
<td>11.415*** (1.846)</td>
<td>11.662*** (2.047)</td>
<td>11.689*** (2.113)</td>
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<td><strong>Wald – test of nested models</strong></td>
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<tr>
<td></td>
<td>–</td>
<td>p &lt; 0.001</td>
<td>p &lt; 0.001</td>
<td>p = 0.146</td>
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<td>177.746***</td>
<td>178.129***</td>
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*While we control for industry and time fixed effects, we do not report these due to space limitations. The results are available upon request.*

*p<0.1; **p<0.05; ***p<0.01*
Figure 1

Interaction effect of age on entry and time incubated on log(sales)

Figure 2

Interaction effect of age on entry and time incubated (squared) on log(sales)
Figure 3

Interaction effect of number of years with sales (pre-entry) and time incubated on log(sales)

Figure 4

Interaction effect of number of years with sales (pre-entry) and time incubated (squared) on log(sales)
Figure 5

Interaction effect of age on entry and post status on log(sales)

Figure 6

Interaction effect of number of years with sales (pre-entry), and post status on log(sales)
References


