

# **How Labour-Market Institutions Influence Team Formation in Start-Up Ventures**

**Paper Draft**

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## **Abstract**

The political economy literature on ‘Varieties-of-Capitalism’ demonstrates that, and how, the composition of a firm’s human resources is shaped by national labour-market institutions. As these institutions drive firms to pursue human-resource strategies in line with the comparative advantages offered, systematic differences exist between countries in the skill profiles of corporate workforces.

Importantly, though, this causal link has only been established for incumbent firms, whereas the process of skill composition in start-up ventures remains understudied. While entrepreneurship research theorizing about the impact of institutions on the behaviour of start-up firms exists, such cross-national studies mostly focus on different outcomes of start-up firms, for example their number of employees. Questions about the ways and moments in which national institutions influence the formation of start-up teams remain unanswered.

To address this research gap, we analyze the start-up processes of 344 ventures in Germany and the US, offering particularly typical examples of countries with regulated and deregulated labour-market institutions respectively. Based on optimal matching techniques, we illustrate how team formation processes differ over time in terms of founder and employee involvement and the hiring of service providers. Furthermore, we use binary logistic regressions to identify the extent to which national labour-market institutions account for these differences.

**Keywords:** Labour-market institutions; Entrepreneurship; Team Formation; Varieties-of-Capitalism; Optimal Matching; New Venture Creation

**JEL Classifications:** L26

## 1. INTRODUCTION

With his seminal article “Who is the entrepreneur is asking the wrong question”, Gartner (1988) initiated a new paradigm in entrepreneurship research. Instead of focusing on the characteristics of entrepreneurs, scholars began to research the entrepreneurial process. While it is now widely accepted that entrepreneurship indeed is a process that unfolds over time instead of a singular act, different conceptualizations of the process have emerged (Moroz & Hindle 2012). We here follow the conceptualizations of entrepreneurship as the process of venture creation (VCP), a conceptualization now considered to be central to entrepreneurship research (Davidsson & Gordon 2012).

But even among those who understand entrepreneurship as the creation of ventures, a variety of ways to define and operationalize VCPs exist and our knowledge about it remains limited (Samuelsson & Davidsson 2009). The literature on VCPs and venture growth has produced a variety of perspectives on how ventures are created of which the two most prominent ones are stage based models and activity based models (Moroz & Hindle 2012). *Stage based models* postulate that all ventures, just like organisms, go through the same, predetermined stages in their development (Levie & Lichtenstein 2010). Hence, the underlying concept of VCPs is a passive one that assumes a ‘natural’, almost automatic progression through the different stages, thereby putting little emphasis on the activities and choices of the entrepreneur. In contrast, *activity-based models* conceive a VCP as the number and sequence of singular gestation activities occurring throughout the VCP (Carter et al. 1996). The result is a rather active VCP concept explicitly focusing on the actions of the entrepreneur. In fact this approach assumes that the very activities the entrepreneur chooses to undertake from an eclectic list of possible activities form the VCP. Despite these substantial differences, neither perspective has yet produced a coherent, widely accepted conceptualization of the VCP (Levie & Lichtenstein 2010; Davidsson & Gordon 2012).

The most recent literature on venture creation argues that this conceptual failure has methodological origins: Existing studies do not analyze the VCP as the unit of analysis but rather treat entrepreneurship as a linear succession of distinct stages or a number of singular gestation activities (Hjorth et al. 2015; McMullen & Dimov 2013; Garnsey et al. 2006). This often leads to the use of methods not optimal for studying processes (Van de Ven & Engleman 2004; Langley et al. 2013; Gordon 2012): More concretely, (Aldrich 2001) distinguishes between outcome-driven (variance) and event-driven (process) explanations for questions in the field of organizational theories. While variance-driven studies are suitable to explain change through deterministic causation, process-driven studies consider every action and how they form one process unit (Poole et al. 2000). Because the vast majority of publications has employed variance explanations, they are able to answer questions about antecedents and outcomes of the entrepreneurial process, but little progress has been made to explain how said process unfolds (Van de Ven & Engleman 2004; Ruef 2005).

Furthermore, it has been argued that important heterogeneities between different ventures and venture creation contexts make it difficult to uncover patterns in VCPs. In order to be able to produce meaningful descriptions of VCPs, different characteristics of ventures, as well as the context of their creation, need to be taken into account and controlled for (Gartner & Shaver 2012; Samuelsson & Davidsson 2009).

Taken together, the different literature strands on VCPs thus provide inconclusive results about whether VCPs are 'order or chaos'. Yet, this question has become ever more important in view of the increasing number of countries that implement policies to stimulate economic growth through entrepreneurship. While we know of the differences in the level of entrepreneurial activity between countries, the lack of knowledge about VCPs means that we do not know if the processes underpinning entrepreneurial activity also differ between countries. Yet, we need to understand if, and how, national institutions shape VCPs in order to decide whether one optimal blue print for the stimulation of entrepreneurship exists, or whether entrepreneurship policies have to be adapted to VCPs shaped by national institutions.

In order to address this research gap, we here focus on the most essential process within venture creation, namely the one of team formation (TFP). The process of team formation describes the assembly of a venture's most crucial resource: human capital. A great number of studies have found that the human capital embodied by a venture's founders is the most significant predictor for a venture's survival and growth (Cooper et al. 1994; Colombo & Grilli 2005; Bates 1990; Delmar & Shane 2004; Bosma et al. 2004). Building on these insights, recent studies on team formation argue that employees contribute in similar fashion to a venture's human capital and subsequently its survival (Koch et al. 2013; Weber & Zulehner 2010; Coad et al. 2016; Dahl et al. 2015). Consequently, we conceptualize the team formation process as the time commitments of founders, employees and service providers at any time between inception of the venture and the point it reaches profitability or exits.

Accordingly, our research addresses the above gaps in the VCP literature by asking:

*Do distinct types of team formation processes exist, how do they differ and which structural characteristics can explain these differences?*

Our project answers these questions by taking a new methodological and empirical approach: We apply optimal matching (OM) and clustering techniques to the novel data of the 'Perfect Timing' dataset, reporting the venture creation processes of 344 start-up firms on a monthly basis. Owing to OM analyses and clustering techniques, we are able to study entire VCPs as the unit of analysis and thus, to identify distinct team formation processes on the basis of the team formation activities undertaken, their timing and duration.

In short, these OM analyses demonstrate that team formation is ‘order’ rather than chaos as distinct temporal patterns of team formation exist with regard to the time commitment of founders as well as the extent to which employees and service providers are hired. Importantly, we are able to identify a finite number of approaches for each of these three team-formation dimensions. Furthermore, simple correlation and regression analyses illustrate that the approaches in one dimension are only weakly correlated to the approaches of the two other dimensions: The time commitment of founders is only weakly correlated with the hiring of employees or service providers. Finally, binary logistic regression analyses reveal that structural characteristics, in particular the country and degree of innovation of the new venture, influence which team formation approach is pursued.

To illustrate these findings the paper proceeds as follows: In section 2, we begin with a short review of the literatures on entrepreneurial processes in general and team formation in particular. In doing so, we highlight the opposing views of the stage-based and activity-based approaches. In section 3, we present the data and methodology employed, while we present our results in section 4. In section 5, we discuss these findings and their limitations in the context of previous research and the methodology used. Importantly, we also reflect on the opportunities for future research based on OM techniques.

## **2. THEORY**

So, what do the different literature strands on team formation processes (TFPs) teach us about how these may evolve? **Is team formation random or evolving along systematic trajectories?** The *stage based literature* was the first to address this question. Here, venture creation in general, as well as team formation in particular, are commonly depicted as a series of prescribed stages (Levie & Lichtenstein 2010; Phelps et al. 2007). With regard to team formation, many stage models describe a process of continuous growth which, in the beginning, is centered on the role of the founder(s). (Kazanjian & Drazin 1990) and (Kaulio 2003) for example posit that, during the first stage of venture creation, the founder(s) work on a prototype or idea. Once the prototype has been created, more founders or core employees join the team in order to work on the products’ commercialization in a second stage. Once a commercially viable product has been created, the venture enters into the stage of growth, during which more employees and service providers join to the team. Hence, team formation is described as a linear process during which the team grows from one to many founders who increasingly hire employees as time goes by.

The *gestation activity literature* instead portrays team formation as non-linear processes, which are characterized by a variety of activities that can occur at different stages throughout the venture creation process, such as organizing the founder team, switching between part- and full-time work, and hiring employees (Reynolds & Miller 1992; Gatewood et al. 1995; Carter et al. 1996). While these studies establish that more than one team formation process exists, they only provide snap-shot

insights into the frequencies with which different team formation activities take place at different moments of the start-up process.

To give some examples, (Gartner et al. 2004) analyze the first start-up activity carried out by new ventures and find that only few ventures start with activities related to team formation, such as ‘organizing the start-up team’ (6%), getting ‘devoted full-time’ (2%) or ‘hiring employees’ (<1%). Another study investigates the sequence of individual start-up activities, distinguishing between successful, interrupted and ongoing venture creation processes: In this study, (Carter et al. 1996) illustrate that the majority of successful ventures organize the founder team in the second quarter after venture inception, while at least one founder switches to full-time work at the same time. In the following quarter, the first employee is hired. In contrast, founders who give up on venture creation mostly organize the founder team in the first month after inception but wait for one year before switching to full-time work. By contrast, founders of unsuccessful ventures, characterized by ongoing venture creation processes, organize the founder team in the second quarter after venture inception but never switch to full-time work, nor hire any employees.

In sum, while some scattered evidence exists, systematic insights into how team formation evolves over time with regard to founder involvement, the hiring of employees or other types of labor are still missing (Jaspers & Hak 2013; Gordon 2012). That said, it is interesting to note that the activity-based literature agrees with the stage-based literature in that team formation process are not random but follow distinct patterns. Yet, contrary to the stage-based literature, the activity-based literature holds that these patterns do mostly not follow a linear growth process and are context-dependent (Liao et al. 2005; Gartner & Shaver 2012).

***Beyond the stage- and activity-based literatures***, various research strands provide insights into individual aspects of team formation without explicitly positioning their findings within the overall team formation process. These aspects include: the *development of founder teams*, the *time commitment of founders* including part-time entrepreneurs as well as their transition to full-time entrepreneurship, the *hiring of employees*, and the *engaging of service providers*.

Those few studies that analyze the *development of founder teams* illustrate that founder exit is more likely than founder entry throughout the TFP (Hellerstedt 2009). Furthermore, the initial number of founders seems to influence subsequent founder exit and entry. However, the exact effect remains unclear: While some authors argue that the likelihood of founders exiting or additional founders joining the team is higher for bigger teams (Chandler et al. 2005; Hellerstedt 2009), others observe the opposite effect (Ucbasaran et al. 2003). Yet, researchers investigating founder team development largely concur in their observation that the number of founders overall remains stable throughout the TFP in most ventures (Hellerstedt 2009).

A further research strand, known as the literature on part-time or hybrid entrepreneurship, illustrates that not only the number of founders can vary throughout TFPs but also their *time commitment*. (Wennberg et al. 2006) were one of the first to argue that besides the traditional dichotomy of being an employee and a full-time entrepreneur, the possibility of creating a venture in part-time exists. Several empirical studies show that a significant amount of founders actually choose to do so, whereby the exact amount of part-time founders (or hybrid entrepreneurs) varies strongly between countries. In Germany, for example, 64% of ventures created in 2013 were set-up by part-time founders (Metzger 2014). The opportunity to test one's own abilities as a founder, while reducing the financial and labour-market risks related to full-time entrepreneurship, is mentioned amongst the most important motives for part-time entrepreneurship (Raffiee & Feng 2014; Folta et al. 2010).

More recent studies on hybrid entrepreneurship show that entrepreneurs do not necessarily remain part-, or full-time entrepreneurs for the entire duration of the TFP, but in-, or decrease their time commitments throughout the TFP (Folta et al. 2010; Block & Landgraf 2016). For example, (Block & Landgraf 2016) find that 20% of full-time founders in their study of German founders initially started out as part-time founders, whereby it remains unknown when, precisely, these switches from part-time to full-time entrepreneurship occurred.

Even though considered a key decision for young ventures, surprisingly little is known about the *hiring of employees* (Cardon & Stevens 2004). One problem is that most studies that explore the initial size of ventures ignore small ventures which arguably make up the vast majority of ventures. Consequently, only scattered evidence exists about the extent and timing of employee hiring. The study by (Melillo et al. 2013) on Swedish ventures in knowledge-intensive industries (1994-2001) encompasses ventures of all sizes, including one-person ventures. It comes to the conclusion that 93% of ventures do not hire any employee during the first year of their existence. The remaining 7% of ventures involve one (5.3%), two (.89%), three (.4%) or 4 or more employees (.54%) during the same time span. Following Swedish ventures created in 1998 over the first 2 years of their existence, (Delmar & Shane 2003) report the following development of average employee number: At their inception, ventures hire an average employee capacity of .17 FTE, which increases over the following six months to .51 FTE. In month twelve, the average employee capacity hired further increases slowly to .73 FTE, before jumping up to 3.2 FTE in month 18. Interestingly, the average employee number hired then drops to 1.62 FTE in month 24, i.e. the last observation point. Finally, the findings of (Cooper et al. 1989) illustrate that US ventures which in the first year hire three employees or less grow more strongly during the remaining TFP, both in relative and absolute terms, than ventures that start out with more employees.

The existing evidence regarding the *involvement of external service providers* in team formation is even more scattered than for the hiring of employees, whereby scholars agree about the importance of service providers as an external source of labour: (Cassar & Ittner 2009) demonstrate that a large

number of new ventures in the US engage, or plan to engage, accountants (64%) and lawyers (46%) in their quest for profitability. At what point in the TFP the initial engaging of accountants occurs seems to strongly coincide with events like initial sale or opening of the ventures bank account. Furthermore, (Bennett et al. 1999) show that small and medium sized companies in the UK tend to make use of multiple external service providers and that the use of external service providers is positively related to the number of employees: The higher the number of employees, the more likely that a service providers is engage. (Cooper et al. 1989) come to the same conclusion in the US context.

While the existing studies provide valuable insights into TFPs and indicate that team formation in ventures is neither chaos nor unidimensional order, it remains unclear what and how many distinct approaches to TFP exist – and how they look like. Based on the available evidence on TFPs, we therefore expect that a limited number of distinct approaches to team formation exist. More specifically, we expect that:

**Proposition 1a:** *a limited number of systematically different approaches exist in which founders commit themselves to venture creation.*

**Proposition 1b:** *a limited number of systematically different approaches exist in which employees are hired during the venture creation process.*

**Proposition 1c:** *a limited number of systematically different approaches exist in which service providers are hired during the venture creation process.*

If we are right that team formation processes follow distinct pathways with regard to founder involvement, employees hiring, and the engagement of service providers, the question arises how these three channels relate to each other. **Does the way in which founders contribute to venture creation influence the extent and timing of employee hiring and service provider engagement?** And does the hiring of employees correlate with the engagement of service providers: For example, can we observe substitution effects with regard to the involvement of internal labour (employees) and external labour (service providers) throughout the TFP? Or are the approach to founder involvement, employee hiring and service provider engagement not related to each other?

While specific research into the relationship between founder, employee and service provider involvement during venture creation does not exist, different and often contradicting approaches to aggregate team formation have been described in the literature. On the one hand, studies describe high-growth ventures in which higher founder commitment co-occurs with extensive employee growth and service provider engagement (Reynolds & White 1997; Cooper et al. 1989). On the other hand, scholars observe substitution effects in ventures with growth aspirations between the hiring

employees and engaging service providers as ventures try to avoid high ancillary wage costs and employee protection (Román et al. 2011). Furthermore, ventures characterized by limited founder involvement and growth aspiration have been found to make use of service providers while refraining from hiring employees.

Given the contradictory evidence on the relationship between the involvement of founders, internal and external labour in venture creation, we expect that

**Proposition 2a:** *the time commitment of founders to venture creation is not related to the hiring approach of employees during the venture creation process.*

**Proposition 2b:** *the time commitment of founders to venture creation is not related to the engagement of service providers during the venture creation process.*

**Proposition 2c:** *the hiring approach of employees is not related to the engagement of service providers during the venture creation process.*

Should we be able to identify systematically different approaches to founder, employee, and service provider involvement during venture creation, the question arises how to explain which approach is chosen: Under which conditions do founders engage in one, rather than another, way when setting up their venture? And under which conditions do they hire no, some, or many employees and service providers respectively? In other words, **which influence does a venture's context and its characteristics have on the approaches chosen towards team formation?** A wide variety of VCP studies have pointed out, that part of the struggle to establish coherent patterns in VCP stems from the negligence of differences in the context and characteristics of the studied ventures (Gartner & Shaver 2012; Van de Ven & Engleman 2004; Ruef 2005). Among the most prominent factors identified in the entrepreneurship literature are: national institutions, a venture's innovation strategy and the type of product developed (Ruef 2005; Samuelsson & Davidsson 2009).

To begin with the influence of *national institutions* on venture creation processes – in our case the influence of labour-market institutions on team formation processes – the 'Varieties-of-Capitalism' (VoC) literature has long established that companies follow distinct human resource approaches as a reaction to different types of labor-market regulations (Hall & Soskice 2001; Estévez-Abe & Iversen 2001; Herrmann & Peine 2011). While these studies focus on incumbent firms, so that it remains unclear to what extent their findings can be extended to new ventures, different entrepreneurship studies highlight how specific aspects of national labor-market institutions may impact on team formation in new ventures.

With regard to *institutional influences on founder involvement*, real-options theory assumes that an individual will choose entrepreneurship over dependent employment if the potential rewards of

starting a venture outweigh the related risks (Wennberg et al. 2006). In regulated labor-markets, strong employment protection – e.g. in the form of strong unions, centralized wage bargaining, long notice periods and limited reasons for dismissal – makes dependent employment more attractive vis-à-vis entrepreneurship (Wennekers et al. 2005). At the same time, strong labor-market regulations also makes the hiring of employees more costly for entrepreneurs which, in turn, makes entrepreneurship less attractive (van Stel et al. 2007; Henrekson et al. 2010). Both effects imply that the level of certainty about a venture's profitability has to be higher in rigid labour-markets than in liberal ones for employees to give up their jobs in favour of entrepreneurship (Román et al. 2013). One way of increasing certainty about one's entrepreneurial abilities and the venture's profitability, without giving up the benefits of dependent employment, is part-time entrepreneurship (Raffiee & Feng 2014). Hence, part-time entrepreneurship seems more likely in regulated than in flexible labour markets.

With regard to *institutional influences on employee hiring*, rigid labor-market institutions reduce a venture's growth ambitions and the extent to which employees are hired (Bosma & Levie 2009; Baughn et al. 2010): Strong employment protection reduces the venture's flexibility to dismiss employees in response to changes in the business environment or in case of low employee performance. This, in turn, increases the risks of hiring employees (Henrekson et al. 2010; Davidsson & Henrekson 2002). (Bornhäll et al. 2016) point to similar effects in the Swedish case, where employment protection (such as limited reasons for dismissal and notice periods to be respected) become more severe once a venture employs a certain number of workers: Accordingly, the authors illustrate that the likelihood of hiring employees decreases significantly, once ventures come close to this threshold which, in turn, illustrates the negative influence of rigid labour-market institutions on employee hiring.

Similarly, *labour-market institutions* have been found to *influence the attractiveness of engaging external service providers* compared to employees. Based on a principal-agent model, (Parker 2010) illustrates that rigid labor-market institutions increase the tendency of firms to hire external service providers in order to circumvent employment constraints, such as payroll taxes. In line with these findings, (Román et al. 2011) show that rigid labor-market institutions encourage companies to hire their employees as self-employed service providers instead of extending their employment contracts. Given that employment protection becomes more severe once firms reach specific employee thresholds, and given that the consequences of hiring under-performing employees are more severe for small ventures than for large firms (Davidsson & Henrekson 2002), it can be expected that the preference of hiring service providers rather than employees is particularly acute in new ventures.

The above reasoning leads us to expect that

***Proposition 3a:*** *national labour market institutions influence the approach of founders towards committing themselves to venture creation.*

**Proposition 3b:** *national labour-market institutions influence the approach of entrepreneurs towards hiring employees during the venture creation process.*

**Proposition 3c:** *national labour-market institutions influence the approach of entrepreneurs towards engaging service providers during the venture creation process.*

Also the ***nature of the good (product or service)*** developed has been found to influence the number and type of gestation activities carried out – and thus the participation of founders and employees – during venture creation (Gordon & Davidsson 2013). On the one hand, ventures developing products require more resources than service developers (Ruef 2005); on the other, they are also more likely to pursue growth strategies due to their stronger need to achieve economies of scale (Audretsch et al. 2004). Consequently, a study of the Dutch hospitality sector finds that the growth patterns of small service ventures differ from those of small manufacturing ventures (Audretsch et al. 2004).

With regard to the *involvement of founders in venture creation*, (Petrova 2012) explains how the more limited need for resources and slow growth trajectories lead to significantly higher shares of part-time entrepreneurs running business service rather than manufacturing ventures. These findings are supported by Germany's self-employment statistics in 2008, where the share of part-time entrepreneurs amounted to 15% in manufacturing and 36.2% in service ventures (Buddensiek et al. 2013).

With regard to the *hiring of employees*, (Fritsch & Weyh 2006) illustrate that, on average, German manufacturing ventures do not only start out with more employees than their service providing counterparts; they also follow different growth trajectories during their first years of existence, so that the number of employees increases more substantially in product manufacturing than in service providing ventures.

The above reasoning leads us to expect that

**Proposition 4a:** *the nature of a good a venture intends to sell influences the approach of founders towards committing themselves to venture creation.*

**Proposition 4b:** *the nature of a good a venture intends to sell influences the approach of entrepreneurs towards hiring employees during the venture creation process.*

**Proposition 4c:** *the nature of a good a venture intends to sell influences the approach of entrepreneurs towards engaging service providers during the venture creation process.*

Finally, the ***innovativeness of a venture's business idea*** is also likely to influence the team formation approaches chosen. The innovation literature highlights that those ventures which develop new business ideas, rather than imitating existing ones, can either be radically or incrementally innovative.

While incremental innovators improve existing (technologies of) business ideas, radical innovators develop entirely new ones (Abernathy & Clark 1985). Depending on the type of innovation a venture develops, it faces different challenges (Samuelsson & Davidsson 2009; Amason et al. 2006). Ventures developing radical innovations mostly require tacit knowledge (Mascitelli 2000), because “*most knowledge is created and stored within individuals*” (Grant 1997). Therefore, the configuration of ventures’ internal labor resources, that is founders and employees, is especially relevant for innovative ventures (Andries & Czarnitzki 2014).

With regard to *founder involvement*, this implies that founders need to carry out more and a broader range of gestation activities (Amason et al. 2006; Samuelsson & Davidsson 2009) in order to master the higher levels of uncertainty and complexity related to radical innovations (Liao & Welsch 2008; Samuelsson & Davidsson 2009). Consequently, ventures developing radically innovative business ideas are more likely to be created by large founder teams, because they have more, and more diverse, resources at their disposal (Eisenhardt et al. 1990; Wiersema & Bantel 1992).

In line with this reasoning, ventures developing radical innovations also *hire employees* earlier and more substantially (Freel & Robson 2004). Given that the building up of tacit knowledge is both cost- and time-intense it only pays off for the venture if the employee is retained over a longer period of time (Virtanen et al. 2003; Becker 1962), hence can radically innovative ventures be expected to retain their employees for longer time periods than incrementally innovative ventures or imitators.

Contrary to that, innovative ventures *rely less on external service providers* than imitative ventures, because the latter are more willing to accept limited tacit knowledge in return for the increased flexibility to increase, or decrease, their pool of external service providers (Chandler et al. 2009).

The above reasoning leads us to expect that

***Proposition 5a:*** *the innovativeness of a venture’s business idea influences the approach of founders towards committing themselves to venture creation.*

***Proposition 5b:*** *the innovativeness of a venture’s business idea influences the approach of entrepreneurs towards hiring employees during the venture creation process.*

***Proposition 5c:*** *the innovativeness of a venture’s business idea influences the approach of entrepreneurs towards engaging service providers during the venture creation process.*

### 3. METHODOLOGY

#### 3.1. *The Data: Sample and Operationalization*

To test the aforementioned propositions, we use a subset of the “Perfect Timing” (PT) database. Based on computer-assisted telephone interviews with founders, this dataset was collected between 2012 and 2016 by an international research team located in Utrecht (The Netherlands), New York (US), Germany (Düsseldorf and Cologne), London (England), and Palermo (Italy). In order to capture possible variations in start-up processes, the population chosen includes start-ups of all legal forms (excluding sole proprietorship) that were registered between 2005 and 2011 in the information technology (IT) and alternative energy (AE) industries in Germany, and the US. Out of this population, start-up founders were selected at random and invited to participate in an interview about the start-up process of their company until a representative sample of 344 cases had been obtained.

The data’s explicit focus on the timing and sequencing of venture creation activities enables us to study patterns in TFPs. Importantly, the dataset is restricted to the duration of each venture’s respective TFP, defined as the time span between the first time a founder, employee or service provider actively worked on venture creation and the moment said venture generated sustainable profits (defined as 3 consecutive profitable months). If a new venture never made sustainable profits, three alternative TFP ends are considered, namely the acquisition, merger or liquidation of the respective venture. Had none of these events occurred, a TFP is categorized as ongoing until a maximum duration of 84 months. With regard to the team formation activities undertaken during the venture creation process, the dataset reports when each founder, employee, and external service provider started and, if applicable, stopped working for the new venture on a full-time or part-time basis.

To identify typologies of TFPs (dependent variable), we measure each venture’s *team formation activities* by determining how many founders, employees, and service providers are involved at each month of the venture creation process. To this end, we first calculate the amount of time, expressed in full-time equivalents (FTE), invested in venture creation by each of the venture’s founders. Second, we calculate the extent of employees hired (in FTEs) and, third, the number of service providers carrying out tasks for the new venture. For both the founder and employee dimension, we account for full-time as well as part-time arrangements (recorded as .5 FTE involvement). Our dataset thus details involvement from 0 FTE upwards in increments of .5 FTE. For service providers, we record the number of service providers, because part-time arrangements are difficult to measure for external labour. Because of the detailed nature of our month-by-month data, we consider only the first five founders, employees, and service providers contributing to venture creation, with the final 5.0 FTE also capturing involvement higher than 5.0 FTE. As such, the dimensions reporting founder and employee involvement each have 11 states (ranging from 0 FTE to 5.0 FTE), while they have 6 states

for contributions of service providers (ranging from 0 to 5 service providers). Table 1 provides an example of how these team formation activities are reported for a venture that achieved profitability after 11 months.

**Table 1** Example of Team Formation Process

Dimension (in FTE)	Month										
	1	2	3	4	5	6	7	8	9	10	11
Founder	.5	.5	2	2	2	2	4	4	4	4	4
Employee	0	0	0	.5	.5	1.5	1.5	1.5	1.5	1.5	1.5
Service Provider	1	1	0	0	0	0	0	1	2	2	2

We report the team formation activities for each of the 344 ventures included in our database. Table 2 provides some descriptive statistics of the TFPs of all ventures analysed, whereby the average TFP in the sample has a duration of 32.6 months. As Table 2 shows, TFPs are often small as the most common state for both the employee (67.1%) and service provider (46.1%) dimension is the involvement of 0 team members. For the founder dimension, the involvement of one founder at 1 FTE (33.4%) is the most likely state. The average founder involvement throughout the TFP is 1.5 FTE, in contrast to the much lower levels of employee involvement (.72 FTE) and service provider contribution (.95 SP).

**Table 2** Distribution of TFP states by dimension

Number of Team	Founder	Employees	Service provider
0	1.7%	67.1%	46.1%
.5	15.8%	4.0%	
1	33.4%	10.0%	26.7%
1.5	17.2%	2.9%	
2	12.3%	5.7%	17.2%
2.5	7.9%	.9%	
3	7.3%	3.1%	6.6%
3.5	1.5%	.6%	
4	2.1%	2.8%	3.1%
4.5	.1%	.1%	
5	.6%	2.8%	.4%

We measure the different *contextual factors (independent variables)* that may influence which TFP is pursued by a new venture as follows. The impact of *labour market rigidity* or, respectively, flexibility is measured by the country in which a venture is located, namely in Germany (coded 0), representing a particularly typical example of a rigid labour market, or in the US (coded 1), offering one of the most flexible labour markets.

The *innovativeness* of a venture's business idea is determined in a three-step process. In the first step, the founder was asked whether his business develops a radically new, incrementally new, or imitative product or service.<sup>1</sup> In a second step, the interviewer – upon completion of the interview – cross-checked the founder's answer by comparing the venture's innovativeness with the innovativeness of the other ventures about which s/he had conducted interviews. In a third step, the person cleaning the data, again, cross-checked the degree of innovativeness indicated against the classification scheme he had developed while cleaning the data. In both step two and step three, the interviewer and the data cleaner relied on the information provided by the founder as well as on online information about the venture's business idea. This three-step process made it possible to minimize the over-estimation bias that typically occurs when founders self-report the level of innovativeness of their business idea. The degree of innovativeness was measured as whether the venture's business idea is an imitation (0), improvement (1), or radical innovation (2).

The same three-step process was used to determine whether the new venture develops a product, a service, or a business idea that combines elements of product and service. Given that the number of ventures that only develop products is fairly limited (22.4%) , we code the *nature of good developed* as a dichotomous variable, distinguishing between pure service ventures (0) and those ventures that either offer products or services and products (1).

Furthermore, the following *control variables* are included: Possible *industry differences* in TFPs are controlled by assessing whether the venture is active in the ICT industry (0) or the alternative energy industry (1). It is also assessed whether a venture started independently (0) or as a *spin-off* (1), and whether a venture was registered in a year of well-being (0) or *economic crisis* (1).

**Table 3** Descriptive Statistics of Independent and Control Variables

	N	Mean	Std. Dev.	Correlation Coefficient				
				1	2	3	4	5
Control variables								
1 Industry <sup>a</sup>	344	.29	.453					
2 Spin-off <sup>a</sup>	344	.09	.291	-.071				
3 Crisis <sup>a</sup>	344	.41	.493	-.034	-.023			
Independent variables								
4 Labour Market <sup>a</sup>	344	.4	.491	-.131**	-.121**	.036		
5 Innovativeness <sup>b</sup>	344	.64	.646	-.211***	.089*	-.063	.038	
6 Nature of Good <sup>a</sup>	344	.49	.501	.078	.064	-.114**	-.245***	.239***

<sup>a</sup> Pearson's r. <sup>b</sup> Spearman's rho. *p*-values \*\*\* < .01, \*\* < .05, \* < .1.

<sup>1</sup> Concrete question asked in the questionnaire: 'How would you describe the degree of novelty of venture's product/s?'

Table 3 provides some descriptive statistics about the independent variables used in the below logistic regression analyses. Furthermore, we tested for multicollinearity but no variance inflation factor value exceeded 1.2, hence multicollinearity does not appear to be a problem.

### **3.2. Analyses**

In line with our theoretical illustrations, we run three different types of analyses: **(1)** In a first step, we assess whether a limited number of systematically different TFPs approaches exist to founder involvement, employee hiring, and service provider engagement (*Propositions 1a – 1c*) and illustrate how they look like. To this end, we use optimal matching (OM) techniques combined with cluster analyses, whereby each of the three TFP channels (founder, employee, and service provider involvement) constitute the respective units of analysis. The OM algorithm measures the distance between processes. If subsequently paired with cluster analyses, such sequence analyses allow us to explore and interpret patterns in longitudinal data (Halpin 2010).

Thus far, OM has mostly been used in sociology to explore career patterns (Abbott & Hrycak 1990; Stovel & Bearman 1996; Blair-loy 1999; Pollock 2007; Biemann et al. 2012). Only recently, (Gordon 2012) applied OM techniques to explore gestation activities in venture creation processes. Given that more wide-ranging developments and applications of OM algorithms only occurred after the year 2000, OM is still a fairly young method. Nevertheless, a standard way of running sequence analyses, based on OM techniques, has crystallized, which we here follow (Biemann & Datta 2014). It includes four steps:

#### *Step 1: Coding the Data*

The first step consists in reporting the team formation process of each venture on a monthly basis. More concretely, this means that a sequence of states needs to be created for each of the three dimensions (founder, employee, service provider involvement) of the TFP of each venture. As outlined above, this process can vary in length for each venture, because it reports the (founder, employee, service provider) state for each month of the venture's TFP – in FTE for founder and employee involvement and in absolute numbers for service providers (see Table 1).

#### *Step 2: Define the Substitution Costs*

In order to measure the distance between two TFP sequences, created in Step 1, a cost needs to be assigned for replacing one state by any other state with the aim of transforming one sequence into the other. These so-called substitution costs range from 0 to an arbitrary maximum (here: 2) and are often estimated on the basis of the frequency of transitions between two states within the entire dataset. In our case, the sequence states represent equally-sized steps along a continuous scales, so we can directly calculate the substitution costs as a linear interpolation between the minimum substitution cost

for equal states (0) and the maximum substitution cost (2) for the most distant states, as given by the number of FTEs difference between the two states.

### *Step 3: Calculating Sequence Similarity*

Based on these substitution costs, we then calculate – for each of the 344 sequences in our dataset – how costly it is to transform this sequence into any other (of the remaining 343) sequence(s). We do this separately for each of the three dimensions. The cost of transforming one sequence into the other expresses their respective distance. To calculate the similarity for sequences that differ in length, we calculate their similarity based on shorter of the two lengths. This corresponds to the intuition that a venture's TFP beyond the period observed in the study is unknown (e.g. because it was acquired) and thus should not influence its similarity estimates. We normalize the similarities by dividing them by the length of the sequences to maintain a common scale among the similarity measures. This results in three matrices (one for founder, employee, and service provider involvement respectively) that detail the distances between each sequence pair.

### *Step 4: Perform a Cluster Analysis*

In the concluding step, we cluster the founder, employee, and service provider dimensions of TFPs on the basis of their respective similarities. Consequently, all clusters obtained for each dimension encompass those processes that are particularly similar to each other, and distant to the processes of other clusters, so that each cluster represents a distinct approach to founder, employee, or service provider involvement during TFPs. To determine the optimum number of clusters, we use a combination of various partition quality measurements, namely the Weighted Average Silhouette Width (ASWw),  $R^2$ , Point Biserial Correlation (PBC) and Hubert's C (HC).

(2) In the second step, we run correlation analyses in order to understand whether there are systematic relationships between the extents to which founders, internal labour (employees) and external labour (service providers) are involved in venture creation (*Propositions 2a – 2c*). Since the expected cell count in our contingency tables is low ( $< 5$ ) for a large number of cluster-combinations (56% of the cells), we use Fisher's exact test to examine the statistical significance of our results.

(3) In the third step, we use one-versus-rest logistic regression models to identify the conditions that influence the TFP approaches taken towards founder, employee, and service provider involvement (dependent variable) during the TFP. Testing *Propositions 3a – 5c*, we determine the explanatory power of labour market flexibility, the innovativeness, as well as the nature of the good developed by the new venture (independent variables), whereby we control for the venture's industry, year of registration, independence during start-up (control variables).

We fit the following model for each cluster to obtain our estimates:

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 LabourMarket_i + \beta_2 Innovativeness_i + \beta_3 NatureOfGoods_i + \boldsymbol{\beta}' \mathbf{x}_i \quad (1)$$

where  $p_i$  denotes the probability that venture  $i$  belongs to the cluster rather than to any of the other clusters,  $\beta_0$  the cluster's intercept,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  the estimated coefficients for our independent variables,  $\boldsymbol{\beta}$  a vector of coefficients for the control variables, and  $\mathbf{x}_i$  a vector of control variables.

## 4. RESULTS

### 4.1 Patterns in Team Formation Processes

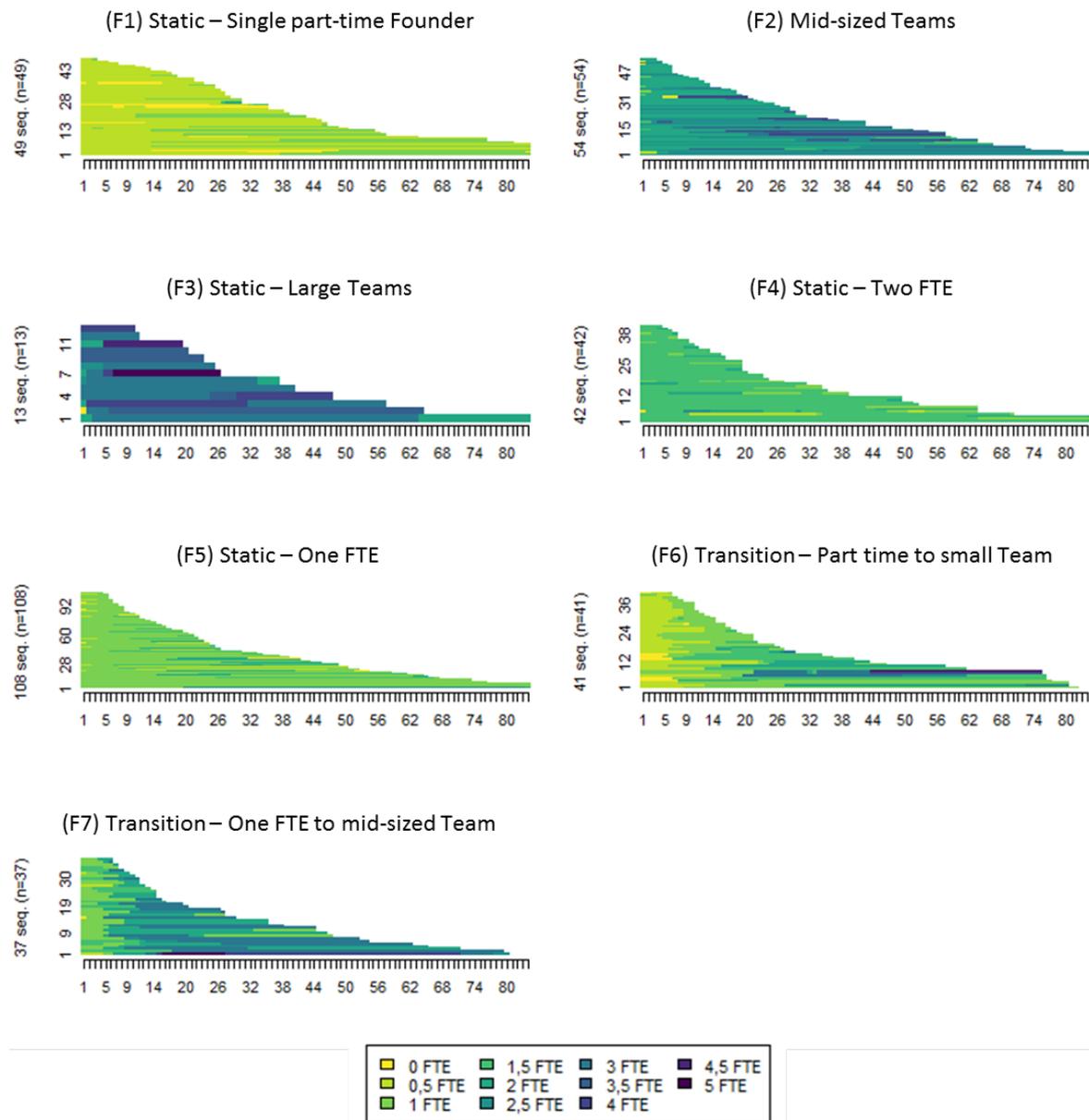
The partition quality measurements identify the 7 cluster solution as the optimal clustering solution for the *founder dimension* (ASWw .46 /  $R^2$  .68 / PBC .44 / HC .06). Every cluster of these 7 clusters reveals a distinct approach to founder time commitment in the TFP. Hence we can conclude, that *Proposition 1a* holds, a limited number of systematically different approaches to founder time commitment exist.

The 7 clusters we identify for the founder dimension are relatively homogenous in size with two exceptions. The fifth founder cluster (F5) is the most sizeable cluster at 108 ventures. In turn F3 is relatively small ( $n = 13$ ) while the remaining cluster contain between 37 and 54 ventures.

F1 is the third largest cluster ( $n = 49$ ) and features ventures with a low time commitment of a single part-time founder. Hence, for most of the TFP, founder involvement is .5 FTE in this cluster. While a minority of ventures goes through intermittent periods of inactivity or an increase to 1 FTE, this is a largely static approach. F4 and F5 exhibit similarly static processes in which the founders invested 1.5 FTE, respectively 1 FTE for much of the process, with a few exceptions scaling up or down towards the end of the process. Ventures grouped together in F3 don't display a clear transition pattern either, but start out with larger founder team (3 FTE) than those in any other cluster.

Other approaches taken to founder involvement are far more dynamic. The second cluster, F2, consists of ventures that start out with a mid-sized team of 2 or 2.5 FTE. Most ventures, especially those with longer TFPs subsequently increase the founder involvement to up to 4 FTE. The sequences is F6 and F7, are characterized by a clear transition pattern. Ventures in F6 begin the process with a founder involvement of .5 FTE and tend to scale up to 1 or more FTE after about 9 months. Their counterparts in F7 begin at 1 FTE, before choosing to increase founder commitment after about 7 months, eventually settling on 2 to 3 FTE of founder involvement.

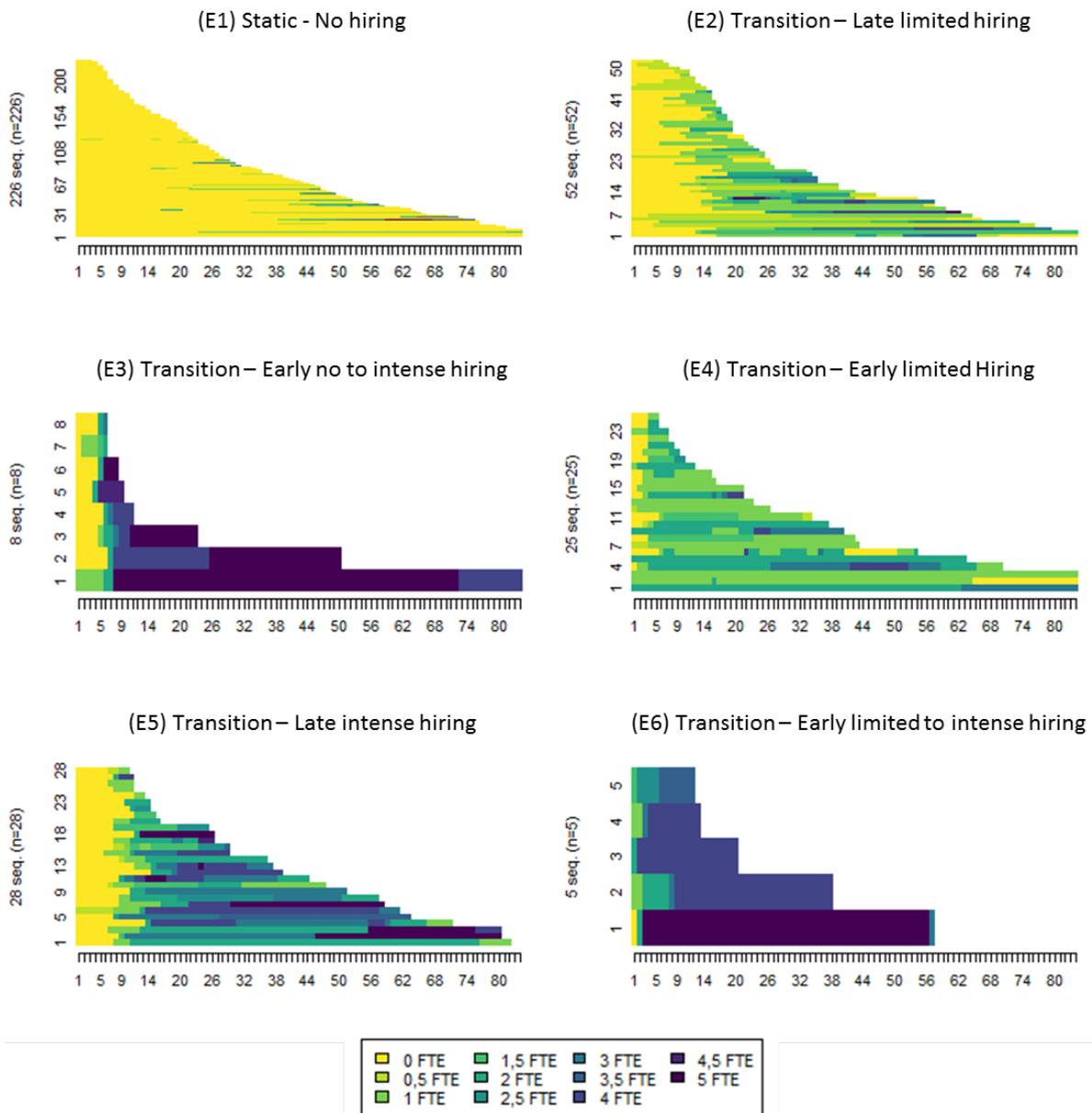
**Figure 1:** Distinct approaches to founder involvement



With regard to the clustering of the approaches taken to *employee hiring* the partition quality measurements indicate that a 6 cluster solution is the best solution (ASWw .64 / R<sup>2</sup> .63 / PBC .55 / HC .06). Each of these 6 clusters represents a distinct approach to employee hiring. As a result we can conclude that *Proposition 1b*, which propose that a limited number of systematically different approaches exist in which employees are hired during the venture creation process, holds.

The distribution over the 6 approaches found for employee hiring is heavily skewed and less homogenous than that of the founder dimension. By far the largest group of ventures (n = 226) is found in employee cluster E1, a cluster characterized by the absence of employees. Compared to this passive and static approach to hiring employee the rest of the clusters are more dynamic and are characterized by transition patterns and different levels of employee hiring. They range from 5 to 52 ventures in size.

**Figure 2:** Distinct approaches to employee hiring



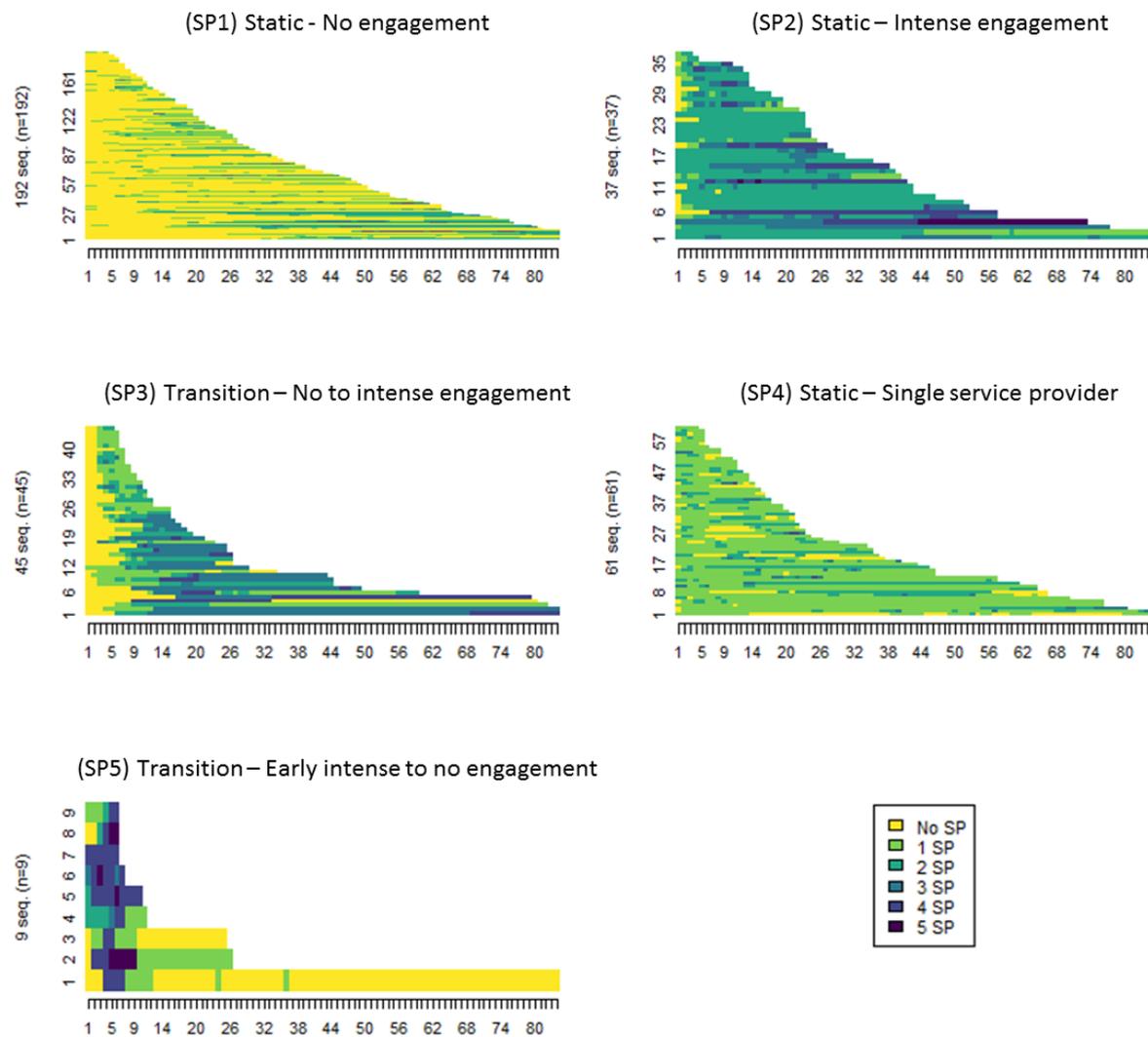
E3 and E4 both depict an approach in which the venture begins without an employee but starts hiring in the first 6 months of the TFP. The difference between these two clusters is the extent of hiring. Whereas ventures in E3 hire up to 5 FTE, their counterparts in E4 transition from no employee to 1 or 2 FTE after 6 months. Similar dynamic transitions can be observed in E5 and E2. While the transition from no to 2-3 FTE in E5 happens after around 9 months, ventures in E2 hire to a lesser extent (around 1 FTE) and do so mostly 12 months into the FTP or even later.

E2 and E4 both depict an approach in which the ventures begin without an employee but eventually hire employees to the capacity of 1 FTE. The difference between the two clusters is the timing of the

transition. In E4, this transition takes place within the first 6 months, while this typically takes more than 12 months for those in E2. We observe a much stronger and more immediate employee involvement E6. Although very few ventures ( $n = 5$ ) follow this approach it is that these ventures start with 1-2 FTE and quickly expand the number of employees to up to 5 FTE.

The partition quality measurements identify the 5 cluster solution as the optimal solution for the approaches taken to the *engaging of service providers* (ASWw .43 /  $R^2$  .48 / PBC .57 / HC .08). Again each cluster reveals a distinct approach to this dimension of the TFP. Hence we are able to identify 5 distinct approaches to engaging of service providers and can conclude that *Proposition 1c* proposing that a limited number of systematically different approaches exist in which service providers are hired during the venture creation process, holds.

**Figure 3:** Distinct approaches to service provider engagement



The 5 clusters identified in the service provider dimension are similarly heterogeneous in size as those of the employee dimension. In parallel to the employee dimension, the largest cluster (SP1) is dominated by inactivity. With a size of 192 ventures it is more than 3 times as big as the second largest cluster SP2 (n = 61).

In contrast to SP1, SP2 features ventures that typically involve 2 service providers. In most cases, these service providers were engaged immediately at the start of the TFP. While some ventures eventually hire more than 2 service providers, the cluster contains mostly static sequences. In SP3 we find ventures that rely similarly heavily on external service providers, but mostly started hiring them after about 6 months into the TFP. SP4 includes ventures that hire one service provider early on and sustain or repeat collaboration with this service provider for the remainder of TFP. The last cluster, SP5, is small, and is characterized by immediate and intense collaboration with external providers. However, this collaboration is very brief, either because the venture creation is quickly completed or because service providers are not retained for the remainder of the TFP.

#### 4.2 Correlations between Founder, Employee, and Service Provider Involvement

In line with the expectations of *Propositions 2a-2c*, we find only weak, if any, correlations between the approaches towards founder, employee, and service provider involvement during the venture creation. Fisher's exact test reveals that there is no significant correlation between the founder and service provider approaches taken. While a significant correlation exists between the approaches taken towards employee hiring and founder involvement on the one hand, and service provider engagement on the other, the low Cramer's V values (.19 and .15 respectively) reveal that the observed correlations are only weak ones. As a result we can conclude that *Proposition 2b* holds that there is not clear correlation between the approaches to founder and service provider involvement. In order to investigate *Proposition 2a* and *2c* a more detailed analysis of the underlying correlations is required and follows with the help of pair-wise cross-tabulations of the clusters of the dimension pairs.

**Table 4** Correlation between TFP dimension

Dimensions	Fisher's Exact Test	Cramer's V
Founder x Employee	50,684***	.194
Founder x Service Provider	27,125	.137
Employee x Service Provider	26,685*	.149

*p*-values \*\*\* < .01, \*\* < .05, \* < .1.

The cross-tabulations of the cluster pairs of the founder and employee dimension demonstrate that the observed correlation stems from a very limited number of cluster pairs that co-occur particularly often (Table 5). E1 including ventures which never hire an employee has a strong overlap with F1

consisting mostly of single part-time founders. Ventures combining these approaches can be described as risk avoiding solo part-time founders without noticeable growth ambition. In contrast, ventures growing to larger founder teams over time (F7) are underrepresented in said E1, indicating that founder teams committing substantial amounts of their own time are not content with ventures without growth ambitions. The combination of F4 (constant 1 FTE) and E2 (hiring begins after 12 month) occurs particularly often and is indicative of a slow growth process driven by a single full-time founder or a duo of two part-time founders. The growth occurs through employee hiring after the founder(s) have learned more about the profitability of the venture and thus have mitigated the risk of hiring employees in face of unclear prospects.

Another interesting observation is that ventures in the two clear transition clusters F6 (single part-time founder to single full-time or small founder team) and F7 (1FTE to large founder team) are associated with the transition cluster E5 (late but intense hiring of employees). This is noteworthy because the transitions in these clusters happen between 6 and 9 months into the TFP, this is arguably an indication these ventures go through a phase of business development (for example, prototyping or customer acquisition) before starting the commercial operation as part of a clear growth process.

Between these correlations we can see that rather than being substitutes for each other, founder and employee capacity seem to grow in parallel to each other. However, this effect is limited to a few cluster pair combination, meaning we overall conclude that *Proposition 2a* holds and no overall relation between the founder and employee dimension of the TFP exists.

We find a similarly limited overlap between cluster pairs of the employee and service provider dimension (Table 6).

**Table 5** Overlap between founder and employee clusters

Founder cluster	Employee cluster					
	E1	E2	E3	E4	E5	E6
F1	<b>79.6%</b>	18.4%	*	*	*	*
F2	70.4%	18.5%	*	*	*	*
F3	53.8%	*	*	*	*	*
F4	57.1%	<b>26.2%</b>	*	*	*	*
F5	65.7%	11.1%	*	13.9%	5.6%	*
F6	68.3%	<b>9.8%</b>	*	*	<b>14.6%</b>	*
F7	<b>51.4%</b>	16.2%	*	*	<b>21.6%</b>	*
Column total	<b>65.7%</b>	<b>15.1%</b>	<b>2.3%</b>	<b>7.3%</b>	<b>8.1%</b>	<b>1.5%</b>

\* = < 5 expected observations. Values indicate percentage of the row cluster that is in the column cluster.

Ventures in E2 (hiring begins after 12 months or later) are less likely to be associated with service provider cluster SP1 (no service providers), but more likely to co-occur with service provider cluster SP3 (late but intense service provider engagement) than ventures taking other approaches to employee hiring. These combinations indicate that ventures growing slow and late would rather supplement the internal growth with external growth for cautious growth strategy than no additional growth.

Ventures hiring multiple employees at a comparatively late stage (employee cluster E5) tend to make early and continuous use of one external service provider (SP4). This characterizes a slow risk approach which in the beginning hires external services providers when needed and pursue more extensive growth with help of employees once the founders know more about the profitability of the ventures.

**Table 6** Overlap between employee and service provider clusters

Employee cluster	Service provider cluster				
	SP1	SP2	SP3	SP4	SP5
E1	60.6%	11.1%	9.7%	15.9%	2.7%
E2	<b>44.2%</b>	11.5%	<b>21.2%</b>	21.2%	*
E3	*	*	*	*	*
E4	56%	*	*	*	*
E5	50%	*	*	<b>25%</b>	*
E6	*	*	*	20%	*
Column total	<b>55.8%</b>	<b>10.8%</b>	<b>13.1%</b>	<b>17.7%</b>	<b>2.6%</b>

\* = < 5 expected observations. Values indicate percentage of the row cluster that is in the

While these examples prove that some approaches to employee and service provider involvement are more likely to co-occur, the vast majority of approach combinations seem to occur independent of each other. Hence, we can conclude, that for the overall sample no coherent correlation between these two approaches can be observed, meaning *Proposition 2c* largely holds.

### **4.3 Determinants of Approaches towards Founder, Employee, and Service Provider Involvement**

Having found systematically different approaches to founder, employee, and service provider involvement in team formation, what are the drivers of each approach? In other words, under which conditions do founders contribute to venture creation in one rather than another way? While most of the *founder approaches* (namely clusters F2, F4, F5, and F6) do not differ as a function of the structural factors mentioned in the literature,<sup>2</sup> part-time entrepreneurship (cluster F1) is more likely in product developing ventures, while it is less likely if ventures develop a radically and incrementally

<sup>2</sup> Notably, the R<sup>2</sup>s of these four clusters are low, which indicates that relevant factors are missing in our model for these approaches.

innovative business idea. Finding an association between ventures developing products and part-time entrepreneurship (Exp  $\beta = 1.895$ ;  $p < .1$ ) might be surprising at first glance and contradicts the reasoning underlying *Proposition 4a*. Yet, when looking at the cases in founder cluster F1, part-time entrepreneurship can be explained by a high number of software engineers working on simple software products (apps), as well as farmers running alternative energy ventures in part-time next to their main business. Contrary to that, it is less surprising that innovative ventures are less often run by one part-time entrepreneur. As suggested by *Proposition 5a*, imitative ventures do not require a high time commitment from their founders.

**Table 7** Regression estimates for founder clusters<sup>1)</sup>

Variable	Founder cluster (Exp $\beta$ )					
	F1	F2	F4	F5	F6	F7
Nature of Good	1.895*	.914	.91	.695	.824	1.286
Innovativeness Incremental	.341**	1.314	.961	.964	.984	3.014**
Innovativeness Radical	.293**	1.199	.736	1.75	1.5	1.447
Labour Market	1.518	.996	.775	1.223	1.197	.352**
Industry	.594	1.393	.95	1.449	1.579	.402*
Spin-off	.985	.757	1.003	.931	1.175	1.117
Crisis	1.441	1.316	1.084	.75	.894	.922
Intercept	.165***	.139***	.165***	.487***	.118***	.094***
Obs.	49	54	42	108	41	37
R <sup>2</sup>	.073	.012	.005	.031	.015	.128

*p*-values \*\*\* < .01, \*\* < .05, \* < .1.

1) Cluster F3 not included, because number of cases too limited for meaningful regression results

The only other founder approach that is significantly associated with several structural factors is the transition process from 1 FTE to 2 or more FTE (cluster F7). Founders pursuing this approach are more likely to work for incrementally innovative, but not or radically innovative ventures (Exp  $\beta = 3.014$ ;  $p < .1$ ), lending only partial support to *Proposition 5a*. Yet, in line with our reasoning of *Proposition 3a*, founders transitioning from low to higher time commitments are more likely to be found in regulated rather than deregulated labour markets (Exp  $\beta = .352$ ;  $p < .05$ ). Finally, founders in cluster F7 are also more likely to be active in ICT rather than AE industries.

With regard to the drivers of the approach chosen towards *employee hiring*, it is first interesting – and rather unsurprising – to note that the hiring of no employees (cluster E1) occurs less frequently in incrementally innovative ventures (Exp  $\beta = .646$ ,  $p < .1$ ). This, in turn, lends support to the reasoning of *Proposition 5b*. Also spin-offs are markedly less likely *not* to hire any employees (Exp  $\beta = .386$ ;  $p < .05$ ), but rather hire at least one employee about twelve months after the start of venture creation (cluster E2; Exp  $\beta = 2.14$ ;  $p < .1$ ). Also alternative energy ventures are significantly more likely to

hire at least one employee twelve months after venture begin (E2; Exp  $\beta = 2.517$ ;  $p < .05$ ). This can be explained by the long time it takes to obtain all required permits, which implies that employees in AE ventures are hired relatively late in the TFP.

As suggested by the reasoning underlying *Proposition 4b*, ventures developing products require more resources and need longer time to assemble these resources. The finding that product developers tend to hire rather late but intensely (cluster E5) thus supports *Proposition 4b* (Exp  $\beta = 2.222$ ;  $p < .1$ ). Finally, we do not find any evidence in support of the idea, expressed in the reasoning of *Proposition 3b*, that regulated labour-market institutions hamper the hiring of employees.

**Table 8** Regression estimates for employee clusters<sup>1)</sup>

Variable	Employee cluster (Exp $\beta$ )			
	E1	E2	E4	E5
Nature of Good	.881	.963	.482	2.222*
Innovativeness Incremental	.646*	1.506	1.107	1.371
Innovativeness Radical	1.160	.443	1.772	1.059
Labour Market	1.255	.698	1.156	.948
Industry	.698	2.517**	1.245	.520
Spin-off	.386**	2.14*	.412	1.428
Crisis	1.318	1.177	.394*	.854
Intercept	2.486***	.111***	.122***	.057***
Obs.	226	52	25	28
R <sup>2</sup>	.063	.075	.057	.052

*p*-values \*\*\* < .01, \*\* < .05, \* < .1.

1) Clusters E3 and E6 not included, because number of cases too limited for meaningful regression results

Regarding the *engagement of service providers* we observe several significant conditions in which ventures are particularly likely not to engage any service providers (SP1). As outlined in, and in support of, the theoretical illustrations leading to *Proposition 3c*, rigid labour-market institutions are likely to stimulate the use of external service providers (Exp  $\beta = 2.081$ ;  $p < .05$ ). Furthermore, we find that product developing ventures are more likely not to hire service providers (Exp  $\beta = 1.617$ ;  $p < .05$ ). Given the literature's argument that product developers invest and scale up more than service developers, this finding – together with the above finding on employee hiring – can be interpreted to the extent that product developing ventures prefer the stability of hiring employees over the flexibility of engaging service providers. This supports *Proposition 4c* that the nature of the produced influences the approach to engaging service providers.

Interestingly, we observe the opposite associations with cluster SP3, which means that ventures in rigid labour markets (Exp  $\beta = .532$ ;  $p < .1$ ) as well as ventures developing services (Exp  $\beta = .495$ ;  $p < .1$ )

.05) are more likely to substantially hire service providers about 6 months into the TFP. This lends additional support to the reasoning underlying *Proposition 3c* and *Proposition 4c*.

No support is found for the reasoning underlying *Proposition 5c*, which suggests that the innovativeness of a venture's business influences the extent of service provider engagement. However, we find evidence that ICT ventures are likely to not hire any service providers (SP1: Exp  $\beta$  = .553;  $p < .05$ ) but highly unlikely to intensely engage service provider (SP2; Exp  $\beta$  = 2.964;  $p < .05$ ). We therefore conclude that, depending on their industry, ventures take significantly different approaches towards hiring service providers.

**Table 9** Regression estimates for service provider clusters<sup>1)</sup>

Variable	Service provider cluster (Exp $\beta$ )			
	SP1	SP2	SP3	SP4
Nature of Good	1.617**	1.166	.495**	.892
Innovativeness Incremental	.823	1.134	1.312	1.113
Innovativeness Radical	.653	.952	1.401	1.531
Labour Market	2.081**	.714	.532*	.662
Industry	.553**	2.964**	1.039	1.343
Spin-off	.952	1.300	1.133	.795
Crisis	1.375	.940	.659	.860
Intercept	.893	.078***	.255***	.24***
Obs.	192	37	45	61
R <sup>2</sup>	.073	.064	.04	.018

*p*-values \*\*\* < .01, \*\* < .05, \* < .1.

1) Cluster SP5 not included, because number of cases too limited for meaningful regression results

## 5. CONCLUSIONS

What have we learned about possible approaches to team formation during venture creation – and their drivers? Most importantly, our analyses lend support to the underlying assumption of both the stage-based (Levie & Lichtenstein 2010) and the activity-based literatures (Liao et al. 2005; Gartner & Shaver 2012) that team formation processes are ‘order, not chaos’. Yet, in contrast to the stage-based literature, we did not find one best way of organizing team formation during venture creation. Instead, we identified seven distinct ways in which founders contribute to venture creation (ranging from part-time entrepreneurship to strongly growing founder teams), six different approaches towards hiring employees (ranging from no hiring to the immediate hiring of numerous employees), and five distinct ways of engaging service providers (also ranging from the engagement of no service providers to a high number thereof). Most importantly, these approaches differ from each other in the extent to which they are static or, respectively, dynamic: While static approaches are characterized by a stable number of founders, employees, or service providers contributing to venture creation, their

number varies throughout the venture creation process in dynamic clusters – whereby it is interesting to note that, with one exception, all dynamic approaches are characterized by an increase, rather than a decrease, in team size.

Interestingly, the approaches taken towards founder, employee, and service provider involvement during venture creation, overall, hardly correlate with each other. In other words, the extent to which founders engage in venture creation on the one hand, and hire employees and service providers on the other, is in most cases independent of each other. In some few instances, we observed exceptions: With regard to *founder and employee* involvement, we observed additionality effects, meaning that founders who only engage part-time in venture creation often also abstain from hiring any employees. Similarly, ventures whose founder team grow slowly over the start-up process also slowly increase their employee base by about 1 employee over time. The same holds for high-growth ventures that are characterized by both substantially increasing founder and employee teams. Interestingly, such additionality effects could only be observed for internal labour resources, i.e. between founder and employee involvement. Systematic correlations between *founder and service provider* approaches could not be observed. Finally, we found some occasional substitution effects in the extents to which *employees and service providers* are engaged in venture creation as ventures tend to rely on service providers in those moments where hardly any employees are hired – and vice-versa.

Finally, we showed that several structural conditions influence which approach is taken towards founder involvement, employee hiring and service provider engagement. Accordingly, we saw that the nature of the good developed (product or service) often influences team formation approaches, while labour-market institutions and the innovativeness of a venture's business idea partly impacts on team formation processes: Contrary to service developers, product developing ventures are characterized by part-time founders, the late but intense hiring of employees, and the early and intense hiring of service providers. Furthermore, the team formation processes of incrementally innovative ventures are hardly characterized by part-time founders but rather by rather by slowly increasing founder teams and the systematic hiring of employees. Finally, rigid labour-market institutions imply that ventures grow their founder team rather slowly, do not impact on the approach taken towards employees hiring, but make that ventures substantially rely on external service providers to get the work done.

What do these findings imply for entrepreneurship policies? Given that we found team formation processes to be order, not chaos, meaning that they evolve along several distinct trajectories, entrepreneurship policies will influence venture creation processes by changing their structural conditions. Policies that influence the extent to which ventures develop new products rather than services, the extent to which they are innovators rather than imitators, and the extent to which they operate in rigid rather than in flexible labour markets will all change the team formation processes

chosen by ventures. Importantly, though, such changes do not imply better, more, or more sustainable forms of entrepreneurship. They rather imply that ventures will prefer one trajectory over others when building up their human resources. While such equifinality might be disappointing at first glance, it is in our view preferable to foster entrepreneurial variety as this enable competition through different rather than the same approach.

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