Entrepreneurs' decisions. Venture creation, high-growth entrepreneurs, and founding team evolution

Bing Song

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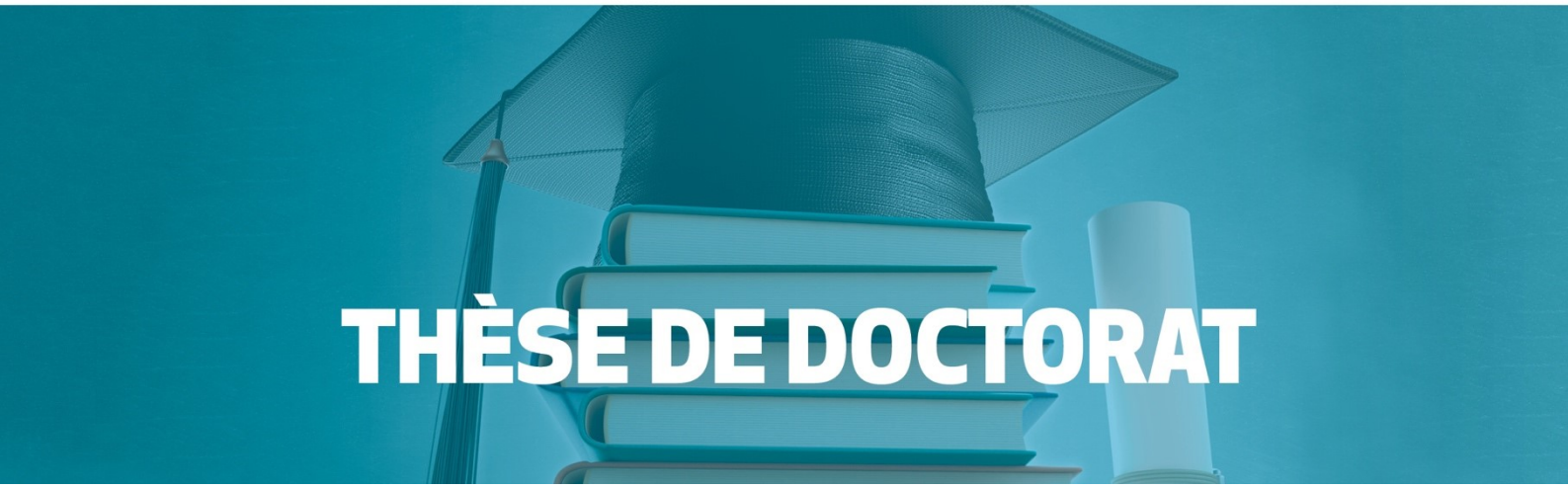

Décisions des entrepreneurs

Création d'entreprise, entrepreneuriat à fort développement et évolution de l'équipe fondatrice

Bing SONG

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Dirigée par : Armin SCHWIENBACHER

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Devant le jury, composé de :

Fabio BERTONI, Professor en Finance, SKEMA Business School

Douglas CUMMING, Professor en Finance and Entrepreneurship, Florida Atlantic University

Sophie MANIGART, Professor en Corporate Finance, Ghent University

Armin SCHWIENBACHER, Professor en Finance, SKEMA Business School

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Jury:

Président du jury

Fabio BERTONI, Professor in Finance, SKEMA Business School, France

Rapporteurs

Douglas CUMMING, Professor of Finance and Entrepreneuriat, Florida Atlantic University, États-Unis

Sophie MANIGART, Professor in Corporate Finance, Ghent University, Belgique

Examinateur

Fabio BERTONI, Professor in Finance, SKEMA Business School, France

Armin SCHWIENBACHER, Professor in Finance, SKEMA Business School, France

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Résumé

Les entrepreneurs contribuent de manière significative aux activités économiques et à la création d'emplois. S'engager dans des activités entrepreneuriales exige que les entrepreneurs s'exposent à la forte probabilité d'échec, à des risques et à l'incertitude. Par conséquent, il est crucial de comprendre et d'identifier les facteurs qui contribuent à la création d'entreprise, à la poursuite de leurs activités et au développement des activités des entrepreneurs. Cette étude explore 1) un nouveau facteur qui détermine différents niveaux de la tendance à entreprendre à travers les pays et les cultures, et 2) la façon dont les entrepreneurs et les équipes entrepreneuriales choisissent leurs voies de développement et d'évolution.

Le chapitre 1 illustre et utilise de manière inédite une caractéristique linguistique du temps futur, la morphologie flexionnelle (c'est à dire conjugaison) pour le temps futur (IF), afin de mesurer la perception de l'incertitude, et d'explorer son effet sur la tendance à entreprendre d'un pays. L'utilisation de la morphologie flexionnelle pour le futur est censée inciter les locuteurs à percevoir intensément l'incertitude. Par conséquent, ces pays et régions connaissent moins de nouvelles entreprises créées. Les preuves empiriques appuient la proposition en utilisant les données au niveau des pays dans 137 pays de 2010 à 2018. Les résultats impliquent que la caractéristique linguistique du futur peut servir comme un facteur institutionnel de la perception de l'incertitude par un individu et contribuer à l'hétérogénéité de la tendance à entreprendre nationale et régionale.

Le chapitre 2 examine si la composition de l'équipe fondatrice des entrepreneurs novices aide à prédire s'ils deviennent des entrepreneurs à fort développement. Contrairement aux recherches précédentes, cette étude prend le point de vue de l'entrepreneur en suivant l'activité entrepreneuriale de 1000 entrepreneurs novices au cours de leurs dix premières années. Les résultats montrent que la composition de l'équipe de l'entreprise initiale est importante pour la probabilité que les entrepreneurs connaissent au final un statut de fort développement. Les résultats montrent en outre que les membres non familiaux qui participent en tant que partenaires commerciaux à la toute première entreprise des entrepreneurs les aident à réentreprendre. De plus, les entrepreneurs à fort développement sont plus souvent des entrepreneurs habituels. Lors de l'analyse au niveau de l'entreprise, différents résultats apparaissent, ce qui souligne la nécessité de bien choisir le niveau d'analyse lors de la comparaison des résultats de l'activité entrepreneuriale.

Le chapitre 3 évalue l'évolution des équipes fondatrices entrepreneuriales. Les équipes sont des facteurs clés du succès des nouvelles entreprises, mais ils ne sont pas statiques dans le temps. Dans ce chapitre, la chronologie des changements des équipes est mise en évidence et démontrée pour faire des conséquences différentes. Cette enquête a été menée en suivant 1000 équipes britanniques au cours des dix premières années de leurs activités. Selon la chronologie du départ du fondateur et de l'entrée de nouveaux membres, l'éviction du fondateur et le remplacement sont deux types d'évolution nouvellement définis. Les résultats révèlent différents facteurs (propriété au capital, opportunité entrepreneuriale alternative et la disparité de la répartition de la propriété) pour le départ et l'éviction des fondateurs, ainsi que pour l'entrée de nouveaux membres et le remplacement. Des plus, la disparité de la répartition de la propriété après l'évolution de l'équipe est affectée différents évènements affectent différemment l'ampleur de. Ces résultats mettent en lumière l'importance de la chronologie des changements des équipes.

Mots-clés : décisions entrepreneuriales ; perception de l'incertitude ; caractéristique linguistique ; temps futur flexionnel ; résultat entrepreneurial ; fort développement ; entrepreneur habituel ; équipe fondatrice entrepreneuriale ; finance entrepreneuriale ; chronologie

Entrepreneurs' decisions

Venture creation, high-growth entrepreneurs, and founding team evolution

Abstract

Entrepreneurs contribute significantly to economic activities and job creation. Engaging in entrepreneurial activities requires entrepreneurs to face the high likelihood of failure, take risks, and bear a great deal of uncertainty. Hence, understanding and identifying factors that contribute to individuals starting a business, keeping engaging in and growing their entrepreneurial activities are crucial. This study explores 1) a novel factor that determines various levels of entrepreneurial propensity across countries and cultures and 2) how the entrepreneurs and entrepreneurial teams choose their development paths and evolvement.

Chapter 1 illustrates and initiatively employs a linguistic feature of future tense, inflectional morphology (i.e., conjugation) for future tense (IF), to measure the perception of uncertainty, and explores its effect on a country's entrepreneurial propensity. Using inflectional morphology for future tense is argued to make speakers perceive uncertainty intensely. Therefore, their resident countries and regions experience fewer new ventures created. The empirical evidence supports the proposition by using the country-level data in 137 countries from 2010 to 2018. The finding implies that the linguistic feature of future tense can serve as the institutional factor of an individual's perception of uncertainty and contribute to the heterogeneity of nationwide and regional entrepreneurial propensity.

Chapter 2 investigates whether the founding team composition of novice entrepreneurs help predict whether they become high-growth entrepreneurs. Unlike previous research, this study takes the entrepreneur's perspective by tracking 1000 novice entrepreneurs' entrepreneurial activity in their first ten years. The results show

that team composition in the very first company matters for the likelihood that entrepreneurs ultimately experience high-growth status. The findings further indicate that non-family members participating as business partners in the very first company of the entrepreneurs help them become habitual. Moreover, high-growth entrepreneurs are more often habitual entrepreneurs. When running the analysis at the company level, different results appear, which highlights the need for choosing well the level of analysis when comparing the outcomes of entrepreneurial activity.

Chapter 3 assesses the evolution of entrepreneurial founding teams (EFTs). EFTs are key drivers of new ventures' success, but they are not static over time. In this chapter, the temporality of EFT evolutionary events is highlighted and evidenced to make different consequences. This investigation was conducted by tracking 1,000 U.K. EFTs for the first ten years of their ventures. Based on the temporal sequence of founder departure and new member entry, founder crowd-out and replacement are two newly defined types of evolution. The results reveal different antecedents (equity ownership, alternative entrepreneurial opportunity and the disparity of ownership distribution) for founder departure and crowd-out, as well as for new member entry and replacement. Furthermore, the disparity of ownership after evolution is affected differently by evolutionary events in terms of magnitude. These findings shed light on the importance of the temporality of EFT evolutionary events.

Key words: entrepreneurial decisions; uncertainty perception; linguistic feature; inflectional future tense; entrepreneurial outcome; high-growth; habitual entrepreneur; entrepreneurial founding team; entrepreneurial finance; temporality

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General Introduction

Entrepreneurs contribute significantly to economic activities and job creation (Haltiwanger, Jarmin, and Miranda, 2013; Malchow-Møller, Schjerning, and Sørensen, 2011). Engaging in entrepreneurial activities requires entrepreneurs to face the high likelihood of failure, to take risks (Parker, 2014), and to bear a great deal of uncertainty (Knight, 1921; Lortie, Barreto and Cox, 2019; Say, 1803; Schmitt et al., 2018; Singh, Corner and Pavlovich, 2007; Stone and Brush, 1996; Townsend et al. 2018).

Hence, understanding and identifying factors that contribute to individuals starting, keeping engaging in and growing their entrepreneurial activities are crucial. Doing so is for encouraging their entrepreneurial intention, supporting them and building a prosperous entrepreneurial society. This study explores 1) a novel factor that determines various levels of entrepreneurial propensity across countries and cultures and 2) how the entrepreneurs and entrepreneurial teams choose their development paths and evolve.

First, Chapter 1 examines the effect of an informal institutional factor, linguistic features, on worldwide individuals' heterogeneous decisions to create new ventures (i.e. entrepreneurial propensity). I conjectured that linguistic features in different languages affect speakers' perception of uncertainty and further influence regional- and country-level entrepreneurial propensity. McMullen and Shepherd (2006) adverted that perception of uncertainty may lead to varying decisions and actions of creating new ventures.

Individual's perception of uncertainty can be derived from one's characteristics (Barnes Jr., 1984; Gorgievski and Stephan, 2016; Caliendo, Fossen and Kritikos, 2009; Parker, 2014; Van Ness and Seifert, 2016) and environmental traits, such as countries' characteristics (Blanchflower, Oswald and Stutzer, 2001), government regulations (Straub, 2016; Levie and Autio, 2011), education (Konon and Kritikos, 2018), social

context, and culture (Busenitz and Lau, 1996; Lortie, Barreto and Cox, 2019; Stephan and Pathak, 2016; Morrison 2000).

Meanwhile, another long-proposed but frequently neglected environmental trait has been identified that influences an individual's economic decisions and behaviours. The factor is language. Sapir (1921) and Whorf (1956) had proposed the linguistic relativity theory, which suggests that individuals' perception of the world and time varies due to the different features of the language they use. However, language is conventionally considered a subordinate field of culture (Santacreu-Vasut et al., 2014).

Chen (2013) proposed the Language-Saving Hypothesis (LSH), in which he claimed that future time reference (henceforth, FTR) influences people's saving and wellbeing behaviour. He evidenced that people who speak languages that closely associate the present with the future (weak FTR) make less distinction between the present and the future; therefore, they show more future-oriented economic and health behaviour. Hechavarría et al. (2018) and Tang et al. (2021) emphasised the prominence of language as a vital institutional factor. By studying linguistic features used in different languages, they indicated the role of language in labour market dynamics across nations and cultures.

Research in socioeconomic and finance showed the effect of language on individual economic decisions and behaviour (Kim, Kim and Zhou, 2017; Chen et al., 2017; and Chi et al., 2020). However, its effect on entrepreneurship and jagged worldwide entrepreneurial propensity has received little attention (Hechavarría et al., 2018). Although Tang et al. (2021) showed the positive effect of strong-FTR on innovative new venture creation, the innovative venture creation cannot represent the country-level entrepreneurial propensity. This paper examines whether FTR explains cross-country heterogeneous entrepreneurial propensity to fill this gap.

Notably, in addition to FTR, another linguistic feature, inflected future tense (henceforth, IF), is conjectured to impact an individual's perception of uncertainty in this study. IF is a stable feature in verbal categories in linguistics (Dediu and Cysouw, 2013) and has different applications across languages. IF requires conjugating the infinitive form of a verb (by either adding a prefix/affix or completely changing the infinitive form of verbs in the future tense). IF is widely used in temporal clauses and mandatory in a sentence expressing predictions for the future (which are independent of human intentions and planning) (Dahl and Velupillai, 2013).

Some languages, such as English and German, do not have IF but have an auxiliary word to express future actions or events. Other languages, such as French and Italian, require IF to construct the future tense. Because it requires speakers to change the form of verbs (which makes the future deviate more from the present and other tenses or aspects), it is conjectured that people who speak languages with IF perceive uncertainty more intensely.

Moreover, neurolinguistics has shown a relationship between inflectional morphology and cerebral activities. The left posterior inferior frontal gyri process various inflectional morphology for nouns and marking tense. This cerebral region is more activated when the inflectional morphology is applied to verbs than nouns (Tyler et al., 2004). This finding suggests that marking tense through inflecting the verbs activates this cerebral region. Additionally, this cerebral area is also activated when decisions are difficult to make (Rolls et al., 2008) and when rewards are expected (Tops and Boksem, 2011). Accordingly, speakers are hypothesised to perceive uncertainties more intensely when the language they speak uses IF for future actions or events. In other words, it is conjectured that using the languages containing IF has a profound effect on individual engagement in entrepreneurial activities and the societies' entrepreneurial propensity.

The number of individual-owned and managed SMEs was collected to test the prior conjecture. The sampled SMEs were created between 2010 and 2018 in 137 countries/zones and subnational regions with more than one official language spoken. The Tobit and Poisson regression are applied using panel country-level and region-level data, respectively. The variables of interest are IF, FTR (Chen, 2013), and the indicator variables for the combination of IF and FTR.

The results evidenced the vital role of IF in explaining cross-country and -region differences in entrepreneurial propensity. But FTR shows no significance. When countries where the majority spoken language incorporates IF, suggesting speakers' intense perception of uncertainty, fewer new SMEs were created. Such finding is robust after controlling for GDP per capita, unemployment rate, population, legal origin, cultural dimensions and 12 measures from Global Entrepreneurship Monitor (GEM) NES entrepreneurial framework condition. The same conclusion is drawn when testing at the regional level in multiple official language-speaking countries, like Belgium. Therefore, the first research question was answered concerning why entrepreneurial propensity in some societies is higher than others.

The second objective of this study is to respond to how entrepreneurs choose their development path (i.e. being a habitual entrepreneur) and how entrepreneurial teams evolve. In Chapter 2, the development path and outcomes are analyzed. Entrepreneurs are not a homogenous group of individuals. After individuals decide to engage in entrepreneurial activities for the first time, they have different development paths that lead to various outcomes: some grow quickly in terms of their assets (high-growth), while some do not.

However, most prior studies focus on entrepreneurial decisions and performance by measuring them at the company level (Basu, 1998; Parker and Van Praag, 2006; Baron, 2007; Hmieleski and Baron, 2009; Zhao, Seibert, and Lumpkin, 2010). It should be

equally important to focus on the entrepreneur level, especially high-growth entrepreneurs.

An important factor that affects entrepreneurial activities is the team composition and size when the first start-up is created. They represent the existing personal relationship (e.g., family relationships) of involved co-founders beyond the workplace (Ko, Wiklund, and Pollack, 2021). Having co-founders can reduce the risks of individual entrepreneurs and expand business networks more easily (Cooper, Gimeno-Gascon and Woo, 1994; West and Cooper, 2009). It may be particularly true when engaging in entrepreneurial activities for the first time. Nonetheless, the impact of initial founding team composition and size on the organisational strategy that entrepreneurs adopt remains unexplored.

This study fills this gap. Determinants of becoming a habitual entrepreneur can help us understand how an entrepreneur generates high growth (i.e., the growth model, as pointed out by McKelvie and Wiklund, 2010). Moreover, how does it affect these activities' overall size and financing over the long run? Ultimately, does it help identify high-growth entrepreneurs?

A random sample of 1,000 entrepreneurs is collected using U.K. registry data of first-time entrepreneurs in 2010, which we then tracked until 2019. Thus, all entrepreneurs in the sample were nascent entrepreneurs in 2010. Information is gathered on entrepreneurs' demographics (name, age, gender and nationality), their prior managerial experience (without being an owner) in other companies they have worked for before 2010, and the team composition of the companies in 2010. Additionally, all the companies they joined, founded or co-founded during their first ten-year entrepreneurship are collected for the year of participation or incorporation, ownership structure, founders, location, industry, capital structure and total asset until 2019 (or earlier if liquidated or sold before).

Doing so allows us to categorise entrepreneurs into three categories: single entrepreneurs (who started their first company in 2010 and did not start any new venture afterwards in ten years), serial entrepreneurs (who held at least two companies sequentially over time, with possibly an overlap of no more than 2 years), and portfolio entrepreneurs (who held at least two companies at the same time during at least 2 overlapping years). The latter two categories are habitual entrepreneurs. Such categorisation enables us to obtain outcomes measures after ten years of entrepreneurial activities. To make the comparison feasible and avoid the potential biases caused by missing data in 2019, the entrepreneurs' outcomes, i.e. equity ownership, managed assets, owned assets and leverage ratio, were calculated using the average of the last three years, 2017-2019.

The results from Probit regression suggest that the participation of non-family co-founders increases the likelihood of becoming a habitual entrepreneur. This result reveals the meaningfulness of non-family co-founders in nascent entrepreneurs' entrepreneurial long-term career paths. It implies that factors such as resource availability may be at play.

Concerning the outcomes, different statistic methodologies were applied. First, considering that equity ownership and leverage are left-censored at zero, Tobit regressions with instrumental variables were performed. The results evidenced that habitual entrepreneurs owned fewer equities in a single company but did not significantly reduce their overall ownership. Habitual entrepreneurs show no difference in finance (leverage) compared to single entrepreneurs. Two-stage least squares (2sls) linear regression was implemented to compare entrepreneurs' owned and managed assets. The results reported that having co-founders strongly impacts the assets managed by the entrepreneur. Interestingly, while assets managed are higher, the amount of assets personally owned by the entrepreneur is not affected by co-founders.

In terms of high-growth entrepreneurs, the results from Probit regression suggested that habitual entrepreneurs increased the likelihood of becoming high-growth entrepreneurs. Additionally, high-growth habitual entrepreneurs' first companies contribute significantly to their overall growth. The team composition also plays a vital role in growth. Family and non-family co-founders positively contributed to becoming high-growth entrepreneurs in the first ten years of entrepreneurial activity. Until then, the development path of nascent entrepreneurs was mapped.

Finally, Chapter 3 explored entrepreneurial founding teams (henceforth, EFTs) evolution in early-stage ventures. The team of first start-ups measures the initial networks of entrepreneurs, but EFTs also evolve (Chandler et al., 2005; Lazar et al., 2020; Loane et al., 2014; Patzelt et al., 2020; Ucbasaran et al., 2003) even in the early phase of the venture. Patzelt et al. (2020) propose the double life cycle framework that EFTs evolve as the departure of team members (team dissolution) and/or the entry of new members (team formation) at any phase (incorporation, mature and decay) of a venture.

The evolution of entrepreneurial teams in the early-phase venture has imprinting effects on ventures' development and performance (Chandler, Honig and Wiklund, 2005; Ko, Wiklund and Pollack, 2021). The high exit rate in the early stage of ventures (DeTienne, 2010) has drawn abundant academia's attention and research (Bates, 2005; Boeker and Karichalil, 2002; Hellerstedt, Aldrich and Wiklunk, 2007; DeTienne, 2010; DeTienne and Cardon, 2012; Wennberg and DeTienne, 2014; Parastuty et al. 2016). Nonetheless, only a handful of studies provided a balanced picture with attention to both new team member addition and co-founders' departure during the team formation process (Lazard et al., 2020). This study aims to complement this subject.

In addition, the temporality of EFTs evolution remains unexplored. It is vital given that entrepreneurship is a process (Aldrich et al., 1986) and "temporal dynamics are the

heart of entrepreneurship" (Bird & West III, 1998: 5). Kang and Uhlenbruck (2006) pointed out that the sequence of events in entrepreneurship shapes and modifies entrepreneurial activity. As evidenced in established firms, the different sequences of CEOs and top management team (TMT) members changes lead to different outcomes for the firm (Tangpong et al., 2021).

In this study, two additional types of EFT evolutionary events are considered to highlight the temporality in EFTs' evolution. I defined introducing a new member after a founder's departure as a replacement, while the founders' departure after new member entry as founder crowd-out. And then, I examined and compared the factors and consequences of such evolutionary events.

Equity ownership is the variable of interest at both the founder and team levels. Founders' equity ownership or so-called "sweat equity" (Cooney, 2005: 230) plays an essential role in motivating an entrepreneur's contribution to the venture (Ucbasaran et al., 2003) and determines an entrepreneur's financial rewards as well as the level of power and control within the venture (Boeker and Wiltbank, 2005: 126; Breugst, Patzelt and Rathgeber, 2015). Breugst, Patzelt and Rathgeber (2015) showed the negative impact of the low perceived justice of equity distribution on team interaction and attraction over time and eventually led to team member exit and undesirable levels of team and venture performance.

In addition, founders' alternative entrepreneurial opportunities (i.e. being owner-managers in other companies) can explain their departure decisions (DeTienne, 2010). Such entrepreneurs' emotional attachment and stake to one venture may be reduced compared to entrepreneurs who owned only one venture. Pursuing alternative entrepreneurial opportunities by discontinuing or leaving one venture may explain the serial entrepreneur's behaviour, but not portfolio entrepreneurs who simultaneously

owned and managed more than one venture (Westhead and Wright, 1998). No empirical studies have investigated this subject. This study filled such a gap.

The reasons for introducing a new team member are consistent in prior studies – seeking resources or inheriting from the family business perspective. The recruitment of new members is essential for surviving, expanding and overcoming the disadvantage brought by smallness, newness and financial constraints in early-phase ventures (Forbes et al. 2006). Hence, the main reason for recruiting a new member is less likely associated with ownership distribution.

While the effect of team evolution is imprinting, no prior studies showed the short-term effects of team evolution on the distribution of equity within a team in early-stage ventures. It is essential because the short-term effect may provide implications for team evolution in the next stage. Distributing equity is a complicated and tension-filled decision (Wasserman, 2012). After experiencing the reformation of EFTs, the remaining members may reconsider the distribution of equity to prevent the team from future exits (Patzelt, Preller and Breugst, 2020). However, there is a vacancy in empirical research on how the distribution changes (i.e. more dispersed or centralised) after the different evolutionary events.

These concerns were answered by using a manually collected random sample from Orbis. It comprises 1000 U.K. privately owned ventures created by EFTs in 2010. And then, I tracked their evolution until 2019. Given a ten-year observation window, 2212 founders and 80 new added members were involved in teams' evolution. Three levels of information were gathered first at the entrepreneur level and used to calculate the team-level variables. Information includes entrepreneur's name, age, gender, nationality, the entrepreneur's occupation/function in the focal venture, entrepreneurial experience before entering the focal venture, senior managerial experience before entering the focal venture, the experience of dissolving a venture before entering the focal venture and

concurrent holdings in other ventures. Team-level variables were calculated based on entrepreneur-level variables. Ventures' assets and industry were collected for controlling variables.

I used the survival analysis (Cox model) to determine the factors of founders departing, crowding out, and teams evolution. The results showed that owing more equity decreases the rate of founders' departure and crowd-out. Having alternative entrepreneurial opportunities increases only the rate of founders' crowd-out, not founders' departure. Meanwhile, the inequality of ownership distribution increases the rate of founders' departure, but it is not the case for crowd-out. These findings signify the importance of distinguishing the temporal sequence of events in determining the nature of the founder's departure. As hypothesized, the ownership distribution plays no role in new member entry and replacement.

The consequence of team evolution was detected by the dynamic model for panel data (DPD) using system GMM estimation. Teams who experienced team evolution decreases ownership distribution disparity. When distinguishing four types of team evolution, founder departure and crowd-out positively affected equal ownership distribution, though the founder departure showed a more considerable effect. New member entry and replacement do not impact ownership distribution. When comparing the impacts of founder crowd-out and replacement, one can conclude that the different temporal sequences of team evolutionary events vary the consequences.

All in all, this research contributes to entrepreneurship in the following aspects. First, it provides a neglected informal institution, linguistic features, explaining worldwide jagged entrepreneurial propensity. It advances our understanding of persistent attitudes toward uncertainty in entrepreneurial activity across countries, regions, and time.

Second, it contributes to the literature on habitual and high-growth entrepreneurship. The unique empirical approach in this study sheds light on how initial entrepreneurial

founding teams affect the life cycle of entrepreneurial ventures (Patzelt et al., 2020). In other words, more non-family co-founders lead more often to habitual entrepreneurship. They tend to speed up the growth of entrepreneurial activities as a whole. Also, the features of entrepreneurs' initial choice of co-founders are helpful in terms of the early identification of high-growth entrepreneurs and their strategy for growing their activities.

Last, it extends the barely studied field of entrepreneurial founding teams (EFTs) turnover in the early-phase ventures. The findings illustrate the temporality in entrepreneurship and the complex dynamic of EFTs by analysing at both the entrepreneur and team levels. In addition, it sheds light on the impact of an entrepreneur's equity ownership and ownership distribution within a team on entrepreneurs' and teams' evolution in early-phase ventures. Besides, this study fills the gap by evidencing the short-term effect of team evolution on equity distribution strategies in young ventures. It provides implications for the team evolution and financing decisions in ventures' next stage.

Chapter 1

When we talk about the future: the effect of uncertainty perception on entrepreneurial propensity

Language shapes the speaker's mind. This study initiatively employs a stable linguistic feature of future tense, inflectional morphology for future tense (IF), to measure the perception of uncertainty, and explores the effect of uncertainty perception on a country's entrepreneurial propensity. I argue that using inflectional morphology for future tense makes speakers perceive uncertainty intensely. Therefore, their resident countries and regions experience fewer new ventures created, namely less prosperous entrepreneurial activities. The empirical evidence of this study supported the proposition by using the country-level data in 137 countries from 2010 to 2018 (and region-level in three countries where different official languages are spoken in regions). The finding implies that the linguistic feature of future tense can serve as the institutional factor of an individual's perception of uncertainty and contribute to the heterogeneity of nationwide and regional entrepreneurial propensity. The results are robust after controlling for culture, law origin, and alternative measurement of entrepreneurial propensity.

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1.1 Introduction

Straub (2016) articulated that building entrepreneurial societies is one of the significant challenges in the 21st century for most countries. While, engaging in entrepreneurial activities requires entrepreneurs facing the high likelihood of failure, willingness to take risks (Parker, 2014), and bearing a great deal of uncertainty (Say, 1803; Knight, 1921; Stone and Brush, 1996; Schmitt et al., 2018; Singh, Corner and Pavlovich, 2007; Townsend et al. 2018). Hence, the uncertainty involved in entrepreneurship is not trivial (see such as Lortie, Barreto and Cox, 2019).

Differently perceiving uncertainty influences individuals' decisions of entrepreneurship. McMullen and Shepherd (2006) adverted that perception of uncertainty may lead to varying decisions and actions of creating new ventures. Accordingly, it is sensible to enquire about sources of different levels of uncertainty perception. They can attribute to the individual (Lanivich et al. 2022; Parker, 2014; Van Ness and Seifert, 2016) and environmental traits (Straub, 2016; Levie and Autio, 2011; Konon and Kritikos, 2018; Mitchell et al. 2000; Lortie, Barreto and Cox, 2019; Stephan and Pathak, 2016; Morrison 2000).

This study aims to explore a neglected factor in considering the perception of uncertainty – languages1. Language has been long considered a subordinate field of culture (Santacreu-Vasut et al., 2014). However, Hechavarría et al. (2018) emphasized the prominence of language as a vital institutional factor and indicated the potential role of language in labour market dynamics across nations and cultures. According to Sapir-Whorf Hypothesis (Sapir, 1921; Whorf, 1956), individuals' perception of the world and time varies due to the different features of the language they use. Although languages evolve, some linguistic features are stable over time and across different definitions and methods (Dediu and Cysouw, 2013). And yet, a

[1] The language in the study is the language itself, rather than the style of language that the entrepreneurs speak as studied in Parhankangas and Renko (2017) or Allison, McKenny and Short (2013).

limited number of studies show the effect of linguistics on jagged worldwide entrepreneurial propensity (Hechavarría et al., 2018). This study proposes that language is another possible missing puzzle that impacts the perception of uncertainty and explains cross-country, cross-culture, and cross-region differences in entrepreneurial propensity.

This study focuses on the future tense that conveys varying shades of certainty and uncertainty (Copley, 2009, p. 12; see also Heusinger et al., 2019). The future inherits more uncertainties than talking about the past (Grant and Tybout, 2008) and the present. Two features entered the focus. One is future time reference (FTR) which was proposed by Chen (2013), and the other is inflectional future (IF)2 which is a linguistic term. FTR reflects whether a language grammatically marks the future tense when predicting future events. And IF requires conjugating the infinitive forms of the verb when constructing the future tense.

Findings (Chen, 2013; Chen et al., 2017; Kim et al.,2017; Chi et al., 2020 and Osei-Tutu and Weill, 2021) have shown the effect of FTR on people's decisions and their economic behaviour. Chen (2013) suggested that weak FTR language speaking individuals perceive the future close to the present; therefore, they show more future-oriented economic and wellbeing behaviour. Hence, I ask the question: do the differences in constructing and expressing the future tense in languages explain the variations in worldwide entrepreneurial propensity?

Apart from FTR, this study advances and conjectures that IF also plays a crucial role in influencing individuals' behaviour. Based on semantics, IF is used to express predictions (Dahl and Velupillai, 2013), uncertainty (Sedano, 1994 in Arroyo, 2008), and a less certain outcome in the distant future. Neurolinguistic finding (Kemmerer and Eggleston, 2010) shows that using inflectional morphology on verbs activates the

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[2] *In linguistics, morphology refers to the mental system involved in word formation or to the branch of linguistics that deals with words, their internal structure, and how they are formed* (Aronoff and Fudeman, 2005, p. 1). Hereafter, the phrase 'form' and 'morphology' are interchangeable. But the linguistic term, *morphology*, is preferred.

cerebral region that is also activated when decisions are difficult to make (Rolls et al., 2008), and a reward is expected (Tops and Boksem, 2011). Accordingly, whether or not speakers stimulate this cerebral region when talking about the future may differentiate their perceptions of the uncertainty. I conjecture that the differences in using IF for constructing the future tense convey the different levels of perception of uncertainty. It is, thus, likely to influence individuals' decisions.

To be exact, I hypothesized that people who speak languages that use IF perceive uncertainty more intensely for two reasons. It requires speakers to change the form of verbs, which causes the future to deviate from the past, the present and infinitive forms of verbs. Therefore, talking about future actions and events seems to vary from the past to the present, suggesting a strict distinction between the future and the present. Another reason is that speakers feel like making difficult decisions that make them perceive uncertainty more intensely when talking about future events or uncertain outcomes using IF. Therefore, individuals who speak IF languages are less likely to act on creating ventures, causing a low level of entrepreneurial propensity.

To examine the research question and hypothesis, I collected the number of individual-owned and managed SMEs established between 2010 and 2018 in each country/zone3and region with more than one official language spoken widely in a particular area. I performed the Tobit regression using panel country-level data to test the effects of IF and FTR (Chen, 2013) and the influence of the combination of IF and FTR on entrepreneurial activity with controlling several socioeconomic and business ecosystem variables.

The results evidence that the countries where the majority spoken language incorporates IF, suggesting intense perception of uncertainty, have fewer new SMEs created or scanty entrepreneurship. However, the strong FTR is unable to explain the differences in entrepreneurial propensity across countries. The effect of uncertainty

[3] The term 'zone' or 'zones' are used because they are the terms used on the Orbis. To avoid inconsistency, the terms 'country' or 'countries' are used in the rest of the sections.

perception holds when I test using region-level data in multiple official language speaking countries like Belgium and Switzerland, after controlling for the fixed effects of region, year, and the interaction between region and year.

The present study extends the novel theory regarding the relationship between the perception of uncertainty, proxied by the linguistic feature, and cross-country heterogeneity in entrepreneurial propensity. Admittedly, the prior study showed the effect of uncertainty avoidance on entrepreneurial cognition (Busenitz and Lau, 1996). And Tang et al. (2021) evidenced the significant role of FTR, as an institutional factor, in explaining innovative venture creation across countries. I advanced these findings by investigating another important linguistic feature and widening to new venture creation in every recorded sector, given the particularity of innovative new ventures. My conjecture that the features of future tense construction influence the perception of uncertainty sheds light on the importance of linguistic features and advances the understanding of persistent risk attitude in entrepreneurial activity across countries, regions, and time. It suggests that an individual's perception of uncertainty may be profoundly impacted by the languages they use. These results are robust after controlling for culture, using alternative measurement of law origin, and another measure of entrepreneurial propensity.

The remainder of this chapter is structured as follows. Section 1.2 reviews the literature in terms of the role of uncertainty and other factors in entrepreneurial propensity. Also, I introduce the details of inflectional morphology for marking the future tense in linguistics and its applications and the findings showing the future tense influencing economy, accounting, corporate investment, and management. Subsequently, testable hypotheses are established. Section 1.3 provides information regarding the data collection, linguistic feature categorization, and methodology. Section 1.4 presents the empirical results and data analysis. Section 1.5 and 1.6 report robustness tests and discussion. Conclusions are drawn in Section 1.7.

1.2. Literature review and hypothesis development

1.2.1 The entrepreneurial propensity in the world

Straub (2016) states that building entrepreneurial societies is one of the significant challenges in the 21st century for most countries. Prior studies have broadly demonstrated the vital role of small businesses in economic growth and employment (Thurik and Wennekers, 2004; Wong, Ho and Autio, 2005). Thus, the prosperity of small business creation is vital to the economy.

Meanwhile, engaging in entrepreneurial activity is associated with uncertainty, ambiguity, risk, and complexity (Townsend et al., 2018). Becoming an entrepreneur involves the willingness to take risks (Parker, 2014; Van Ness and Seifert, 2016), to encounter the high likelihood of failure, and to bear a great deal of uncertainty (Say, 1803; Schmitt et al., 2018; Singh, Corner and Pavlovich, 2007). Merriam-Webster Dictionary defined "entrepreneur as 'one who organizes, manages, and assumes the risks of a business or enterprise" (2015, in Zaleskiewicz, Bernady and Traczyk, 2020). Lanivich et al. (2022) summarized the important influence of time and uncertainty on entrepreneurial processes.

It is intuitive to say that a society's attitudes towards uncertainty lead to the cross-country variation of the prosperity of entrepreneurship or the creation of SMEs. Despite the view that entrepreneurship is a self-determination decision (Van Ness and Seifert, 2016), social context and culture elements are conventionally related to entrepreneurial cognition and outcomes and entrepreneurial decisions (Busenitz and Lau, 1996). There are a number of cross-country studies that identified socioeconomic factors that impact the entry, prosperity of entrepreneurial comportment and entrepreneurial attitudes, such as government regulations (Straub, 2016; Levie and Autio, 2011), education (Konon and Kritikos, 2018), cultural factors in terms of power distance and individualism (Mitchell et al. 2000) and long-term orientation (Lortie, Barreto and Cox, 2019), charismatic and self-protective from Culturally-endorsed implicit Leadership Theory (Stephan and Pathak, 2016), and family (Morrison 2000). Intriguingly, the linguistic features investigated concerning

entrepreneurs' entry decisions is the sex-based linguistic system (Hechavarría et al., 2018) and the FTR in Tang et al. (2021).

Also, the country where entrepreneurs create their ventures matters, as Blanchflower, Oswald and Stutzer (2001, p. 680) pointed out that *large numbers of people in the industrial countries say they would prefer to be self-employed*. As for the regional difference of entrepreneurial propensity, Kotey (2006) indicated that the difference in resources, natural resources, infrastructure, and human and financial resources could explain the differences in entrepreneurship. And the demographic difference is also another variance among regions.

Personal variables play another essential role in influencing individuals' entrepreneurial cognition (Busenitz and Lau, 1996) and their venture creation decision. Individuals' psychological factors impact their decision-making process (Barnes Jr., 1984; Gorgievski and Stephan, 2016). McMullen and Shepherd (2006) have pointed out that individuals' different perceptions of uncertainty may vary the decision and action of creating new ventures. For instance, the fear of failing in entrepreneurship is highly like to impact individuals' entry decisions on engaging in entrepreneurial activities (Caliendo, Fossen and Kritikos, 2009).

From this perspective, I argue that different levels of perception of uncertainty in a society, country and region are likely to be a variation to cause the variation of entrepreneurial propensity.

1.2.2 Language-cognition effect and inflectional future tense

Language is a complex behaviour that involves multiple senses and motor skills, and the coordination among them (Chen et al. 2009, p.2). Comprehension of a language involves multiple senses (Chen et al., 2009) and activates different cerebral regions. The Sapir-Whorf Hypothesis (Sapir, 1921; Whorf, 1956), also known as linguistic relativity theory, posits the impact of language on cognition. It claims that

individuals' conception of the world and time varies due to the different features of the language they use.

Undoubtedly, language *is perpetually in a state of change* (Aitchison, 2005, p. 3). Yet, there are some relatively stable aspects in linguistic features (Dediu and Cysouw, 2013). Time reference in linguistic morphology is one of the relatively stable features over time and across different definitions and methods. Notably, the application of inflectional morphology for the future tense (henceforth, IF) is the seventh most stable feature out of 17 items in the verbal categories (Dediu and Cysouw, 2013).

Neurolinguistic studies have shown that the left posterior middle and inferior frontal gyri play indispensable roles in processing various inflectional morphology used for nouns and marking tenses (Kemmerer and Eggleston, 2010). The LIFG (left inferior frontal gyri) is activated more when the inflectional morphology is applied to verbs than to nouns (Tyler et al. 2004). This cerebral region is also activated when decisions are difficult to make (Rolls et al., 2008) and when rewards are expected (Tops and Boksem, 2011). As Rolls (2005) summarizes, the activation in the LIFG *may be related to the engagement of planning using verbal processing to supplement more direct decision-making based on direct (implicit) estimates of rewards* […] (in Rolls et al.2008, p. 661). Therefore, when speakers use IF to talk about *future* actions or events, they are likely to perceive uncertainty more intensely as making tough decisions and expecting rewards.

Indeed, the future inherits more uncertainties than talking about the past (Grant and Tybout, 2008) and the present, and expressing the future itself *conveys varying shades of certainty and uncertainty* (Copley, 2009, p. 12; see also Heusinger et al., 2019). Although a limited number of languages are not equipped with the grammatical means for marking the future (Dahl and Velupillai, 2013), inflectional morphology is not universally required in marking and constructing the future tense in languages. Some languages, such as English and German, do not have IF but have an auxiliary

word to express future actions or events. Other languages, such as French and Italian, require IF to construct the future tense.

English and semantics	German	Mandarin Chinese
The plane leaves at 10 in the evening. *(For a scheduled future event)*	Das Flugzeug startet um 22 Uhr. (Literal translation: The plane leaves at 22.00.	Fēijī zài wǎnshàng shí diǎn líkāi. (Literal translation: Plane in the evening 10 o'clock leave(s).)
The plane is about to leave. *(For an event in the near future)*	Das Flugzeug fliegt bald ab. (Literal translation: The plane is leaving soon.)	Fēijī jíjiāng líkāi. (Literal translation: Plane soon leave(s).
I am starting work tomorrow. *(For a planned future event)*	Ich fange morgen mit der Arbeit an. (Literal translation: I start tomorrow with the work on.)	Wǒ míngtiān kāishǐ gōngzuò. (Literal translation: I tomorrow start (to) work.)
It will be cold tomorrow. *(For a prediction)*	Morgen ist es kalt. (Literal translation: Tomorrow is it cold.)	Míngtiān lěng. (Literal translation: Tomorrow (it is) cold.)

In general, there are three ways of constructing the future tense in languages. The first way is to use the present tense. In English semantics, the present tense can express scheduled events in the near future, and the present continuous can express planned/arranged future events. German and Mandarin Chinese can describe both planned and unscheduled future events using the present tense. The following examples illustrate this type of future tense construction.

Also, one can use the present continuous or present morphology of '*go*' to construct the future tense (as shown in Example 1), which is to express prior plans (decisions made before the moment of speaking) and predictions with evidence, both suggesting *a strong sense of preparation* (Dahl, 2000, p. 3).

Example 1:		
English and semantics	**Dutch**	**Mandarin Chinese**
I am going to work tomorrow. *(For prior plans)*	Ik ga morgen werken. (Literal translation: I am going to tomorrow work.)	Wǒ míngtiān qù shàngbān. (Literal translation: I tomorrow go (to) work.)

The second way is the periphrastic future tense that requires the addition of an auxiliary word (such as *will* in English) before the infinitive form of verbs (as shown

in Example 2). For example, '*will*' expresses predictions, offers, suggestions, or promises, as well as events that are certain to happen in the future in English. In other words, the use of *will* in English is *for both intention-based and prediction-based future events* (Dahl, 2000, p. 10). In German, the future tense (*Futur 1*), formed with *werden (will),* expresses assumptions about the future and the present. In Dutch, the future tense formed with *zullen (will)* expresses a promise or a proposal and events that will most certainly happen in the future. *Future-denoting expressions* in Mandarin Chinese also function similarly to *will* in English (Wu and Kuo, 2010, p. 54).

Even though there are inflectional morphologies in future-referring forms in Greek active voice, the morphologies are firstly adding the particle *θα*, and then changing verbs based on stems of the past tense with the present suffix based on the person (for the simple future tense) and the present perfect tense (for the future perfect) (Greekgrammar, 2020). In other words, there is no future-specific inflection in Greek.

Example 2:

English and semantics	**Dutch**	**German**	**Mandarin Chinese (pronunciation)**	**Greek (pronunciation)**
She will stay.	Ze zal blijven.	Sie wird bleiben.	-Tā huì/jiāng/yào liú xiàlái. -Tā yào liú xiàlái le.[4]	θα μείνει. (Pronunciation: Tha meínei.)

The periphrastic future tense also exists in French[5], Spanish, Lithuanian, and informal writing Portuguese[6] (as shown in Example 3). It is similar to using the present continuous in the first means of future construction. The periphrastic future tense in such languages is used to express proximity to the time of the speech, an imminent

[4] By adding *le* at the end of the sentence with *yào*, the meaning becomes to the opposite of a previous decision.

[5] This form of the future tense is also called le futur proche (the close future), which is constructed by using the present morphology of aller (to go) before the infinitive form of verbs.

[6] The periphrastic future tense is not considered to be a tense in Portuguese grammar and is considered informal in writing, as it corresponds to 'be going to' in English as well as 'will do' and has a present continuous aspect (Whitlam, 2017, p. 174).

and certain outcome (Grimm, 2010)[7]. The periphrastic future is more frequently used to express greater certainty of its occurrence (Frontier, 1997; King and Nadasdi, 2003).

Example 3:		
English and semantics	**French**	**Portuguese[8]**
She is going to stay.	Elle va rester.	Ela vai ficar.

This study concentrates on the third way of constructing the future tense, IF. It requires the infinitive form to be conjugated (by either adding a prefix/affix[9] or completely changing the infinitive form of verbs in the future tense) (as shown in Example 4). Sedano (1994) suggested that IF is encouraged to express uncertainty in Spanish (in Arroyo, 2008). IF is also used in temporal clauses and is mandatory in a sentence describing future predictions (independent of human intentions and planning) (Dahl and Velupillai, 2013).

I consequently conjecture that people who speak languages with IF[10] perceive uncertainty more intensely, based on the semantic sense and neurolinguistic findings. Since it requires them to change the form of verbs (which makes the future deviate more from the present and other tenses or aspects) and makes, it may feel like that

[7] Studies show that the use of inflectional morphology for the future tense is gradually decreasing as usage of periphrastic future forms are increasing in spoken languages (such as Dahl (2000) for European languages and Grimm (2010) for French in Canada). Therefore, we specify that inflectional morphology 'exists' in these languages to express the future tense. The reduced frequency of periphrastic and inflectional future usage can also imply that the changes in language impact individuals' perception of uncertainty and cause further changes in the national culture.

[8] Here, *ir* ('*to go'*) in Portuguese is based on the person and not on the future tense. The verbs, like work and stay, are infinitive forms.

[9] As stated in Dahl and Velupillai (2013), '*there are some borderline cases where it is unclear if one is dealing with a clitic or an affix*'. In this study, we considered that inflectional morphology exists in a language if the future tense is a conjugation of the infinitive form of the verb (as opposed to morphology reflecting agreement with the person in the present tense).

[10] In this study, the indicator created by Kovacic et al. (2019) to measure attitudes towards uncertainty is not applied because future tenses inevitably involve a component of modality, therefore, *the categories of irrealis, modal and future categories overlap* (Heusinger et al., 2019). we also find a high correlation between the existence of IF and the morphology of the conditional and subjunctive mood. More specifically, languages which have IF also have morphology for the conditional and subjunctive mood. According to language semantics, the conditional mood, differentiated from the indicative, is used for hypothesizing, polite requests, stating the uncertainty of events and rephrasing other people's words, while the subjunctive mood is contrary to the indicative mood. For example, in English, the conditional mood is structured by using modal verbs, e.g. can/could, may/might, shall/should and will/would, before the infinitive verb, while in French, the conditional mood is structured by adding –ais (1st singular person) at the end of verbs or by an irregular morphology of the infinitive form of verbs and adding the suffix. The subjunctive mood in English uses infinitive verbs or *were* for the first person and third person singular of *to be* in the past tense in the clause, while it requires inflectional morphology in French.

they are making difficult decisions (Rolls et al. 2008) or/and expecting rewards (Tops and Boksem, 2011).

Example 4:				
English and semantics	**French**	**Portuguese**	**Lithuanian**	**Slovenian/Slovene**
It *will* rain next week.	Il pleuvr*a* la semaine prochaine. (Literal translation: Will rain the week after.)	Chover*á* na próxima semana. (Literal translation: Will rain the week after.)	Kitą savaitę *lis.* (or) *Bus* lietaus kitą savaitę. (Literal translation: Next week will rain. (or) Be rainy next week.)	Prihodnji teden *bo*[11] deževalo. (Literal translation: The future week will rain.)

In addition to IF, Chen (2013) proposes the Language-Saving Hypothesis (LSH), in which he proposed that future time reference (henceforth, FTR) has influenced people's behaviour. He points out that people who speak a language that closely associates the present with the future (namely, weak FTR) show more future-oriented economic and health behaviour, such as saving more and leading a healthier lifestyle (smoke less and exercise more, for example). Afterwards, Pérez and Tavits (2017) used FTR to explain the acceptance of the future-oriented policy. Kim, Kim and Zhou (2017) show that managers who live in countries with a weak-FTR language are less likely to engage in both accrual-based and real earnings management. They conclude that the future consequence of earnings management is *imminent* for non-future-marker language speakers. Chen et al. (2017) evidenced the positive effects of weak-FTR in languages on companies' precautionary cash holdings. Similarly, Osei-Tutu and Weill (2021) evidenced that strong-FTR is associated with banks' risk-taking behaviour. On the other hand, Chi et al. (2020) showed that weak FTR (future-oriented behaviour) encourages corporations and countries to invest more in innovation or R&D.

[11] IF exists for the verb '*biti (to be)*' in Slovenian/Slovene. The future tense is constructed by using IF of '*biti*' and the conjugated past tense of the other verb.

Regarding the influence of language on entrepreneurship, Hechavarría et al. (2018) found the negative impact of the sex-based and gender-differentiated pronouns on female entrepreneurs' entry decisions. And Tang et al. (2021) evidenced the positive effect of strong FTR, as an institutional factor, on innovative new venture creation. When considering the importance of time and uncertainty in the entrepreneurial process (Lanivich et al., 2022), individuals' perception of time and uncertainty should have influenced their decision to create new ventures. However, the controversial findings from prior studies cause difficulties in interpreting the effect of FTR on speakers risk-taking behaviour. Because if strong FTR speakers have a higher discount rate for costs in the future, such as bankruptcy of new ventures, it should also be applied when discounting the benefits from the future, such as being a wealthy and successful entrepreneur. The former will lead to risk-taking behaviours as the present value of costs is lower for strong FTR speakers. The latter should lead to risk aversion behaviours since the present value of prospect reward seems lower. Hence, the effect of FTR on entrepreneurial propensity is vague.

When integrating IF and FTR together, the interpretation of the effect of future tense on individual perception of future and uncertainty can be more straightforward. I can interpret as follows: when an individual speaks strong FTR language, they either frequently feel the difficulties of decision making and higher expectation for the rewards (IF), thus perceive the uncertainty intensely that results in reduced risk-taking behaviours; or no activation on decision-making difficulties and reward expectation (non-IF), thus perceive the uncertainty less intensely that results in a relatively higher propensity of risk-taking. While no prior study in entrepreneurship advanced the connection between IF and the perception of uncertainty and investigated the effect of such feature and uncertainty perception on entrepreneurial propensity. This study fills this gap by examining the potential effects of linguistic features, IF and FTR (Chen, 2013), on new venture creation and cross-country and -region entrepreneurial propensity.

Hypothesis 1: Countries/regions where the majority spoken language is equipped with IF, indicating the intense perception of uncertainty, have fewer SMEs established by individuals. In other words, ***IF has a negative impact on entrepreneurial propensity.***

Hypothesis 2: Countries/regions where the majority spoken language marks the future grammatically (Strong-FTR), indicating the strong preference to present time and high discounting from future actions or events, have either a smaller or greater number of SMEs established by individuals. In other words, ***Strong-FTR has a negative or positive impact on entrepreneurial propensity.***

Hypothesis 3: Countries/regions have fewer SMEs established by individuals when the majority spoken language marks the future grammatically (Strong-FTR) and inflectional morphology for the future tense (IF). In other words, ***strong FTR and IF languages have a negative impact on entrepreneurial propensity****.*

1.3. Data and Methodology

1.3.1 Data, Sample and Variable Construction

I collected the number of newly created SMEs owned and managed by individuals and established between 2010 and 2018 in 137 countries, with at least one recorded on Orbis. For Belgium, Switzerland and Bosnia and Herzegovina, the sum of newly created SMEs in the region was collected to examine the effects of IF on the regional propensity of entrepreneurship.

To determine the nationwide majority spoken official language, I first refer to the World Factbook of Central Intelligence Agency (CIA) (2020). To encode the value of IF, I mainly refer to the World Atlas of Language Structures (WALS, 2013), linguistic literature (Dahl, 2000; Wu and Kuo, 2010) and further verify the features by consulting grammar websites for languages that were missing from sources as

mentioned above. Languages are categorized into four types based on the interaction[12] between IF and FTR from Chen (2013) (shown in Table 1.1 below with examples). Detailed country, language, the corresponding IF, FTR and language categories are listed in Appendix 1.1.

[Table 1.1 about here]

A number of country-level variables were controlled and collected from different sources and then matched to the country sample. First group control variables are macro socioeconomic variables: the natural logarithm of the total population (ln_pop) for measuring the size of the country; the unemployment rate for measuring the labour market condition (Cowling and Bygrave, 2006); economic structures measured by national gross domestic product (GDP) per capita purchasing power parity and GDP annual growth rate; the Human Development Index (henceforth, HDI[13]) to determine the level of a country's development, which has also considered the education in the country; and civil law as an indicator variable for the legal environment (La Porta, Lopez-de-Silanes and Shleifer, 2008). Then, regarding business environment proxies, I used the ease of doing business score[14] (henceforth, EDB) from the Doing Business rankings of the World Bank.

In addition, following Hechavarría et al. (2018), entrepreneurial ecosystem factors were considered and gathered in GEM NES framework condition measures. In total, 19 control variables were included, along with the year fixed effects. Detailed information for variables is in Appendix 1.2.

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[12] The interaction terms were not used because IF and FTR are both indicator variables. The interaction terms will not be able to show the distinctive effects when the languages are non-IF and strong FTR, and non-IF and weak FTR, as the interaction terms will be zero in both cases.

[13] Instead of using GDP per capita, we used the HDI in this study, which factors in personal income, education and life expectancy (United Nations Development Programme, 2019). It is reasonable to use the HDI in this case since it comprises three important dimensions of a nation's development level.

[14] Since the World Bank published scores that were measured using different methodologies (DB 10-14, DB15, DB16 and DB17-19) for the years covered in this study. To obtain a comparable and full dataset, we collected EDB from 2010 to 2014 based on the DB 10-14 methodology; 2015 EDB from data collected using the DB 15 methodology; 2016 EDB from data collected using the DB 16 methodology; and 2017 and 2018 EDB from data collected using the DB 17-19 methodology.

1.3.2 Methodology

To investigate the effect of uncertainty perception on entrepreneurial propensity, Tobit regression for panel data is firstly performed at the country level. The primary Model uses the natural logarithm of the nationwide number of newly established and individual-owned SMEs as the response variable. The value of the response variable is permanently greater than zero. Therefore, the lower censor was set at zero. The interested explanatory variables are the indicator variable for the intense perception of uncertainty, proxied by IF in the prevalently spoken language in a country, and the indicator variable for the preference to present time, proxied by FTR. Also, three indicator variables were used for language categories as explanatory variables in the primary model[15].

Secondly, the effect of IF was examined on regional entrepreneurial propensity within a multi-official language country[16] in the sample: Belgium, Switzerland, and Bosnia and Herzegovina. The official language in a region means that one of the national official languages is prevalently spoken in a region. As the limited number of region-year data, Poisson regression was performed with robust standard error. Therefore, the raw number of newly created SMEs was collected on the regional level with one of the official languages widely spoken and used as the dependent variable. I controlled for the fixed effect of region, year and the interaction of region and year.

I describe my sampling plan, all data exclusions (if any), all manipulations, and all measures in the study. All data sources, analysis code and research materials are publicly available and listed in Appendix 1.2. Data were analysed using STATA SE 14.0 (StataCorp., 2015) and the package Tobit for panel data and Poisson regression. This study's design and its analysis were not preregistered.

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[15] We used three indicator variables instead of four as a result of the fact that only Brazilian Portuguese is classified as LANG4. Including the indicator variable for LANG4 is likely to cause biased interpretation.

[16] Canada is not examined due to the fact that there is only one state, Quebec, using French as regional official language, and English for the rest of Canada. Also, because missing data on both national level and regional level for the individual owned and managed SMEs, we exclude Canada in the test.

1.4 Empirical Results Analysis

1.4.1 Descriptive Statistics

Figure 1.1 delineates the average number of newly established SMEs by using linguistic features – IF and FTR. The average is considerably larger for countries where the majorly spoken official language does not contain IF and has weak FTR. It is to say that when the language conveys a less intense perception of uncertainty, there are more SMEs created. Also, when society prefers the present to the future, fewer SMEs are created. This phenomenon can be explained by propositions in Chi et al. (2020), stating that weak-FTR speakers perceive the future to be closer to the present, therefore, less discounting a future reward. This perception about the future encourages their investment behaviour and thus stimulates entrepreneurial propensity. At this point, the depiction is consistent with the hypotheses that intense perception of uncertainty (IF) decreases entrepreneurial propensity and suggest that preference to the present (strong FTR) discourages entrepreneurial propensity.

Figure 1.1: The number of newly created SMEs yearly by IF and non-IF, and strong FTR and weak FTR

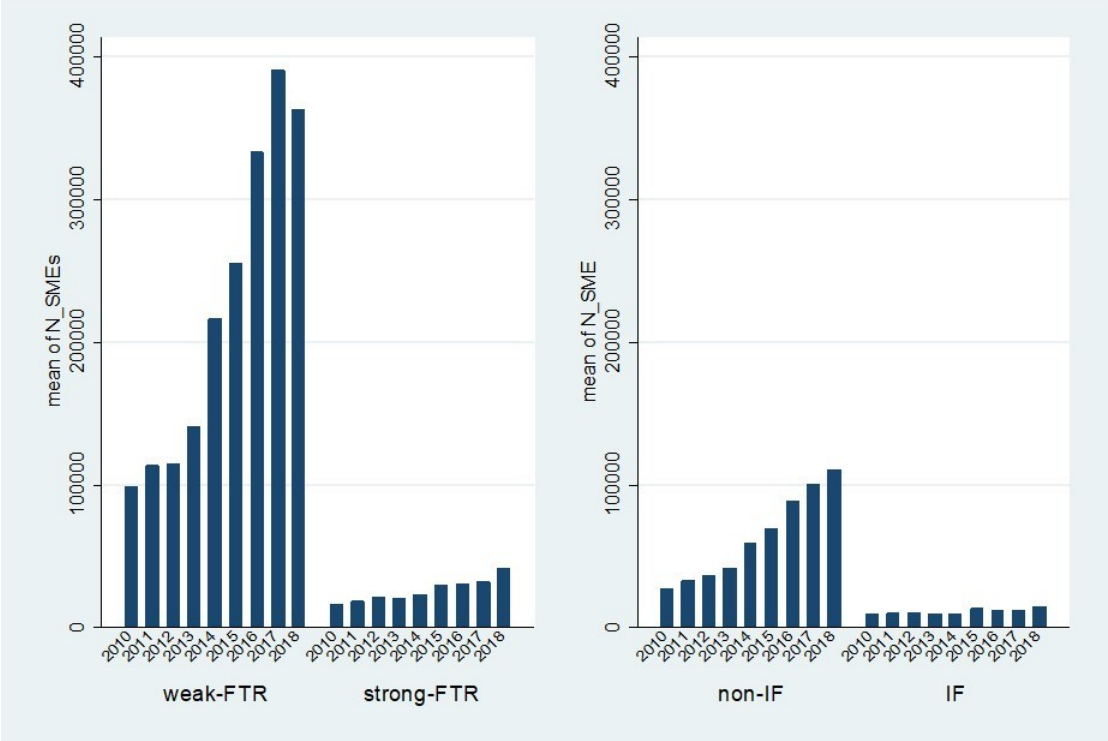

Table 1.2 presents the country-year descriptive statistics. And the pairwise correlation is reported in Appendix 1.3. In total, the sample should have 1,233 country-year observations, covering 137 countries over 9 years. As I include countries even when they had only one year with records, there are about 273 missing observations in newly created SMEs. The missing observation of IF is due to three countries where there is more than one majorly spoken language. The mean of IF indicates that the languages in the sample are almost equally divided. The mean of FTR is around 0.86, suggesting that there are more countries where the majorly spoken language conveys a strong preference to the present time in the sample.

The last column shows the p-value of the different-in-mean in corresponding variables between the intense perception of uncertainty (IF) and weak perception of uncertainty (non-IF) countries. The p-value of difference in means (last column in Table 1.2) indicates a significant difference in the number of SMEs created among countries with an intense perception of uncertainty and those with a weak perception of uncertainty. Also, a significant difference exists in the measurement of future orientation, suggesting that the measure of uncertainty perception (IF) does not overlap with the preference to the present (FTR).

[Table 1.2 about here]

1.4.2 Empirical Results

Table 1.3 reports the panel Tobit regression results using 134[17] country-level data from 2010 to 2018. First, only the year fixed effects were included in Model (1). The result shows that intense perception of uncertainty, measured by IF, is negatively related to entrepreneurial propensity. The relationship holds after controlling for macro socioeconomic variables in Model (2) and further controlling for entrepreneurial ecosystem variables in Model (3). Specifically, intense perception of

[17] There are three countries that will be run separately since multiple majorly spoken languages. These countries are Belgium, Switzerland, and Bosnia and Herzegovina.

uncertainty decreased the number of SMEs by 16 times ($e^{2.780}$) without controlling variables and around 8.9 times ($e^{2.182}$) after controlling all variables.

Mode (4) reports that FTR decreases the new venture creation, suggesting that the entrepreneurial propensity in countries where the majorly spoken language has strong-FTR than those with weak-FTR. However, this effect is not significant. And in Model (5), the results indicate that weak uncertainty perception and weak future preference language (LANG1) has increased the number of SMEs by eight times, compared to other categories of languages, while intense uncertainty perception and weak future preference language (LANG3) reduced the number of SMEs by six times (Model (7)).

After controlling both macro socioeconomic and entrepreneurial ecosystem variables, I performed multicollinearity using variance inflation factors (VIFs) to test if multivariate multicollinearity is an issue. The VIFs of all variables were below seven. The VIFs of variables of interest (IF, FTR, LANG1, LANG2, and LANG3) are below 2, which is below the critical value threshold of 10 (Hechavarría et al., 2018). Accordingly, multicollinearity does not affect the interpretation of the results.

Overall, these results support Hypothesis 1 that there are fewer newly established SMEs when the majorly spoken official language has IF (meaning intense perception of uncertainty). However, since the coefficient of FTR is positive but insignificant, Hypothesis 2 is not supported in either way. As stated, the effect of FTR on entrepreneurial propensity is vague and not found in the results. For the countries where the majorly spoken official language is strong FTR and used IF to construct the future tense, the country-level entrepreneurial propensity is reduced substantially, as in Hypothesis 3.

[Table 1.3 about here]

Table 1.4 reports the results obtained from Poisson regression with the raw regional number of SMEs in Belgium, Switzerland and Bosnia and Herzegovina. I controlled for the fixed effect of region, year, and interaction terms. The Belgian Wallon region, where the prevalently spoken official language is French, has 64% (IRR equals 0.36)

fewer SMEs created than Flemish regions, namely Dutch spoken region. Similarly, the Swiss regions where the majorly spoken language is French and Italian have around 60% (IRR equals 0.396) fewer SMEs created than German-speaking regions. In Bosnia and Herzegovina, the Serbian spoken region has 24% fewer SMEs created than the Bosnian and Croatian spoken regions.

[Table 1.4 about here]

Only is the effect of IF investigated at the regional level because FTR in the studied regions is collinear with IF. In this case, the effect includes both IF and FTR. It is to say that language that conveys the intense perception of uncertainty, and weak future orientation has diminished the number of SMEs at the regional level. These results support Hypothesis 1 and 3 that IF and strong FTR and IF languages negatively affect regional new venture creation within the same country despite regional characteristics.

1.5 Robustness Check

1.5.1 Cultural Dimensions

The linguistic features of interest in this study measure two aspects of cognition: perception of uncertainty and future orientation, proximate to uncertainty avoidance (henceforth, UA), and long-term orientation (henceforth, LT) in Hofstede's 6D Model of national culture. To confirm that the results are robust to the cultural effects, I controlled these two aspects of culture.

In addition, Power Distance (PD), Individualism (IDV) and Masculinity (MAS) were controlled because of the prior evidence that overconfidence and masculinity affect entrepreneurship and new venture creation (Bogatyreva et al. 2019; Mitchell et al., 2000). The robustness test results are shown in Table 1.5.

I confirmed the consistent results, showing that the intense perception of uncertainty proxied by IF is significantly and negatively related to the number of SMEs created. However, the uncertainty avoidance index from Hofstede shows insignificant and

positive effects. Moreover, it is worth noting that culture dimension indices had missed a considerable number of countries.

Hence, this robustness test also highlights the importance of using linguistic features, which are more observable or measurable, to delegate certain aspects of individual conception toward the world. It further provides the implications that language should not be merely considered a subordinate aspect of culture (Santacreu-Vasut et al., 2014). The proxy of uncertainty perception is robust to the effect of culture on entrepreneurial activities.

[Table 1.5 about here]

Moreover, the measurement of weak future orientation (strong FTR) has a weakly significant and negative relationship with entrepreneurial propensity. It implies that strong future orientation depresses the building of a prosperous entrepreneurial society. The finding corroborates the implication of Chi et al. (2020) that strong FTR speakers perceive the present value of a future reward as smaller, which leads to a lower level of engagement in the investment that brings benefits in the future.

This relationship is also shown with respect to the constantly positive relationship between Hofstede's long-term orientation index and the nationwide entrepreneurial propensity. In the unreported analysis, such a relationship between long-term orientation and entrepreneurial propensity also exists, suggesting FTR can be a significant informal institution linked with culture through the time perspective.

In addition, a positive relationship is observed between LANG2 and the number of newly created SMEs, which is as expected as the weak FTR and non-IF language speaking countries have a weak perception of uncertainty and are more future-oriented. Meanwhile, LANG3 spoken countries consistently have a negative coefficient, suggesting the negative effect of IF compared to LANG1.

1.5.2 Alternative measurement of legal origins

I re-ran the Tobit regression to test the robustness of IF. The binary variable of civil law in primary regression is replaced with four indicator variables for legal origins (British, French, German, and Scandinavian legal origin) based on LaPorta, Lopez-de-Silanes, and Shleifer (2008) (Table 1.6). The robustness tests concerning IF, FTR and indicator variables are also tested and presented in Appendix 1.4.

The results are consistent with earlier findings that the negative effect of intense perception of uncertainty, proxied by IF, on nationwide entrepreneurial propensity is robust, even controlling for different origins of the country's legal system. A negative relationship is also detected between strong FTR and IF (LANG3) and nationwide entrepreneurial propensity.

[Table 1.6 about here]

1.5.3 Alternative measurement of nationwide entrepreneurial propensity

Even though the population was controlled in the main regression, concerns may still arise regarding the labour force population. Thus, I used an alternative measurement, the density of new business entry (NBD) at the country level, to test the entrepreneurial propensity (Table 1.7). By the given definition, NBD is calculated based on the population aged from 15 to 64. I collect these data between 2010 and 2018 to be the dependent variable. The density is a non-negative observation and censored on the right at 32, meaning 32 new registered corporations given the working-age population. I applied Tobit regression and excluded the population in the control variable to eliminate the issue of endogeneity.

The robustness test indicates that the NBD of IF-speaking countries is approximately 2 units fewer than that of non-IF countries. In other words, given the same population of potential entrepreneurs, countries with the intense perception of uncertainty have

two fewer SMEs created per 1,000 working-age people than those with the less intense perception of uncertainty. As a reminder, the average of NBD is about 4, so the 2-unit difference should be considered significant when interpreting. This relationship is consistent with the previous empirical results. Meanwhile, the intense perception of uncertainty and weak future preference language (LANG3) remains a significant and negative effect on entrepreneurial propensity.

[Table 1.7 about here]

1.5.4 Subsample robustness check

Lastly, I conducted the subsample robustness check by dividing samples into two periods, 2010-2014 and 2015-2018 (Appendix 1.5). It is to consider the impact of the financial crisis in 2008 and the recovery time of the global economy. The results support the negative relationship between the intense perception of uncertainty (IF) and the number of SMEs created. Also, the negative effect of strong FTR and IF language (LANG3) on entrepreneurial propensity remains.

1.6 Discussion

This study provides additional evidence for the effect of perception of uncertainty on entrepreneurial propensity and the relevance of linguistic relativity theory in economic behaviour. The results imply the significance of considering the linguistic features and future tense construction in a language when developing a theory about risk appetite differences in entrepreneurial activity. It is to say that the future tense equipped with or without inflectional morphology may shape speakers' cognition concerning the perception of uncertainty and further their behaviour of engaging in entrepreneurial activity.

Two aspects of linguistic features used in constructing the future tense, namely inflectional future and future time reference, are explored. Based on the conjecture, the difference in perception of uncertainty and the preference to present time explain

the entrepreneurial propensity across countries and regions. Intense perception of uncertainty discourages venture creation and further reduces entrepreneurial propensity. Especially when the language uses the future tenses more frequently, the stimulation on the difficulties of making decisions and the expectation of higher rewards should also be more frequent, leading to the most intense perception of uncertainty.

The findings are consistent with preceding studies concerning the effect of language on how individuals perceive the future (Chi et al., 2020) and deliver novel evidence that the morphological way of constructing future tense depresses the entry of entrepreneurs and discourages the creation of SMEs. Consequently, the inflectional future tense may advance our understanding of persistent risk attitude in entrepreneurial activity across countries, regions and time. One implication for policy is that governments should consider reinforcing entrepreneurship education in universities or communities and encouraging non-morphological equipped language education and practice intended to promote entrepreneurial propensity.

Admittedly, although I controlled for a number of important socioeconomic and business environment factors, this study is limited to examining the effect of the inflectional morphology on the individual level on their decision to create new ventures. Secondly, it did not distinguish the potential variations within the category of inflectional morphology for future tense. For future research on this subject, one should measure inflectional future frequency in daily use and if the morphology is prefix or affix.

Both findings and limitations of this paper still highlight several potential directions for future studies. From the policymaking perspective, future research could investigate if changing the language from IF to non-IF impacts an individual's entrepreneurial propensity. And from the perspective of entrepreneurship, prospective research could be extended to examine the effect of linguistic features on entrepreneurship by collecting individual-level data in countries and regions where

multiple official languages are spoken or where there is a great deal of multilingualism population. Also, the proxy for the perception of uncertainty is a stable linguistic feature and is barely missing. It should act as a supplementary factor alongside culture.

1.7 Conclusion

Entrepreneurship involves a great deal of uncertainty. Creating a new venture is determined by the macroeconomic environment, policy, individuals' human and financial resources, and their psychological traits and perception of uncertainty. By examining the number of newly established and individual-owned SMEs in 137 countries, this study initiatively explores and provides evidence with regard to whether the perception of uncertainty, which is conveyed in the way of constructing the future tense, has influenced variations of cross-country and cross-region entrepreneurial propensity.

This study contributes to both behavioural economics and entrepreneurship. It demonstrates that inflectional future tense used in languages stimulates the intense perception of uncertainty and is, thus, negatively related to country- and region-level entrepreneurial propensity. It implies that intense perception of uncertainty decreases individuals' risk-taking behaviour, i.e. engagement in creating new ventures. Even though this study may be limited to the binary measurement of uncertainty perception, it advances our knowledge of the linguistic relativity hypothesis, suggesting that linguistic features affect human behaviour and decision making. Also, it emphasizes the need to integrate linguistic structures into studies of cross-country and cross-region entrepreneurship and investment.

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Table 1.1 Construction of linguistic feature variable, underlying meanings and language examples

Linguistic Feature	Category	Meaning	Examples in sample
Non- inflectional morphology used for the future tense and Strong FTR	LANG1	Weak perception of uncertainty and weak future-oriented behaviour	English/Bulgarian/ Romanian/Greek
Non- inflectional morphology was used for the future tense and Weak FTR, and if missing from Chen (2013), but non-inflectional morphology was used for the future tense	LANG2	Weak perception of uncertainty and strong future-oriented behaviour	Dutch/German/ Finnish/Swedish/ Icelandic*
Inflected future morphology and Strong FTR, and if missing from Chen (2013), but inflectional morphology used for the future tense exists	LANG3	Intense perception of uncertainty and weak future-oriented behaviour	French/Spanish/Slovenian/Italian/ Portuguese/Irish/ Lithuanian/Serbian**
Inflected future morphology and Weak FTR	LANG4	Intense perception of uncertainty and strong future-oriented behaviour	Brazilian Portuguese[18]
Note: * Icelandic is missing from Chen (2013) FTR ratio table; **Serbian is missing from Chen (2013) FTR ratio table.			

[18] Brazil Portuguese is the only language which has IF but weak FTR. It makes that Brazil is the sole country in this category of language, therefore, the regression results are not reported with respect to LANG4 category.

Table 1.2 Descriptive Statistics

This table represents the descriptive statistics of interested and control variables. The number of observations is on the country-year level. The p-value in the last column reports the p-value of difference in means of corresponding variables between IF and non-IF countries.

Variable	N	mean	SD	min	p50	p95	max	p-value
Ln (N_SMEs)	960	6.166	3.990	0.000	7.215	11.500	15.089	0.000
IF	1206	0.507	0.500	0.000	1.000	1.000	1.000	
FTR	648	0.861	0.346	0.000	1.000	1.000	1.000	0.000
LANG1	1206	0.269	0.443	0.000	0.000	1.000	1.000	0.000
LANG2	1206	0.231	0.422	0.000	0.000	1.000	1.000	0.000
LANG3	1206	0.493	0.500	0.000	0.000	1.000	1.000	0.000
LANG4	1206	0.007	0.086	0.000	0.000	0.000	1.000	0.003
ln_pop	1233	9.194	1.867	3.325	9.192	12.000	14.147	0.000
GDP_PPP	1168	21926.470	21484.530	663.055	14725.910	60368.920	141635.000	0.001
GDP_growth	1181	3.546	5.715	-62.076	3.507	8.426	123.140	0.478
Unemployment	1179	8.249	5.902	0.110	6.700	20.220	32.020	0.494
HDI	1188	0.725	0.155	0.375	0.754	0.927	0.954	0.000
EDB	1131	62.957	12.875	19.980	63.600	82.700	91.710	0.000
Civil_law	1116	0.734	0.442	0.000	1.000	1.000	1.000	0.000
Fin_access	475	2.553	0.420	1.260	2.510	3.310	3.710	0.001
Gov_support	475	2.580	0.499	1.260	2.540	3.480	4.550	0.056
Tax_bureau	475	2.417	0.558	1.280	2.380	3.390	4.180	0.000
Gov_program	475	2.642	0.498	1.340	2.620	3.480	3.750	0.836
Basic_training	475	2.019	0.428	1.140	2.000	2.790	3.670	0.000
Post_training	475	2.828	0.375	1.500	2.830	3.440	3.950	0.070
Rd_transfer	475	2.391	0.390	1.170	2.380	3.070	3.730	0.003
Commerce_infra	475	3.005	0.365	1.260	3.010	3.620	3.900	0.035
Internal_dynamic	475	3.042	0.503	1.780	3.030	3.960	4.350	0.000
Internal_openness	475	2.567	0.368	1.290	2.550	3.210	3.730	0.000
Physic_infra	475	3.772	0.465	2.100	3.850	4.460	4.820	0.006
Cultural_norms	475	2.827	0.513	1.620	2.850	3.760	4.400	0.148
NBD	912	3.930	4.968	0.028	1.861	15.075	32.437	0.000

Table 1.3 Results of Random Effects Using Tobit Regression for the Effect of Uncertainty Perception on Entrepreneurial Propensity

This table represents the results of Tobit regression with the left censor at 0. The dependent variable is the natural logarithm of the number of SMEs at the country level recorded on Orbis from 2010 to 2018, and the interested variables are IF and FTR. Unreported macro control variables are GDP PPP, GDP growth, unemployment, the natural logarithm of the total population (Ln_pop), the human development index (HDI), scores of ease of doing business (EDB), and the indicator variable of civil law (Civil_law). Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Model (5), (6) and (7) show the regression results with the indicator variable for linguistic feature category (IF and FTR). Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IF	-2.780***	-2.165***	-2.182**				
	(0.948)	(0.751)	(0.860)				
FTR				-1.165			
				(1.279)			
LANG1					2.160**		
					(1.027)		
LANG2						-0.025	
						(1.011)	
LANG3							-1.853**
							(0.878)
Constant	5.843***	-9.974***	-10.903**	-13.164*	-13.531***	-12.464**	-10.667**
	(0.704)	(2.981)	(4.814)	(6.763)	(4.855)	(5.039)	(4.925)
Macro Control variables	NO	YES	YES	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	NO	NO	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES
Observations	933	813	381	265	381	381	381
Number of groups	134	117	75	49	75	75	75
Wald chi2	32.16	109.81	51.25	45.86	48.10	42.03	48.58

Table 1.4 Results of Poisson Regression for the Effect of Uncertainty Perception on Regional Entrepreneurial Propensity within a Country

This table represents the results of Poisson regression. The dependent variable is the number of SMEs recorded in the Belgian Wallon and Flemish region, Swiss regions where the prevalently spoken official languages are French, German and Italian, and two regions (Federation of Bosnia and Herzegovina and Republika Srpska) in Bosnia and Herzegovina from 2010 to 2018. The interested explanatory variable is the perception of uncertainty, proxied by IF. The coefficients reported are incident rate ratios (IRR). Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

	Belgium	Switzerland	Bosnia and Herzegovina
IF	0.360***	0.396***	0.762***
	(1.77e-10)	(1.25e-12)	(3.11e-10)
Constant	342***	7020***	63***
	(1.17e-13)	(1.33e-12)	(2.56e-08)
Region#year	YES	YES	YES
Region fixed effect	YES	YES	YES
Year fixed effect	YES	YES	YES
Observations	18	198	18

Table 1.5 Robustness test with cultural dimensions

This table represents the results of using Tobit regression for panel data as the primary regression. It reports the robustness test of linguistic features by including Hofstede's cultural dimension in the primary regression on the country level. The dependent variable is the natural logarithm of the number of SMEs recorded on country-level on Orbis from 2010 to 2018.
Model (1) and (2) regress IF and FTR with the Hofstede index, including UA, LT, PD, IDV, and MAS. Three indicator variables of the category of language are regressed with culture dimension indices in Model (3), (4), and (5). Unreported macro control variables are GDP PPP, GDP growth, unemployment, the natural logarithm of the total population, the human development index, scores of ease of doing business and the indicator variable of civil law. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)	(5)
IF	-4.328***				
	(1.637)				
FTR		-4.115*			
		(2.342)			
LANG1			0.184		
			(2.221)		
LANG2				4.761*	
				(2.643)	
LANG3					-3.236**
					(1.622)
UA	0.038	0.118	0.000	0.062	0.031
	(0.059)	(0.083)	(0.066)	(0.069)	(0.062)
LT	0.070*	0.095***	0.103**	0.099***	0.083**
	(0.036)	(0.031)	(0.040)	(0.035)	(0.037)
PD	-0.019	-0.026	-0.003	0.013	-0.013
	(0.062)	(0.082)	(0.073)	(0.066)	(0.065)
IDV	0.042	0.098**	0.033	0.058	0.036
	(0.047)	(0.044)	(0.054)	(0.051)	(0.049)
MAS	0.008	0.001	0.012	0.031	0.011
	(0.043)	(0.048)	(0.049)	(0.046)	(0.044)
Constant	-3.639	4.200	-1.779	-18.935	-2.196
	(9.186)	(14.200)	(14.342)	(15.606)	(12.611)
Macro Control variables	YES	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES
Observations	153	128	153	153	153
Number of groups	25	20	25	25	25
Wald chi2	56.30	72.65	47.48	51.61	52.80

Table 1.6 Robustness test with alternative measurements of legal origins

This table represents the results of Tobit regression for panel data. The dependent variable is the natural logarithm of the number of SMEs recorded on country-level on Orbis from 2010 to 2018. The indicator variable of civil law is replaced by four indicator variables, namely the British (UK_law), French (FR_law), German (GE_law), and Scandinavian (SC_law) in Model (1), (2), (3) and (4), respectively. Unreported macro control variables are GDP PPP, GDP growth, unemployment, the natural logarithm of the total population, the human development index, and scores of ease of doing business. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)
IF	-2.182**	-1.577*	-1.693**	-2.010**
	(0.860)	(0.917)	(0.809)	(0.681)
UK_law	-1.184			
	(0.995)			
FR_law		-0.860		
		(0.967)		
GE_law			2.770***	
			(1.034)	
SC_law				-0.843
				(1.771)
Constant	-9.719**	-9.417*	-9.546**	-10.160**
	(4.764)	(4.804)	(4.570)	(4.743)
Macro Control variables	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Observations	381	381	381	381
Number of groups	75	75	75	75
Wald chi2	51.25	51.02	59.46	50.15

Table 1.7 Robustness test with alternative measurement of entrepreneurial propensity

This table represents results of Tobit regression for panel data by regressing IF and FTR, and language category, on alternative measurement of entrepreneurial propensity, the density of small business entry (NBD) at the country level. The feature of the dependent variable is non-negative and censored at 32. The left and right censors are at 0 and 32. Note that the natural logarithm of the total population is excluded from this regression. Therefore, unreported macro control variables are GDP PPP, GDP growth, unemployment, the human development index, scores of ease of doing business, and civil the indicator variable of civil law. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)	(5)
IF	-2.430**				
	(1.033)				
FTR		-0.719			
		(1.391)			
LANG1			0.446		
			(1.208)		
LANG2				1.874	
				(1.188)	
LANG3					-1.821*
					(1.067)
Constant	-8.235*	-8.668	-10.969**	-9.502**	-8.845**
	(4.261)	(6.389)	(4.277)	(4.261)	(4.318)
Macro Control variables	YES	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES
Observations	363	249	363	363	363
Number of groups	70	45	70	70	70
Wald chi2	113.81	87.38	106.09	109.73	110.09

Chapter 2

High-growth entrepreneurs: habitual entrepreneurs and founding team composition

The work presented in this chapter is co-authored with Armin Schwienbacher*.

We study whether the founding team composition of novice entrepreneurs help predict whether they become high-growth entrepreneurs. We track a fully random sample of 1,000 first-time entrepreneurs over their first ten years of activities. Taking an entrepreneurial level perspective, we find that team composition in the very first company matters for the likelihood of entrepreneurs ultimately experiencing high-growth status. More co-founders help finance these increased assets with less leverage and less equity from the entrepreneur, suggesting that these co-founders bring in more equity finance and reduce the need for debt finance. We further find that non-family members participating as business partners in the very first company of the entrepreneur help them become habitual, but not family members. As evidenced in our data, this last finding is consistent with non-family members being more experienced. High-growth entrepreneurs are often habitual entrepreneurs (even when controlling for possible reverse causality), and a significant part of their asset growth comes from their first company. Finally, we run the analysis at the company level and obtain partially different results, which highlights the need to choose the level of analysis well.

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* Armin SCHWIENBACHER, SKEMA Business School, Avenue Willy Brandt, 59777 Euralille (France), email: armin.schwienbacher@skema.edu.

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2.1 Introduction

Entrepreneurs contribute significantly to the economic activities and job creation of a country (see, e.g., Haltiwanger, Jarmin, and Miranda, 2013, and Malchow-Møller, Schjerning, and Sørensen, 2011). High-growth (sometimes also called 'scale-up') entrepreneurs are of particular interest in this respect and gain increasing attention from policymakers and academics (Shepherd and Patzelt, 2020), given their magnified impact on the economy (McKelvie and Wiklund, 2010). However, entrepreneurs are not a homogenous group of individuals. They differ in their prior experience, aspirations and ambitions, making it difficult to identify high-growth entrepreneurs. It is crucial to identify them early on in the entrepreneurial process, and support them, including appropriate public policy measures.

Another pressing question in the context of policy support is the distinction between high-growth companies and entrepreneurs, as these may not entirely overlap. While most studies focus on high-growth companies (Autio & Rannikko, 2016; Azoulay et al., 2020; Dwyer & Kotey, 2016), it is equally important to focus on high-growth entrepreneurs since many run a portfolio of companies. The latter helps understand how they structure their entrepreneurial activities beyond considering a single company only. In fact, entrepreneurs adopt different strategies to develop and manage their corporate activities[19]. While some work on growing a single company, others use a portfolio strategy of multiple legally separate companies but run simultaneously. Others again become serial entrepreneurs (Ucbasaran et al., 2006; Carbonara et al., 2020). These different approaches make it hard to compare entrepreneurial decisions and performance, which is typically measured in academic research at the company

[19] Existing literature typically distinguishes between three types of entrepreneurs: single, portfolio, and serial entrepreneurs (Westhead and Wright, 1998, 2015; Ucbasaran et al., 2008). Single entrepreneurs are those that set up a single company to develop corporate activities in his/her lifetime. Serial entrepreneurs start companies sequentially, moving to a new one while leaving the former (which may have either failed or was sold successfully). In contrast, portfolio entrepreneurs run multiple companies simultaneously. The last two types are also labelled "habitual" entrepreneurs (Westhead and Wright, 1998). The entrepreneurship literature often refers to novice entrepreneurs also, which are first-time entrepreneurs. We do not use this term here, since all our entrepreneurs are initially first-time entrepreneurs (and thus novice) in our sample.

level (Basu, 1998; Parker and Van Praag, 2006; Baron, 2007; Hmieleski and Baron, 2009; Zhao, Seibert, and Lumpkin, 2010). To facilitate the comparison, we examine different paths taken by entrepreneurs to investigate their entrepreneurial decisions and outcomes at the entrepreneur level. We particularly aim at shedding light on the early identification of high-growth entrepreneurs and their strategy to grow their activities. As mentioned by McKelvie and Wiklund (2010), the question of growth mode ("how?") is at least as important as the one of growth rate ("how much?"). This study focuses on the former question in the context of first-time entrepreneurs.

An important factor that affects the development of entrepreneurial activities is the team composition and team size when the first start-up is created. The initial team composition and size allow considering the amount of expertise and resources and the existing personal relationship (e.g., family relationships) of involved co-founders (Ko, Wiklund, and Pollack, 2021). As yet, the impact of initial founding team composition and size on the organizational strategy that entrepreneurs adopt remains largely unexplored, especially for first-time entrepreneurs. Our analysis at the entrepreneurial level allows complementing this strand of literature by investigating the impact of family ties in these nascent ventures on the entrepreneur's long-term "career" as an entrepreneur. In doing so, we shed light on how entrepreneurial founding teams affect the life cycle of entrepreneurial ventures (Patzelt et al., 2020).

To perform our analysis, we collected a random sample of 1,000 U.K. entrepreneurs using registry data of first-time entrepreneurs in 2010, which we then tracked until 2019. Thus, all entrepreneurs in our sample were nascent entrepreneurs in 2010. We gathered information on entrepreneurs' demographics, their prior managerial experience (without being an owner) in other companies they have worked for before, and all the companies they owned and managed, founded or co-founded during the first ten years. We further collected data on the year of incorporation, ownership structure, founders, location, industry, capital structure and total asset for each sampled company in each year until 2019 (or earlier if liquidated or sold before). This method of data collection allows us to categorize entrepreneurs into three categories:

single entrepreneurs (who started their first company in 2010 and did not start any new venture afterwards during ten years), serial entrepreneurs (who held at least two companies sequentially over time, with possibly an overlap of no more than 2 years), and portfolio entrepreneurs (who held at least two companies at the same time during at least 2 overlapping years). The latter two categories further compose habitual entrepreneurs. Such categorization enables us to obtain outcomes measures after ten years of entrepreneurial activities. We calculated the assets managed by each entrepreneur at the end of the ten years (the average managed assets between 2017 and 2019) and the way these assets are owned and financed.

Our sample comprises 70% of single entrepreneurs and 30% of habitual entrepreneurs (25% portfolio and 5% serial entrepreneurs). The median entrepreneur is 40 years old, has no prior managerial experience, and two-thirds of entrepreneurs in our sample are men. The average survivorship ratio by year for all entrepreneurs is lower than the survivorship ratio of the sample of companies started in 2010, which is mostly driven by single entrepreneurs. It means that for single entrepreneurs, the firms they founded (or co-founded) live on average longer than the time of stay as entrepreneurs, because some sell their business successfully and are then run by someone else for more years. Thus, this observation is as expected for single entrepreneurs. The opposite holds, however, for habitual entrepreneurs, who generally stay longer in business as an entrepreneur than the firms they founded the first time. Indeed, they remain entrepreneurs often longer than their first company, since they continue starting new companies over time. While these observations are intuitive, they highlight the importance of considering the entrepreneurial level of outcome analyses. In addition, we document a strong positive correlation between the fact that an entrepreneur ends up in the top quartile in terms of assets managed and the growth of the very first company started in 2010. These companies are owned and managed by 16% habitual entrepreneurs and 21% single entrepreneurs.

In terms of founding team composition in the first company when becoming an entrepreneur, we find strong diversity across the full sample of entrepreneurs, but no

meaningful difference across entrepreneurial types. Moreover, the median entrepreneur starts his/her new career with one co-founder, which half of the time is a family member, and the other half is not from the same family.

We then perform several multi-variate analyses. As a first step, we study the factors affecting the entrepreneurial path to becoming a habitual entrepreneur. We find that individuals who enter entrepreneurship later in their life (thus being older), women, and individuals with little managerial experience are less likely to become habitual entrepreneurs. These results are mostly driven by portfolio entrepreneurs, as we find only limited differences among these factors between serial and single entrepreneurs. These results are consistent with the common view in the entrepreneurship literature that younger individuals and men are less risk-averse. The previous experience helps gather and analyse information, identifying and exploiting opportunities to make more informed decisions (Forbes, 2005; Baron and Ensley, 2006; Acedo and Florin, 2007; Gruber, Kim, and Brinckmann, 2015). In terms of initial founding team composition, we find that the participation of non-family co-founders positively affects the likelihood of becoming habitual entrepreneurs, unlike family co-founders that have no impact. Further analysis indicates that non-family co-founders are more experienced, which may explain this differential impact. Still, the difference remains even when controlling for co-founders' experience, suggesting other factors such as resource availability may be at play.

We then examine the outcomes of the different paths in the last years at the entrepreneurial level to see whether these factors induce entrepreneurs after ten years to manage more assets and finance these larger assets with more leverage. Also, we explore the overall ownership structure, as we conjecture that portfolio entrepreneurs (part of habitual entrepreneurs) may own less in each company than single entrepreneurs. Moreover, more co-founders ensure more resources are available to begin with, and thus different financing means. We aggregate the different outcome measures at the entrepreneurial level to make this comparison possible. For instance,

we add up the total assets of all companies held by the habitual entrepreneur at the end of the sample period.

Similarly, we calculate the average ownership and weighted corporate leverage ratio in all these companies. It enables us to obtain an entrepreneur-level perspective instead of a company-level one. To avoid the concern that 2019 may be a particular year, we use the average of the last three years, 2017-2019. We find that co-founders enable reduce overall leverage at the entrepreneurial level. Interestingly, while assets managed is higher, the amount of assets personally owned by the entrepreneur is not affected by co-founders. We find that habitual entrepreneurs manage more assets, while their leverage ratios are not significantly higher than single entrepreneurs. When splitting habitual into the two previous groups, we find no meaningful difference between serial and single entrepreneurs. Rather, the difference discussed for habitual entrepreneurs is fully attributable to portfolio entrepreneurs. Thus, serial entrepreneurs are fundamentally not different after ten years of activities than single entrepreneurs. Only those developing a portfolio strategy are, mainly in terms of assets managed.

Finally, we run the same analysis but at the company level, more consistent with the existing literature, in order to highlight the importance of choosing the right unit of analysis. When taking the company level, habitual entrepreneurs have fewer assets under management and own fewer assets after ten years. Such a conclusion is not only the opposite of what we obtained at the entrepreneurial level, but also inconsistent with what one would expect. Rather, these results simply indicate that individual companies of habitual entrepreneurs are smaller. Still, we cannot infer anything about the entrepreneurs themselves. While individual companies are smaller, habitual entrepreneurs own and manage more assets after ten years than single entrepreneurs. These additional findings suggest that both units of analysis are essential and complementary.

Our study offers several contributions to the academic literature. First, we contribute to the literature on high-growth entrepreneurship by investigating entrepreneurs' characteristics (Audretsch, 2012; Azoulay et al., 2020; Baum et al., 2001; Baum and Locke, 2004). Responding to the limited empirical studies in characteristics of highly successful entrepreneurs (Azoulay et al., 2020), our study identified founding team composition as a novel feature associated with successful novice entrepreneurs. Also, it explores the development path of high-growth entrepreneurs rather than that of companies (Eisenhardt & Schoonhoven, 1990; Lechner & Dowling, 2003). By doing so, it helps novice entrepreneurs to identify growth strategies and grow their wealth.

Second, our work contributes to better understanding determinants of habitual entrepreneurship through our distinct perspective. To begin with, our empirical approach is unique compared to other studies based on survey data (e.g., Westhead and Wright, 1998; Fu, Larsson and Wennberg, 2018). It may also explain why we obtain different results. Survey data offer an insightful picture of entrepreneurial type at some point in time, while we measure it over the first ten years of entrepreneurial experience of individuals randomly drawn from the full universe of company registrations. This empirical setting has several advantages. First, it offers an unbiased sample of entrepreneurs, which is not guaranteed with survey data. Moreover, it offers the possibility to classify entrepreneurial types more objectively (while survey data are typically self-reported). It further allows observing the full range of complex paths entrepreneurs take over time. Finally, we are able to construct a much larger sample based on specific filters applied to obtain the needed sample for our tests. In our case, to facilitate comparison across entrepreneurs, we only consider individuals who became entrepreneurs for the first time in 2010 in the United Kingdom, which offers a more comparable sample of individuals, and allows us to track them until the end of 2019. Adopting a different empirical approach allows us to contribute to that literature strand by studying, for the first time, the impact of initial founding teams on the choice of becoming habitual entrepreneurs, whether it is a portfolio or serial entrepreneur. In particular, our study offers empirical support to some theory papers

that derived a positive relationship without empirically testing it. We further provide large-sample size support for the conclusions of Iacobucci and Rosa (2010) that were made with case studies. A unique factor that we are the first to study is the entrepreneurial experience of co-founders in the initial founding team.

Third, we contribute to the literature on the importance of family ties in firms and family businesses more generally. This concern is particularly pressing given that according to Miller, Sterier and Le Breton-Miller (2016), family firms have drawn less attention from the field of entrepreneurship. Similarly, Zellweger and Sieger (2012) argued that entrepreneurship literature generally neglects the family relationship in the business context, and family business literature overlooks the entrepreneurial behaviour. We shed light on how entrepreneurial founding teams affect the life cycle of entrepreneurial ventures (Patzelt et al., 2020). We document that more non-family co-founders in the initial team lead more often to habitual entrepreneurship and tend to speed up the growth of entrepreneurial activities as a whole. This differential impact may be the result of several factors. Family firms are frequently criticized for their lower innovation (Block et al., 2013) and greater conservatism (Shepherd and Zahra, 2003). On the contrary, non-family co-founders tend to focus more on the growth of a new venture and have fewer such concerns. In addition, the fact that family businesses have longer-term horizon planning (Zellweger, 2007) makes decision-makers in family ventures more cautious in attempting to grow (Miller et al., 2016) and thus may take longer time to expand their business by creating subsequent venture(s). This, in turn, slows the growth of entrepreneurial activities as a whole.

The rest of the study is structured as follows. Section 2.2 present the relevant literature and the hypotheses we will test in our empirical analysis. Section 2.3 describes the data sources, the construction of the sample and presents summary statistics. Section 2.4 highlights the methodology that is used to test our hypotheses. All our empirical results are then summarized in Section 2.5. Different robustness

checks are listed and discussed in Section 2.6. Section 2.7 concludes and offers a discussion of implications.

2.2 Literature and Hypotheses Development

In this section, we first review the relevant literature. We then derive testable hypotheses on the impact of founding team composition on entrepreneurial outcomes (assets owned and managed by the entrepreneur, as well as financing outcomes) and ultimately the likelihood of becoming a high-growth entrepreneur.

The literature on habitual entrepreneurship remains limited[20], notably because of the difficulties in studying all three types of entrepreneurs at the same time. One exception is the work by Carbonara et al. (2020). The authors build an occupational choice model that they then calibrate on Vietnamese data. They find that a greater initial endowment of the entrepreneur (i.e., when he/she becomes entrepreneur) increases the chances of becoming habitual, since greater endowments facilitate the financing for additional activities and thus exploit new opportunities that arise in the future. Without sufficient endowments, these opportunities may not be pursued as easily. If they were, they would be more likely pursued within the current company. With larger endowments and teams, these new activities can be developed more easily in separate entities. While this speaks in favour of portfolio entrepreneurship, they predict a similar relationship for serial entrepreneurship. Indeed, greater endowment enables starting new activities more easily if the first one either failed or succeeded but was sold. While the authors interpret initial endowment in terms of entrepreneurial human capital, a larger interpretation that is consistent with their modelling includes human and financial capital brought by the initial team more broadly (in particular the co-founders, as we do in our analysis) and not just the entrepreneur himself/herself. A uniqueness of the model developed by Carbonara et al.

[20] One field of research in habitual entrepreneurs concern business groups (Iacobucci & Rosa, 2010), which is not directly related to novice entrepreneurs but to the different ways portfolio entrepreneurs organize links between the different companies. As this goes beyond the scope of our analysis, we do not explicitly discuss it here. However, Iacobucci and Rasa (2010) offer many insights through the discussion of case studies.

(2020) is that they are able to disentangle serial from portfolio entrepreneurs and not only derive predictions for habitual entrepreneurs[21].

Other studies shed light on comparing two out of three entrepreneurial types. Iacobucci and Rosa (2010) argue that strong entrepreneurial teams promote portfolio entrepreneurship because it gives the ability to grow outside the existing business unit by delegating management to other team members while securing an ownership stake in the newly created business. It further reduces the need to invest large amounts of own funds in the first business, since a larger entrepreneurial founding team constitutes a larger pool of financial resources to start with.

An important factor affecting entrepreneurial activities is the team composition and size when the first startup is created, since it allows considering the resources, competencies, and existing personal relationships (e.g., family relationships) of involved co-founders beyond the workplace (Ko, Wiklund, and Pollack, 2021)[22]. While the impact of different aspects of team diversity has an ambiguous effect on companies (Horwitz and Horwitz, 2007), family relationships appear to positively affect nascent ventures' productivity, as recently evidenced by Ko, Wiklund and Pollack (2021). They show that family links moderate negative effects of other team diversity factors. Whether this is the same for the likelihood of becoming a habitual and/or high-growth entrepreneur remains unexplored. Brinkerink and Rondi (2021) find that family firms tend to invest more in R&D spending, which they attribute to the informal institution of shared rules and identity that the family supports inside the business, especially when there is a lack of formal institutional property rights institutions. Here again, its impact on the organizational strategy that entrepreneurs adopt remains unexplored, notably since their analysis is done at the company level.

[21] The distinction between serial and portfolio entrepreneur is driven by skills in their model, so that entrepreneurs with greatest skills focus on only one business (thus becoming serial entrepreneur) while less skilled ones find extra opportunities in new businesses. However, this distinction is driven by the assumption of decreasing productivity in opportunities.

[22] We follow the definition of entrepreneurial team proposed by Lazar et al. (2020, p. 29), in that it is composed of "two or more individuals who pursue a new business idea, are involved in its subsequent management, and share ownership". Since its shared ownership is an integral part of this definition, we also use the term "co-founders" throughout the paper when referring to the persons as opposed to the group as a whole.

Our analysis at the entrepreneurial level allows complementing this strand of literature by investigating the impact of family ties in these nascent ventures on the entrepreneur's long-term "career" as an entrepreneur.

Entrepreneurial teams are at the heart of any new venture (Cooper and Daily, 1997). They are crucial for the success of a new venture (Lechler, 2001) and novice entrepreneurs. They may share and bring experience, complementary skills, financial resources and business contacts to entrepreneurs and the new venture(s) (West and Noel, 2009; Klotz et al., 2014). These co-founders may be family members or not. Ko et al. (2021) study entrepreneurial team diversity and find that age and gender diversity reduces team productivity, although family relations moderate these relationships. This may affect outcomes of habitual entrepreneurs also.

Cooper, Gimeno-Gascon and Woo (1994) suggest that the presence of co-founder(s) helps reduce the liability brought from small company size and newness. It is derived from the diversified skills, and financial resources brought by co-founder(s), meaning the competency being acquired by recruiting from outside (Kirschenhofer and Lechner, 2012). This may be particularly the case for non-family co-founders, who may be selected among a much larger pool of individuals and more likely due to their particular skills rather than family relationships. Even though adding new partner(s) in one company may dilute the entrepreneur's ownership in that entity, it does not necessarily impact habitual entrepreneurs' ownership over the business group. It has been found that portfolio entrepreneurs do not need to compromise their ownership of the overall business group to entrepreneurial teams and can still diversify the business under their control (Iacobucci and Rosa, 2010). Kolvereid and Bullvag (1993) state that the involvement of co-founders(s) may enable portfolio entrepreneurs to establish and own multiple businesses, compared to novice and serial ones.

Additionally, as additional co-founders vitally affect essential human capital and entrepreneurial/managerial knowledge (West and Noel, 2009), companies are more likely to succeed when they are owned and managed by an entrepreneurial team than

by a single entrepreneur (Kirschenhofer and Lechner, 2012). The experience of success from the initial company or companies tends to encourage entrepreneurs to explore new projects with the resources they had owned and networks they had built (McKelvie and Cedere, 2001). Thus, entrepreneurs who have started their careers as entrepreneurs with more co-founders are more likely to become habitual entrepreneurs.

Hypothesis 1: Entrepreneurs with more co-founders are more likely to become habitual entrepreneurs.

Potential overlap between family participation in businesses (so-called family businesses) and entrepreneurship had been studied extensively already in various contexts (Dyer and Handler, 1994; Brockhaus, 1994). Chrisman et al. (2003) point out that family plays a critical role and is an often-used resource for startups. Team formation and composition in a family business setting influence the founding conditions and practices of a new venture, as well as on the ventures' subsequent survival and development (Schjoedt et al., 2013). Family members' involvement in the initial team can be especially important when the entrepreneur has constrained social relationships to develop the business (Starr and Bygrave, 1991).

Aldrich and Waldinger (1990) observe that family member participation in ventures is crucial in acquiring and mobilising financial resources and providing human resources (Aldrich and Langton, 1998). While Renzulli, Aldrich and Moody (2000) report that the high proportion of family relatives in one's discussion network reduced the possibility of starting an individual's business due to the disadvantageous inward information sharing. The family member participation was also described as a source of conflict for entrepreneurs (Dyer and Handler, 1994). Lim and Suh (2019) pointed out that compared to family members, non-family members possess a skill set that the entrepreneur may not have, thus '*facilitating the division of labor between co-founders*' (p. 134). However, Dyer and Handler (1994) and Dyer (1992) note that the family members' willingness to contribute resources, managerial, financial and access

to other resources in initial venture creation, is a critical driver. With supportive family members, entrepreneurs are still more likely to have reduced burden at early and difficult phases, meaning that it is easier to share the initial costs and losses (Dyer and Handler, 1994). Apart from entrepreneurial teams, family participation in the initial company is hypothesized as a stimulus of continuing to create sequent companies.

Hypothesis 2: Entrepreneurs with more non-family members as co-founders in the initial company are more likely to become habitual entrepreneurs than entrepreneurs with family members.

With co-founder participation, the entrepreneur's ownership is expected to be reduced, though the proportion is uncertain. Although the ownership in each company is diluted, the resources brought by co-founders for new ventures are likely to be enriched. Given the positive relationship between the number of co-founders and productivity, we further predict that entrepreneurs with more co-founders initially will be able to finance activities with less debt (thus, lower leverage) and accumulate more assets, both in terms of the overall amount of assets to manage and personally owned by himself/herself:

Hypothesis 3: Entrepreneurs with more co-founders have lower personal ownership, lower overall corporate leverage and more assets to own and to manage.

A final analysis explores the importance of habitual entrepreneurs' first company in becoming high-growth entrepreneurs. This provides insights into the organization of entrepreneurial growth. The motivation of becoming a habitual entrepreneur is explored in extant studies (see the review in Westhead and Wright, 2015). When the first company growth is limited, entrepreneurs tend to create new companies to expand and support the first one (Donckels et al., 1987). It suggests that the growth of the first company determines the development of the entire entrepreneurial activity. As indicated in Wright et al. (1997), the monetary gain may become less important in subsequent ventures, because entrepreneurs may not want to put the wealth generated

from an earlier successful company at risk. Therefore, the growth of the first company in their beginning years may provide significant implications for the follow-up companies' growth, thereby being an important indicator to identify early on high-growth entrepreneurs. While there is no prior empirical study investigating the contribution of the first company's growth on becoming a high-growth entrepreneur, we derive the following novel hypothesis based on the theoretical discussion here:

Hypothesis 4: For habitual entrepreneurs, the asset growth of the first company offers a disproportionate contribution to the likelihood of becoming a high-growth entrepreneur.

3. Data and Sample Statistics

We collected the primary data from ORBIS. We first searched for companies that were corporate entities and established in 2010 in the UK with less than 50 employees. The legal forms that we considered were a sole proprietorship, private limited company, and partnership. Furthermore, we narrowed the sample by applying the criterion that the owners were individuals and managers in these companies. These criteria gave us 41,860 UK companies in 2010. We then randomly ordered the full list of companies. As a second step to obtain our final sample, we manually checked each company in the order as they appear in the random list, on whether the founder(s) were novices; i.e., it was the first company they founded in their lifetime. This allows us to obtain a sample of companies incorporated in 2010 by first-time entrepreneurs. We performed this manual check through the random list until we obtained a sample of 1,000 entrepreneurs. Given the randomness of the sample selection, this reduced sample constitutes a representative sample of the full population. At the same time, our final sample of 1,000 entrepreneurs is sufficiently large to ensure reliable statistical inference.

For each of the entrepreneurs in the sample, we tracked their entire entrepreneurial activities until 2019, including new company creation, company sales, and company liquidations. This tracking provided us with 804 initial companies in 2010 and 481

additional companies created between 2011 and 2019. These figures include subsidiaries of the parent company, regardless of whether the entrepreneur holds shares directly or indirectly through the parent company. Indirect subsidiaries amount to 31 additional companies (out of 481). In other words, our final sample of 1,000 entrepreneurs co-owned a total of 1,285 companies between 2010 and 2019. The fact that there were only 804 new companies in 2010 for 1,000 entrepreneurs is because some companies were created by several co-founders, and each was a novice. Then our sample included each of these co-founders as a novice entrepreneur.

To classify entrepreneurs, we constructed a dummy variable for habitual and single entrepreneurs, in which habitual entrepreneurs owned more than one company from 2010 to 2019 while single entrepreneurs owned only one. We further distinguished between portfolio and serial entrepreneurs by using two overlapping years as the minimum overlap to define a portfolio entrepreneur[23]. However, this analysis is only provided later as an extension; the main results are limited to the distinction between habitual and single entrepreneurs. We gathered each entrepreneur's demographic information: year of birth and gender. Also, we capture their managerial experience by a dummy variable which equals 1 if the entrepreneur had senior managerial positions in other companies before 2010 and 0 for otherwise. We consider that an entrepreneur had a senior management position when he/she were recorded in the ORBIS database as belonging to the 'senior managers' of companies, rather than being only as a 'member of the board of director'.

[23] More precisely, if an entrepreneur held more than one company between 2010 and 2019, and the number of overlapping years of ownership in these companies is equal to or more than 2 years, we classified them as portfolio entrepreneur; and if an entrepreneur held more than one company and the number of overlapping years is less than 2 years, we classify him/her as serial entrepreneur. The reason for the use and length of overlap is motivated by the fact that entrepreneurs require some time to sell their first company, and may already start a second before having sold it. Importantly, considering the few cases of entrepreneurs who created more than one company in 2010, we classified them all as portfolio entrepreneurs, even if the number of overlapping years is less than two years. As mentioned above, we also considered subsidiaries in the classification of entrepreneurs, even if the ownership of the entrepreneur into the subsidiary is only through the first, parent company (so "indirect ownership"). There, the criterion is still two years of overlapping, regardless it is a subsidiaries or parent company. For example, an entrepreneur who created a first parent company in 2010 and a subsidiary in 2014, and has held both of them until 2016, is classified as portfolio entrepreneur.

In addition, we counted both the number of family co-founders and non-family co-founders in entrepreneurs' first companies in 2010, including subsidiaries. Family co-founders are identified and recorded if they are listed as shareholders and have the same family name as the entrepreneur in company/ies in 2010. When an entrepreneur started more than one company in 2010 with direct ownership, we checked the names of co-founders across the different companies to avoid double counting some co-founders who may participate in the different companies.

As suggested by Wright, Westhead and Sohl (1998), information was collected on all the businesses in which entrepreneurs had ownership stakes at the level of individual companies. Entrepreneurs' ownership was collected for each company between 2010 and 2019 while considering possible indirect ownership in subsidiaries. This information is used to calculate the variable *average ownership (end)*, which constitutes our first proxy of the entrepreneurial outcome. To calculate this variable, we take the average ownership of all companies in the last three years, namely 2017, 2018 and 2019. Using the average of the last three years has the benefit of reducing the possible idiosyncrasy of the last year.

We also collected companies' financial accounting information, i.e. total assets, total liability and total shareholder equity, used for measuring further proxies of entrepreneurial outcomes. One is the average weighted leverage of entrepreneurs, which captures financing decisions. To do so, the weights are required for each company each year. We first employ the company's total assets to determine entrepreneurs' assets in each company each year and then calculate the sum of the total assets of entrepreneurs each year. If there is one company in the entrepreneur's portfolio with missing information for all the sampled years, we did not calculate the sum of entrepreneurs' total assets in that year. Because we cannot obtain the total assets of such entrepreneur's entire portfolio, the sum of the entrepreneur's total assets is therefore unavailable. When an entrepreneur's total assets can be calculated, the proportion of an entrepreneur's assets in one company to the sum of his/her total assets in each year is obtained as the company weight. Next, we calculate leverage at

the company level by dividing total liability by total assets. We then use the company weights (based on total assets) to obtain the average weighted leverage of entrepreneurs for the last three years. The 5% highest weighted leverage values were winsorized to reduce the effect of outliers.

A final set of proxies concerns average total assets at both the company and entrepreneur levels in the last three years. The proxy at the company level captures the number of assets managed by the entrepreneur, while the proxy at the entrepreneurial level captures the number of assets owned by the entrepreneur. We obtained the average of the total assets in entrepreneurs' owned company/ies between 2017 and 2019 and the average of total assets owned by an entrepreneur between 2017 and 2019. We also used winsorized natural logarithm to reduce the effect of outliers. We use the total amount of assets managed to define high-growth entrepreneurs, as those belonging to the top quartile of the distribution[24].

We construct a number of other variables used as control variables and instrumental variables in the regressions, next to different fixed effects. Appendix 2.1 presents detailed definitions and descriptions of the calculation for all variables.

Table 2.1 presents summary statistics of the full sample of 1,000 entrepreneurs in Panel A. The subsample of habitual versus single entrepreneurs and high-growth versus non-high-growth entrepreneurs are in Panel B, including diff-in-mean tests between the different categories. 30.1% of the entrepreneurs are habitual, among which most are portfolio entrepreneurs[25]. The average age of entrepreneurs at the time of their first company launch is 41 years old. There is no meaningful (although statistically significant) difference between the different types of entrepreneurs.

[24] While there is no clear definition of high growth entrepreneurs, it is generally characterized at the company level by the high growth of sales or job creation over a short period of time (Autio, 2016), mostly the first years of the company's existence. For example, a common threshold that a yearly sales growth rate reaches at least 20% for three or more consecutive years is used for classifying scale-up firms (Cavallo et al., 2019; Fischer and Reuber, 2011; Eurostat and OECD, 2007; Sims and O'Regan, 2006). Since we take the entrepreneurial level perspective and given data limitation for new companies, we focus on assets and thus size of activities.

[25] In total, there are 51 serial entrepreneurs. 14 have sold their first company successfully; 16 started a new company, while the first or the subsequent one failed, which led to one-year ownership overlapped; and 21 have created their second company in 2019 (and thus are classified as serial entrepreneur following our definition).

65.9% of entrepreneurs are male. The median entrepreneur starts one company with one co-founder, and only 14.7% of the entrepreneurs have prior managerial experience. The number of co-founders in the initial team is equally split between family and non-family members. The number of co-founders, especially non-family co-founders, is larger for habitual than single entrepreneurs, consistent with our prediction. After ten years, habitual entrepreneurs own and manage more assets in absolute terms in terms of outcome. Still, there are no significant differences in percentage ownership in these companies (both close to 60%) nor in their book leverage (both close to 50%). This suggests that companies are financed in similar ways. Appendix 2.2 presents pairwise correlations between these different variables.

[Table 2.1 about here]

In unreported tabulations, we also observe differences in the entrepreneurs with family and non-family co-founders. While age is not different, we find more male non-family co-founders than male family co-founders. Most importantly, the non-family co-founders are much more often experienced. They owned on average 0.64 companies before joining the entrepreneur, while this value is only 0.23 for family co-founders in the initial entrepreneurial team. Moreover, 11.5% (52 out of 453) family co-founders have prior entrepreneurial experience, while 27.7% (128 out of 462) non-family co-founders have prior entrepreneurial experience. These different figures indicate that non-family co-founders tend to be more experienced entrepreneurs than family co-founders.

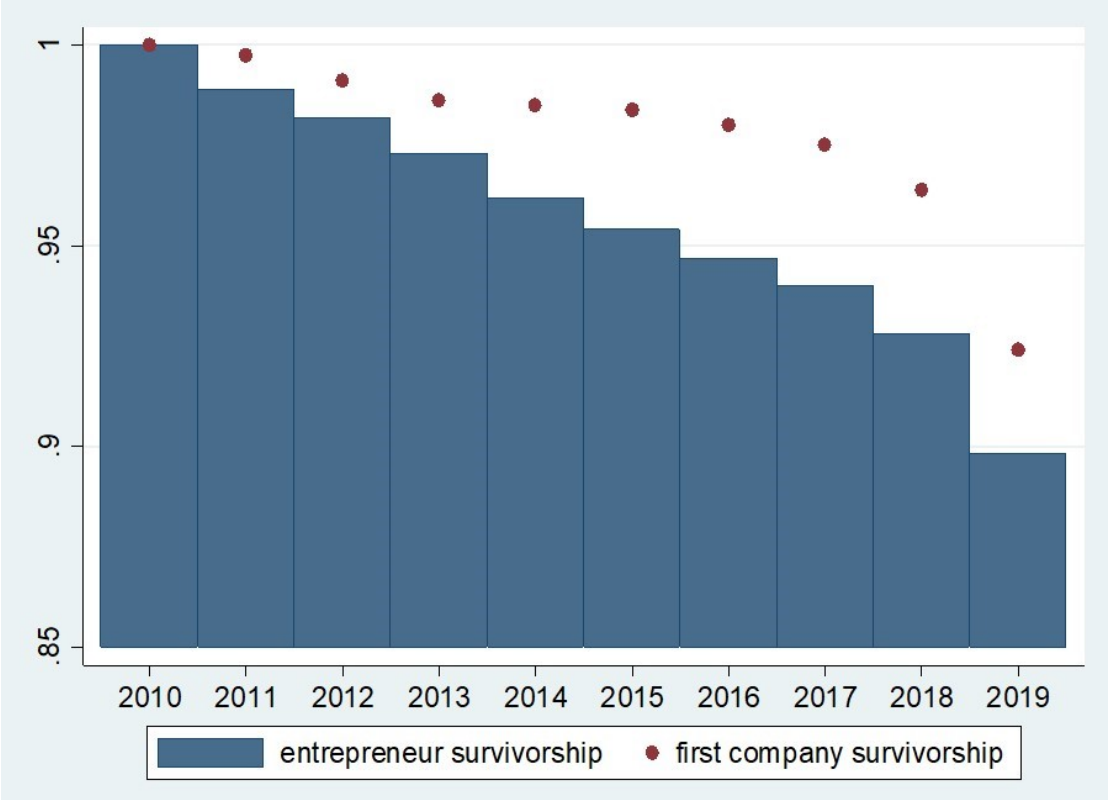
Before moving to the multivariate analyses, let us examine the survivorship ratios of companies and entrepreneurs over time. Figure 2.1 shows survivorship ratios by year and indicates that companies started in 2010 do, on average, survive longer (see Panel A)[26]. For instance, in 2019, about 11% of the entrepreneurs have left entrepreneurship,

[26] To perform this comparison, we only consider initial companies that were started in 2010, at the same time as our entrepreneurs. A few assumptions are however needed. First, if a company was still active in 2019, we counted the company as survived company. Also, if an entrepreneur had still owned at least one active company at the end of 2019, we counted him/her as survived entrepreneur. Second, considering the situation that in 2010, a company with three founders who chose different entrepreneurial paths, say portfolio, serial and single, we need to count

while 7% of the companies only stopped. The survivorship ratio of entrepreneurs is consistently below that of companies.

Figure 2.1: Survivorship ratios of entrepreneurs and companies, by year

Panel A: The survivorship ratios of entrepreneurs in each year (shown as bars) and the survivorship ratios of the sample of companies that started in 2010 (shown as dots) by year. It includes all 1,000 entrepreneurs and the 804 companies in 2010 included in our sample. Companies started after 2010 are excluded from the calculation in order to make the comparison more meaningful.



Panel B shows the same figures for each type of entrepreneur separately. As one can see, survivorship ratios of portfolio entrepreneurs are systematically higher than their companies, while the opposite remains the case for the other types. These differences are quite intuitive. Portfolio entrepreneurs survive longer as entrepreneurs since they are more diversified and can continue to run another company if one defaults or is sold.

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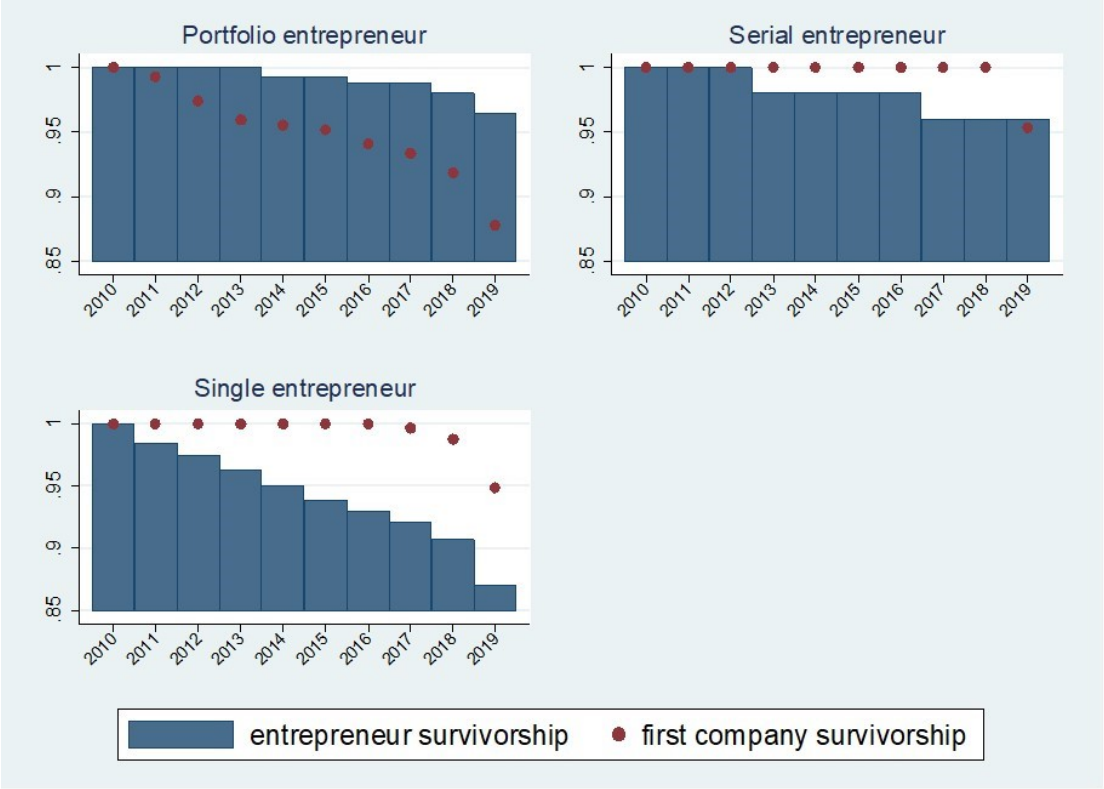
this company in three different classifications to calculate the ratio.

In contrast, by definition, single entrepreneurs are individuals who did not start a new business, so they left if they sold or defaulted in their only business. Serial entrepreneurs are similar to single entrepreneurs, although their survivorship rates are systematically higher. Again, by construction, their greater survival rate is due to the fact that they typically start a new business later on and thus continue as an entrepreneur, despite having left the first business. Interestingly, the survivorship of serial entrepreneurs' businesses is also higher than businesses of single entrepreneurs (around 96% versus 87% in 2019). This indicates that serial entrepreneurs are more likely to sell their first business than see it defaulting.

Panel B: The survivorship ratios of the three types of entrepreneurs separately (shown as bars) and the survivorship ratios of their first founded companies (shown as dots), by year. These statistics are based on our sample of 250 portfolio entrepreneurs, 51 serial entrepreneurs and 699 single entrepreneurs. As for the companies, there are 270 companies owned by portfolio entrepreneurs, 43 companies owned by serial entrepreneurs, and 544 companies owned by single entrepreneurs started in 2010.

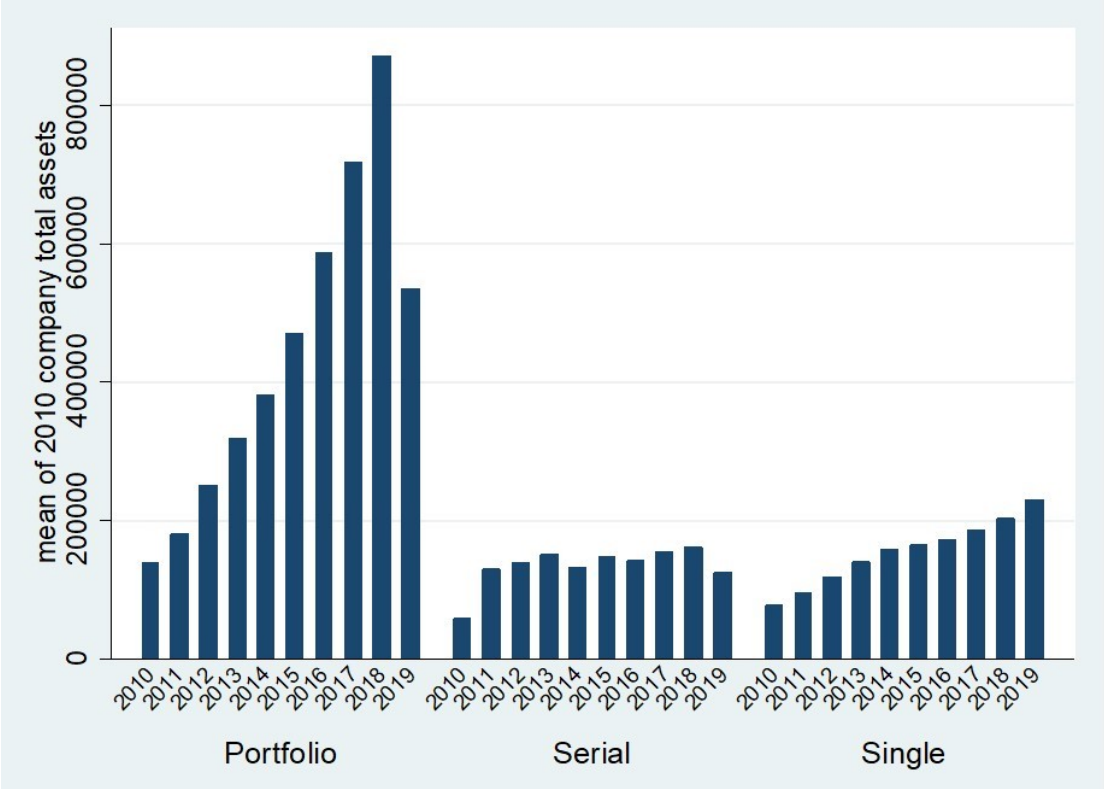


Finally, Figures 2.2 and 2.3 show the development of asset size and liabilities over the same period. They evidence that portfolio entrepreneurs are a distinct type of

entrepreneurs, given that we find much smaller differences between serial and single entrepreneurs. Interestingly, there is little difference between serial and single entrepreneurs, suggesting serial entrepreneurs are not better off than single entrepreneurs. Entrepreneurs become serial either because their first company failed and then they try a second time, or because the first one was successfully sold and they start a new company.

Figure 2.2: Evolution of total assets of first companies

Panel A: The average total assets of the first companies created or purchased in 2010, by entrepreneurial type and year. Thus, these are company-level statistics, not entrepreneur-level statistics, and companies created in 2011 or later are not taken into account in order to facilitate comparison. Companies were excluded after being sold or liquidated.



The fact that their level of assets (and thus entrepreneurial activities) is not fundamentally larger after ten years could suggest they do not learn from their previous experience (either positive or negative experience). Note also the sharp decline in assets for portfolio entrepreneurs in the year 2019. We were not able to identify a particular reason for this decline that only happens for that type of entrepreneur. However, a closer look at the data indicates that we missed information

on assets in 2019 for the largest portfolio companies, which led to a significant drop. Since we do not see any economic reason for it, we take the average of the last three years instead of the values in 2019 only in the empirical analysis of outcomes.

Panel B: The bar chart presents the average of the total assets owned by entrepreneurs in individual companies (Entrepreneur's total assets in each company) and all companies (Entrepreneur's total assets). Note that if there is information missing for any one company's total assets in single or habitual entrepreneurs' holdings in a certain year, both Entrepreneur's total assets in each company and Entrepreneur's total assets are excluded for that year in the following graph.

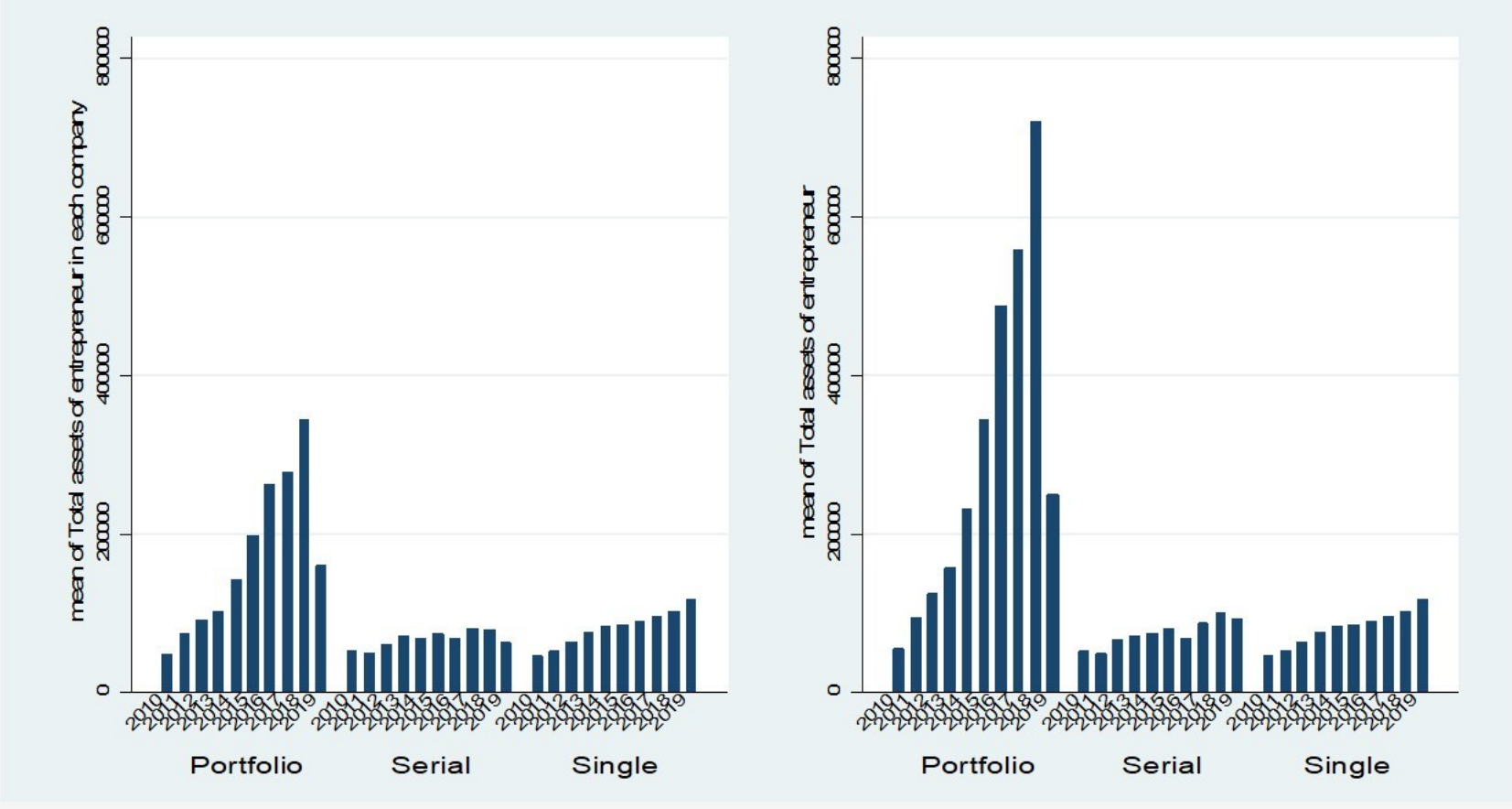
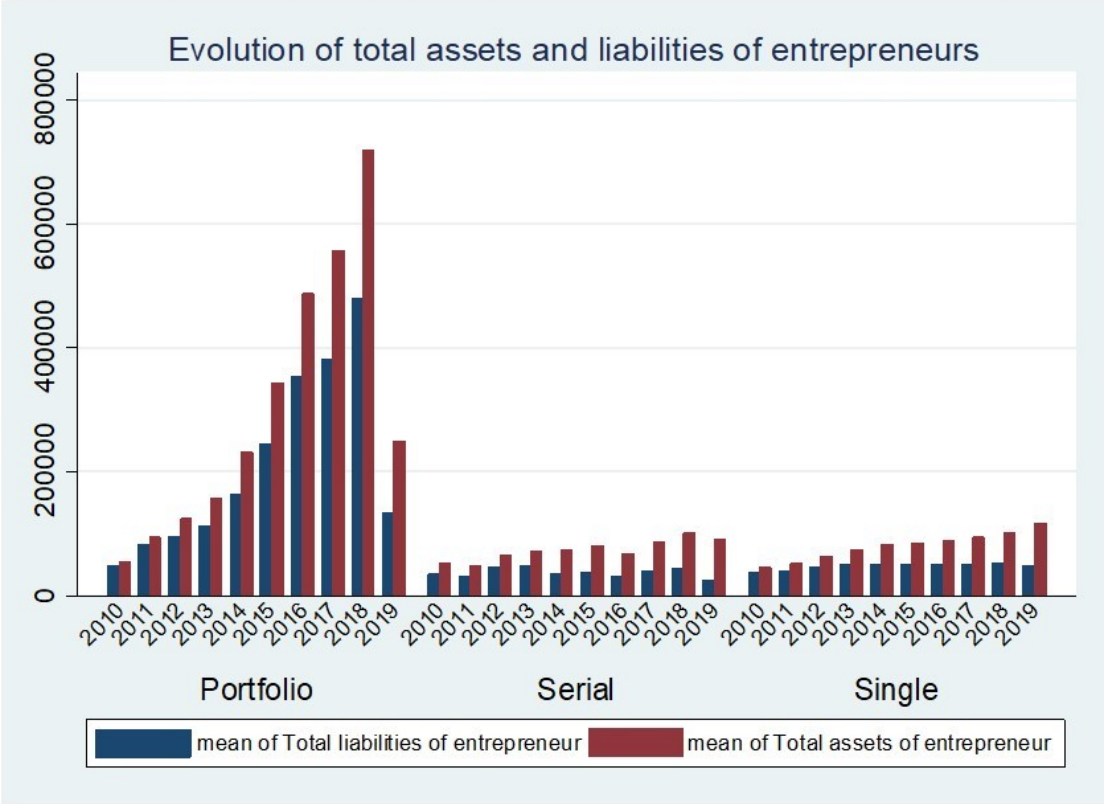


Figure 2.3: Evolution of total assets and liabilities managed and owned by entrepreneurs, by year

The bar chart shows the average total assets and liabilities owned by the entrepreneur in all companies (Total assets of an entrepreneur and Total liabilities of an entrepreneur) by year. Note that we exclude entrepreneurs when one or more owned company/ies in their portfolio have missing information and when they quit before 2017. Thus, the figure is based on 884 entrepreneurs only. Total liability is defined here as follows: total liability is the sum of total current and non-current liability; thus, it equals the difference between total assets and total shareholder equity.



2.4 Methodology

Different econometric methodologies and regression specifications are used to test our hypotheses. To investigate the determinants of becoming a habitual entrepreneur, we conducted Probit as shown in Equation A:

$$Habitual\ entrepreneur_i = \beta_0 + \beta_1 Entrepreneur\ demography_i^T + \beta_2 Entrepreneur\ prior\ managerial\ experience_i + \beta_3 Characterstics\ of\ entrepreneurial\ team_i^T + \beta_4 Controls_i^T \quad \text{(Equation A)}$$

in which Habitual entrepreneur is a dummy variable for the habitual entrepreneurs in Probit regression. Entrepreneur demography represents the variables of entrepreneurs' demographic information, i.e., age in 2010[27], and a dummy variable for gender. *Entrepreneur prior managerial experience* is a dummy variable for an entrepreneur's managerial experience before 2010. The matrix of *Characteristics of entrepreneurial team* consists of the age and gender diversity of the entrepreneurial team, including the entrepreneur, and the number of co-founders or the number of non-family and family co-founders in entrepreneurs' first company or companies. And we include co-founders' entrepreneurial experience before 2010. The matrix of *Controls* contains the natural logarithm of gross dispensable household income (GDHI) per head based on the location of the first company in 2010, the natural logarithm of full-time employees' income based on entrepreneur's age in 2010, the natural logarithm of the population based on entrepreneur's first company location, and the fixed effect of the industry of entrepreneur's first company. The detailed variable description is presented in Appendix 2.1.

To examine the entrepreneurial outcomes of entrepreneurs, we conducted both Tobit and linear regression as shown in Equation B:

$$Entrepreneurial\ outcomes_i = \beta_0 + \beta_1 Habitual\ entrepreneur_i + \beta_2 Controls_i^T + \delta_{i,t} \quad \text{(Equation B)}$$

in which *Entrepreneurial outcomes* represents three groups of entrepreneurial outcomes concerning about 4 proxies mentioned above, i.e. average ownership (end), weighted leverage (end) and total assets at the company- and entrepreneur-level between 2017 and 2019.

[27] The impact of age on becoming habitual and our outcome variables is unclear. For instance, a recent study by Azoulayet al. (2020) shows the relationship between age and high-growth entrepreneurship, motivated by opposing views in the literature. One widespread view is that the most successful companies built on great ideas are created by young people, such as Microsoft, Apple, and Facebook. The other view argues that young people perform less well, since they lack experience, market knowledge, and contacts in the industry. They further are more likely financially constrained.

2.5 Empirical Results

We present in this section three sets of results to test our hypotheses. Section 2.5.1 investigates the determinants of becoming a habitual entrepreneur. Section 2.5.2 tests the impact of the initial founding team and entrepreneurial type on the ultimate outcome for the entrepreneur. Section 2.5.3 examines the effect of initial founding team composition and entrepreneurial type on becoming high-growth entrepreneurs.

2.5.1 Determinants of Habitual Entrepreneurs

Table 2.2 presents Probit regression results on the determinants of becoming a habitual entrepreneur. Hypothesis 1 predicts a positive effect of the size of the initial founding team on becoming habitual. Moreover, Hypothesis 2 predicts that the effect is particularly pronounced for non-family co-founders. A set of control variables are included, as described in the accompanying note in Table 2.2. We further include industry fixed effects, since some industries may be more conducive to enabling the management of multiple businesses while others are less. Significance tests of coefficients are performed with robust standard errors. Reported coefficients are marginal effects.

We find that an increase in the number of co-founders increases the probability of becoming a habitual entrepreneur by 5.5% for each additional co-founder, based on our most conservative estimates (Model A(1)). This magnitude is statistically but also economically meaningful, given the variation in our sample. Moreover, Models A(2) and B(2) indicate that this significant effect is driven by non-family co-founders, while family co-founders have no significant effect. Combining these results, we obtain empirical support for Hypotheses 1 and 2. However, support for Hypothesis 2 is only partial, since a difference-in-coefficient test (i.e., the difference between 0.057 and 0.034 in Model B(2)) turns out to be non-significant. Thus, while the two types of co-founders are not that different, only the non-family co-founders provide significant impact. As argued before, these hypotheses build on the notion that co-founders bring

extra resources and experience that help entrepreneurs to grow more, also outside the first company, and to start new activities if the first is either stopped or sold. These extra resources and experience may be particularly more effective and significant for non-family co-founders, where the choice of co-founders is wider than only relying on the family.

As mentioned in the previous section, we scrutinized the information of entrepreneurs' co-founders to understand their differences in terms of experience better. 628 entrepreneurs started the first company/ies with co-founders, in which 253 entrepreneurs have only non-family co-founders, 341 entrepreneurs have only family co-founders, and 34 entrepreneurs have both family and non-family co-founders. When scrutinizing the information on them, we found that non-family co-founders, on average, tend to be younger males and have more entrepreneurial experiences compared to family co-founders. This last difference is consistent with our findings so far that support Hypothesis 2.

In terms of control variables in Table 2.2, we find that age is negatively related to the chances of becoming habitual, although the economic significance appears small. Male entrepreneurs and entrepreneurs with prior managerial experience are more likely to become habitual, consistent with the view that risk-aversion (which is lower for younger and male entrepreneurs) and having managerial experience affects the propensity to engage in entrepreneurial activities, including starting follow-up activities. Finally, initial entrepreneurial team diversity (Ko et al., 2021) has no effect. In contrast, the level of experience brought by the most experienced co-founder does.

[Table 2.2 about here]

2.5.2 Determinants of Entrepreneurial Outcomes

Let us now turn to test Hypothesis 3 on the determinants of entrepreneurial outcomes. As pointed out before, we consider different outcome dimensions, and all are measured towards the end of the sample period (averages of the year 2017 to 2019).

The first one is ultimate ownership retained by the entrepreneur in the companies he/she initiated. We use the un-weighted average of ownership in the different companies for entrepreneurs who were active in more than one company at the end of the period. This dimension captures the extent of control retained by the entrepreneur and may drive the choice of remaining a single entrepreneur. The second one we study is financial leverage, which is weighted according to each company's total assets for multiple companies.

This dimension captures financing decisions of entrepreneurs and indirectly access to debt finance. The third and fourth measures relate to total assets. One captures the number of assets *owned* directly by the entrepreneur, taking into account his/her ownership stake. The other one relates to the number of assets *managed* by the entrepreneur, as it sums up the total assets of companies co-owned at the end of the sample period. Broadly speaking, these two asset-based measures capture the number of assets accumulated by the entrepreneur. Following Hypothesis 3, we expect entrepreneurs with more initial co-founders to have on average less ownership, less leverage, more assets owned, and more assets managed.

Results are reported in Table 2.3. Model A(1) and B(1) present the results for the average ownership of the entrepreneur. We find no differences between habitual and single entrepreneurs. However, more co-founders reduce entrepreneurial ownership, consistent with the idea that they enable reducing own commitments in individual companies, which then can be used to fund others in the course of becoming a habitual entrepreneur. Thus, co-founders dilute the ownership of entrepreneurs as they also hold shares. Co-founders bring financial resources used to finance entrepreneurial activities, leading to a reduced level of control of the entrepreneur by about 17.6% each additional co-founder. This finding is consistent with Hypothesis 3. In Models B(2), we split the number of co-founders by family and non-family co-founders. We find that both impact ownership significantly. While the effect is larger for non-family co-founders (18% versus 14.8% per additional co-founder), this difference is not statistically different.

We present similar regressions in Model A(2) and B(2) for leverage. Again, we find no significant differences between habitual and single entrepreneurs, suggesting that they finance their entrepreneurial activities similarly despite (as we will see next) the fact that the amount of assets varies greatly across them. A greater initial entrepreneurial team reduces leverage, again consistent with the idea that more co-founders bring more financial resources so that less debt is needed to acquire assets. This further lends support to Hypothesis 3. We find the impact of both family and non-family co-founders, which, however, no statistical difference between the two.

Model A(3) and B(3) consider the number of assets managed by entrepreneurs in all owned companies. This proxy captures the size of entrepreneurial activities, as measured by the sum of all assets of all the companies in which the entrepreneur held some direct or indirect ownership at the end of the ten years. As expected, habitual entrepreneurs manage more assets. Controlling for entrepreneurial types, the size of the founding team still affects the size of these entrepreneurial activities, suggesting the positive effects of habitual entrepreneurial activities and having co-founded the first company with other entrepreneurs. This is consistent with Hypothesis 3. Also, when disentangling family from non-family co-founders, we find similar effects.

Model A(4) and B(4) present the determinants of assets owned by the entrepreneur, based on his/her direct and indirect ownership stakes in the different companies. This measure captures the number of assets accumulated over time by the entrepreneur, based on ownership. Similar to assets managed, habitual entrepreneurs end up also owning more assets. In contrast to the previous findings, however, the size of the founder team has no impact on total assets owned after ten years by the entrepreneur (inconsistent with Hypothesis 3), suggesting the channel goes through the type of entrepreneurial type.

[Table 2.3 about here]

Table 2.4 reports the results of the regressions as above, but with instrumental variables for habitual entrepreneurs. By instrumenting habitual entrepreneurs with

three instrumental variables, we confirm that the interpretation of results does not suffer from an endogeneity issue. Being habitual entrepreneurs both explains their managed assets (Model A(3) and B(3)) and significantly impact their owned assets (Model A(4) and B(4)). This may explain the financial incentive of being a habitual entrepreneur. It is to maximize their assets. As we concluded in Table 2.3, the number of initial co-founders produces larger entrepreneurs' managed assets, but not entrepreneurs' owned assets. While having a more experienced co-founder generates both greater managed assets and owned assets.

[Table 2.4 about here]

Finally, we run the same analysis but at the company level, more consistent with much of the existing literature, in order to highlight the importance of choosing the right unit of analysis. Results are shown in Table 2.5. We again run the same regressions as in Table 2.4 but at the company level. Many differences appear, which allows us to highlight those with regard to habitual entrepreneurs. When taking the company level, we observe that habitual entrepreneurs own less ownership, indicating that they diversify their investment by holding less ownership in individual companies.

We obtain that habitual entrepreneurs show fewer assets under management (Model A(3) and B(3)) and owned considerably fewer assets after ten years (Model A(4) and B(4)). This is not only the opposite of what we obtained at the entrepreneurial level, but also inconsistent with what one would expect. Instead, these results simply indicate that individual companies of habitual entrepreneurs are smaller. Still, we cannot infer anything about the entrepreneur himself/herself. This requires taking an entrepreneurial-level perspective. Our analysis in Table 2.4 shows that, while entrepreneurs owned less ownership in individual companies and individual companies were smaller, habitual entrepreneurs' overall ownership was not reduced. They owned and managed more assets after ten years than single entrepreneurs.

[Table 2.5 about here]

2.5.3 Determinants of Entrepreneurial High-Growth Status

Then, we run Probit regression with instrumental variables to examine the effect of being habitual on becoming high-growth entrepreneurs, who are defined as entrepreneurs whose average managed assets between 2017 and 2019 are in the top quartile. As shown in Table 2.6, we observe that being a habitual entrepreneur significantly increases the possibility of experiencing high growth in managed assets after ten years of entrepreneurial activity. Also, the co-founder's entrepreneurial experience marginally contributes to the high-growth entrepreneur in Model A(1) and B(1). Regardless of the type of cofounders, the number of co-founders also raises the possibility of becoming high-growth entrepreneurs.

[Table 2.6 about here]

There are 73 portfolio entrepreneurs, 3 serial entrepreneurs, and 128 single entrepreneurs among high-growth entrepreneurs. Given the number of entrepreneurs in different classifications, 29.2% (73/250) of portfolio entrepreneurs, 5.9% (3/51) of serial entrepreneurs, and 18.31% (128/699) of single entrepreneurs were high-growth. In other words, 25% (76/301) of habitual entrepreneurs achieved to grow their assets substantially in ten years. If we consider that the number of entrepreneurs without missing information in assets, in observed entrepreneurs in different classifications, 41.5% (73/176) of portfolio entrepreneurs, 25% (3/12) of serial entrepreneurs and 18.4% (128/695) of single entrepreneurs were managed top-quartile assets in their owned companies, suggesting that 40.4% (76/188) of habitual entrepreneurs are high-growth in terms of managed assets.

Among the high-growth entrepreneurs, 94.05% (174/185) of their first company's average assets between 2017 and 2019 have experienced high growth. These top-quartile companies started in 2010 are managed by 46 portfolio entrepreneurs, 1 serial entrepreneur, and 147 single entrepreneurs. It is to say that 18.4% (46/250) of the portfolio, 2% (1/51) of the serial and 21.03% (147/699) the single entrepreneurs do

not only achieve to grow their managed assets at the personal level, but also grow the first company assets.

To confirm that the contribution of the first company's growth to the overall growth is not simply due to the time length of operating and possible survivorship, we calculate the assets accumulated for each company separately in the first three years for high-growth habitual entrepreneurs. By fixing the time to three years, we can better compare habitual entrepreneurs' first and follow-up companies and investigate whether the first one is larger than the follow-up company. In doing so, we are able to see whether the asset growth of the first company is a good predictor of future high-growth entrepreneurs. The multi-variable results are shown in Table 2.7.

The regressions are done at the company level, and we are interested in the sign of the dummy "first company". The results in Panel A indicate that habitual entrepreneurs' first company experienced significantly higher growth in assets than the second company over the first three years of existence. In Panel B, we repeat the same analysis but for high-growth habitual entrepreneurs only. There, we obtain the same results.

[Table 2.7 about here]

2.6 Extension and Robustness Tests

We have performed several extra tests and investigations to evidence the robustness of our results.

First, as mentioned in the variable construction, we took into account subsidiaries, since these represent indirect ownership and assets managed in a similar way as to direct ownership. Also, these only affected very few cases, so we do not expect it to materially impact our findings. Still, we re-ran the entire analysis, excluding subsidiaries where the entrepreneur only held indirect ownership. This led us to conclude similarly, so the inclusion of these indirectly owned subsidiaries does not affect our results.

Furthermore, we defined so far portfolio and serial entrepreneurs within the group of habitual entrepreneurs by using two overlapping years of ownership as our baseline. More precisely, if an entrepreneur held more than one company between 2010 and 2019, and the number of overlapping years of ownership in these companies is equal to, or more than 2 years, we classified them as portfolio entrepreneur; and if an entrepreneur held more than one company and the number of overlapping years is less than 2 years, we classify him/her as a serial entrepreneur. The use and length of overlap are motivated by the fact that entrepreneurs require some time to sell their first company and may already start a second before having sold it[28]. Importantly, considering the few cases of entrepreneurs who created more than one company in 2010, we classified them all as portfolio entrepreneurs, even if the number of overlapping years is less than two years. As mentioned above, we also considered subsidiaries in the classification of entrepreneurs, even if the entrepreneur's ownership into the subsidiary is only through the first parent company (so "indirect ownership"). There, the criterion is still two years of overlapping, and regardless it is a subsidiary or parent company. For example, an entrepreneur who created a first parent company in 2010 and a subsidiary in 2014, and has held both until 2016, is classified as a portfolio entrepreneur.

We also investigate whether our assumption on the two-year overlap to split portfolio and serial entrepreneurs is critical. In the analysis presented so far, we assumed that entrepreneurs who owned two companies but for only a short period – assumed as being two years maximum – were classified as serial. The reason for allowing a small overlap for serial entrepreneurs is that it takes time to sell a company. To ensure that our results are not affected by this assumption, we re-classify the entrepreneurs using a much shorter, one-year overlapping window and re-run the multivariate analyses. In other words, when an entrepreneur held more than one company between 2010 and

[28] As robustness check, we reran the entire analysis with an overlap of one year, which does not change the classification between habitual and single entrepreneur but affects the classification between serial and portfolio entrepreneurs. As it will be discussed in Section 6, our conclusions on the hypotheses testing remain unaffected.

2019 and the number of overlapping years is at least one year; (or if an entrepreneur created more than one company in 2010), these are coded as portfolio entrepreneurs. Serial entrepreneurs are those who held more than one company between 2010 and 2019, but the number of overlapping years is less than a year. Note that this alternative classification could only affect the results for portfolio and serial entrepreneurs, since the classification remains identical for habitual and single entrepreneurs as before. The results indicate that our prior findings in terms of ownership, weighted leverage ratio, company assets and entrepreneur's assets are robust to this alternative specification of different habitual entrepreneurs.

We then rerun the tests. To be exact, we revisit the determinants of portfolio and serial entrepreneurs, compare entrepreneurial outcomes and their effects on becoming high-growth entrepreneurs. The results show that the findings in the previous section are primarily driven by the portfolio entrepreneurs (Appendix 2.3). This suggests that serial entrepreneurs are not fundamentally different from single entrepreneurs, and much of the effects we have uncovered for habitual are, in fact, due to portfolio entrepreneurs.

Finally, we ensure that our regressions are not affected by multicollinearity problems, which could affect our coefficient tests. In particular, this problem could be particularly acute for the second group of tests on outcomes, where we also include the entrepreneurial types as explanatory variables. The mean and maximal values of variance inflation factors (VIF) were reported in previous regressions. Both types of VIF are well around 2.5. Furthermore, the classifications of entrepreneurs and the variables of team composition do not suffer from severe multicollinearity issues, with all values of VIF below 3.

2.7 Discussion and Conclusion

Our findings offer several implications for entrepreneurs. Most importantly, our study highlights the importance of the initial entrepreneurial team that surrounds any novice

entrepreneur. While this team shapes the first company, it also affects the entrepreneur's career path in the long run, as studied here over the first ten years of entrepreneurial activity. One way this is evidenced is through the impact on becoming a habitual entrepreneur. Another directly related way is in the way these activities grow and are financed.

Our study also has implications for research, since we highlight that taking the entrepreneurial perspective offers complementary views on how entrepreneurial activities develop over time and the different paths and strategies followed by novice entrepreneurs. At the same time, our study opens different avenues for future research. First, various context-dependent factors could be further studied. One is education, which is likely to affect the ability of individuals to transform opportunities into action. Studying the impact of education while taking an entrepreneurial perspective would allow studying how individuals who decided to enter entrepreneurship evolve. Second, a still unexplored research question here is the analysis of serial entrepreneurs, which are of two types. Some become serial entrepreneurs after selling their first company, others after having failed the first time. The approach taken here allows shedding new light on the determinants of failing entrepreneurs to leave entrepreneurship or start a new activity. This research question is of particular interest given the government support given to novice entrepreneurs in most developed economies. It may be economically more relevant to support serial entrepreneurs than entrepreneurs who stop after a failure. Such an analysis could shed light on which novice entrepreneurs to prioritize.

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Table 2.1: Descriptive statistics at the entrepreneurial level

Panel A: Full sample

This panel presents the full-sample descriptive statistics (obs., mean, std. dev., min/max, median) for variables used at the entrepreneurial level analysis. All the variables are defined in Appendix 2.1.

	Obs.	Mean	Std. Dev.	Min	Median	Max
Entrepreneurial characteristics:						
Habitual entrepreneur (d)	1000	0.301	0.459	0.000	0.000	1.000
Portfolio entrepreneur (d)	1000	0.250	0.433	0.000	0.000	1.000
Serial entrepreneur (d)	1000	0.051	0.220	0.000	0.000	1.000
Single entrepreneur (d)	1000	0.699	0.459	0.000	1.000	1.000
Age of entrepreneur (start)	984	41.387	10.201	17.000	40.000	78.000
Male entrepreneur (d)	1000	0.659	0.474	0.000	1.000	1.000
No. companies (overall)	1000	1.548	1.245	1.000	1.000	17.000
No. companies (start)	1000	1.059	0.275	1.000	1.000	4.000
Managerial experience (d)	1000	0.147	0.354	0.000	0.000	1.000
No. co-founders (start)	1000	0.919	1.172	0.000	1.000	19.000
No. non-family co-founders (start)	1000	0.468	1.083	0.000	0.000	18.000
No. family co-founders (start)	1000	0.451	0.674	0.000	0.000	4.000
Gender diversity (start)	1000	0.229	0.243	0.000	0.000	0.500
Age diversity (start)	911	0.832	0.949	0.000	0.535	3.221
Co-founders' entrepreneurial experiences (start)	1000	0.330	1.392	0.000	0.000	26.000
GDHI per head by region	868	9.747	0.272	9.281	9.726	10.662
National employee income by age	984	10.201	0.116	9.520	10.247	10.271
Population	900	10.209	0.810	5.017	10.348	11.946
Outcome variables:						
Average ownership (end)	1000	0.596	0.302	0.000	0.500	1.000
Weighted leverage (end)	820	0.510	0.491	0.000	0.353	2.047
Total assets of companies (end)	820	11.143	1.769	4.472	11.082	14.622
Total assets of entrepreneur (end)	820	10.530	1.694	4.472	10.564	13.589
High-growth entrepreneur (end)	820	0.249	0.433	0.000	0.000	1.000

Panel B: Sub-sample by entrepreneurial type

This panel presents descriptive statistics (obs., mean) by entrepreneurial type. The columns report p-values obtained from t-tests that compare the difference-in-means between habitual and single entrepreneurs and between top-quartile growth and non-top-quartile growth entrepreneurs, respectively. All the variables are defined in Appendix 2.1.

	Habitual entrepreneur			Single entrepreneur		High-growth entrepreneur			Non-high-growth entrepreneur	
Variables	Obs.	Mean	p-value	Obs.	Mean	Obs.	Mean	p-value	Obs.	Mean
Age of entrepreneur (start)	301	40.030	0.006	683	41.985	202	42.356	0.379	605	41.626
Male entrepreneur (d)	301	0.718	0.010	699	0.634	204	0.657	0.749	616	0.644
No. companies (overall)	301	2.947	0.000	699	1.000	204	1.657	0.000	616	1.224
No. companies (start)	301	1.203	0.000	699	1.000	204	1.083	0.018	616	1.036
Managerial experience (d)	301	0.213	0.000	699	0.119	204	0.123	0.615	616	0.136
No. co-founders (start)	301	1.103	0.001	699	0.838	204	1.309	0.000	616	0.726
No. non-family co-founders (start)	301	0.654	0.000	699	0.388	204	0.760	0.000	616	0.286
No. family co-founders (start)	301	0.449	0.963	699	0.451	204	0.549	0.047	616	0.440
Gender diversity (start)	301	0.227	0.861	699	0.230	204	0.266	0.070	616	0.230
Age diversity (start)	278	0.875	0.375	633	0.814	190	1.069	0.000	561	0.741
Co-founders' entrepreneurial experiences (start)	301	0.641	0.000	699	0.196	204	0.623	0.000	616	0.161
GDHI per head by region	266	9.788	0.003	602	9.729	176	9.782	0.085	533	9.719
National employee income by age	301	10.199	0.744	683	10.201	202	10.209	0.321	605	10.200
Population	277	10.113	0.018	623	10.252	169	10.063	0.004	566	10.262
Average ownership (end)	301	0.604	0.575	699	0.592	204	0.517	0.000	616	0.670
Weighted leverage (end)	178	0.528	0.572	642	0.505	204	0.283	0.000	616	0.585
Total assets of companies (end)	178	11.963	0.000	642	10.916	204	13.388	0.000	616	10.400
Total assets of entrepreneur (end)	178	11.233	0.000	642	10.335	204	12.489	0.000	616	9.881

Table 2.2 Determinants of habitual entrepreneur

This table presents the marginal effects of independent variables on the dummy variable habitual entrepreneur, based on Probit regressions. Note that the marginal effects are estimated using the delta method and compared to the baseline classification of single entrepreneurs. 'Control variables' are GDHI per head by region, national employee income by age and population. Differences in sample size (908 vs. 759) are primarily due to the lack of information to construct industry fixed effects for some entrepreneurs. All the variables are defined in Appendix 2.1. Significance levels reported are based on robust standard errors: *** p<0.01, ** p<0.05, * p<0.1.

	Habitual			
Variables	A(1)	B(1)	A(2)	B(2)
Age of entrepreneur (start)	-0.005***	-0.006***	-0.005***	-0.005***
Male entrepreneur (d)	0.070**	0.111***	0.070**	0.110***
Managerial experience (d)	0.149***	0.159***	0.150***	0.160***
Gender diversity (start)	0.014	0.037	0.039	0.062
Age diversity (start)	-0.036*	-0.042*	-0.035	-0.040*
Co-founder's entrepreneurial experience (start)	0.039**	0.051**	0.039**	0.052**
No. co-founders (start)	0.065***	0.055**		
No. non-family co-founders (start)			0.068***	0.057**
No. family co-founders (start)			0.045	0.034
Control variables	NO	YES	NO	YES
Industry fixed effect	NO	YES	NO	YES
Observations	908	759	908	759

Table 2.3: Regression results on the outcomes at the entrepreneurial level

This table reports the results of the following regressions: 1) the average of entrepreneurs' ownership (the *average ownership (end)*) in their owned companies between 2017 and 2019, using Tobit regression with left-censoring at 0 and right-censoring at 1 (in A(1) and B(1)); 2) the average of entrepreneurs' company leverage (the *weighted leverage (end)*) in their owned companies between 2017 and 2019, using Tobit regression with left-censoring at 0 (in A(2) and B(2)); 3) the average of entrepreneurs' total assets managed (the *total assets of companies (end)*) in their owned companies between 2017 and 2019, using OLS regressions (in A(3) and B(3)); and 4) the average of entrepreneurs' total assets owned (the *total assets of entrepreneur (end)*) in their owned companies between 2017 and 2019, using OLS regressions (in A(4) and B(4)). Unreported 'Control variables' include entrepreneur's age in 2010; gender; indicator variable for entrepreneurs having managerial experience before 2010; national full-time employee's annual income by age; GDHI by administrative region; and population by company's location. All regressions include industry fixed effects based on the entrepreneur's first company/ies in 2010. The mean and maximum VIF are calculated, excluding industry fixed effects. All the variables are defined in Appendix 2.1. Significance levels reported: *** p<0.01, ** p<0.05, * p<0.1.

	Average ownership (end)		**Weighted leverage (end)**		**Total assets of companies (end)**		**Total assets of entrepreneur (end)**	
Variables	A(1)	B(1)	A(2)	B(2)	A(3)	B(3)	A(4)	B(4)
Habitual	0.006	0.007	0.083*	0.082*	1.010***	1.009***	0.968***	0.966***
Gender diversity (start)	-0.187***	-0.221***	-0.066	-0.032	-0.021	-0.001	-0.222	-0.180
Age diversity (start)	-0.065***	-0.067***	-0.013	-0.011	-0.040	-0.039	-0.134	-0.131
Co-founder's entrepreneurial experiences (start)	0.017	0.017	0.001	0.001	0.116**	0.116**	0.120**	0.120**
No. co-founders (start)	-0.176***		-0.123***		0.385***		0.085	
No. non-family co-founders (start)		-0.180***		-0.118***		0.388***		0.090
No. family co-founders (start)		-0.148***		-0.152***		0.368**		0.049
Constant	2.973**	2.825*	3.616*	3.759*	-9.820*	-9.737*	-7.664	-7.489
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	759	759	623	623	623	623	623	623
R-squared					0.186	0.187	0.132	0.132
Mean VIF	1.37	1.45	1.39	1.48	1.39	1.48	1.39	1.48
Maximal VIF	2.33	2.37	2.41	2.50	2.41	2.50	2.41	2.50

Table 2.4: Regression results with instrumental variables on the outcomes at the entrepreneurial level

This table reports the results of the following regressions: 1) the average of entrepreneurs' ownership (the *average ownership (end)*) in their owned companies between 2017 and 2019, using Tobit regression with instrumental variables for habitual entrepreneurs and with left-censoring at 0 and right-censoring at 1 (in A(1) and B(1)); 2) the average of entrepreneurs' company leverage (the *weighted leverage (end)*) in their owned companies between 2017 and 2019, using Tobit regression with instrumental variables for habitual entrepreneurs and with left-censoring at 0 (in A(2) and B(2)); 3) the average of entrepreneurs' total assets managed (the *total assets of companies (end)*) in their owned companies between 2017 and 2019, using two-stage least squares (2SLS) of a linear regression and instrumental variables for habitual entrepreneurs (in A(3) and B(3)); and 4) the average of entrepreneurs' total assets owned (the *total assets of entrepreneur (end)*) in their owned companies between 2017 and 2019, using two-stage least squares (2SLS) of a linear regression and instrumental variables for habitual entrepreneurs (in A(4) and B(4)). The instrumental variables are: 1) the percentage of habitual entrepreneurs by the groups of entrepreneur's age in 2010; 2) the percentage of habitual entrepreneurs by the postcode of companies in 2010; and 3) the interaction term of the percentage of habitual entrepreneurs by industry in 2010 and the percentage of habitual entrepreneurs by the postcode in 2010. Unreported 'Control variables' include entrepreneur's age in 2010; gender; indicator variable for entrepreneurs having managerial experience before 2010; national full-time employee's annual income by age; GDHI by administrative region; and population by company's location. All regressions include industry fixed effects based on the entrepreneur's first company/ies in 2010. All the variables are defined in Appendix 2.1. Significance levels reported: *** p<0.01, ** p<0.05, * p<0.1.

	Average ownership (end)		**Weighted leverage (end)**		**Total assets of companies (end)**		**Total assets of entrepreneur (end)**	
Variables	A(1)	B(1)	A(2)	B(2)	A(3)	B(3)	A(4)	B(4)
Habitual	-0.054*	-0.053*	0.063	0.062	1.198***	1.198***	1.062***	1.061**
Gender diversity (start)	-0.183***	-0.217***	-0.065	-0.030	-0.036	-0.022	-0.230	-0.191
Age diversity (start)	-0.067***	-0.069***	-0.014	-0.011	-0.033	-0.032	-0.130	-0.127
Co-founder's entrepreneurial experiences (start)	0.019	0.019	0.002	0.002	0.109**	0.109**	0.116**	0.116**
No. co-founders (start)	-0.172***		-0.121***		0.368***		0.076	
No. non-family co-founders (start)		-0.176***		-0.117***		0.370***		0.081
No. family co-founders (start)		-0.145***		-0.151***		0.357**		0.044
Constant	2.842**	2.699**	3.604*	3.750*	-9.696*	-9.642*	-7.601	-7.440
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	759	759	623	623	623	623	623	623
R-squared					0.185	0.185	0.131	0.131
Mean VIF	1.37	1.45	1.39	1.48	1.39	1.48	1.39	1.48
Maximal VIF	2.33	2.37	2.41	2.50	2.41	2.50	2.41	2.50

Table 2.5: Regression results with instrumental variables on the outcomes at the company level

This table reports the results of the following regressions: 1) the average of entrepreneurs' ownership (the *average ownership (end)*) in their owned companies between 2017 and 2019, using Tobit regression with instrumental variables for habitual entrepreneurs and with left-censoring at 0 and right-censoring at 1 (in A(1) and B(1)); 2) the average of entrepreneurs' company leverage (the *weighted leverage (end)*) in their owned companies between 2017 and 2019, using Tobit regression with instrumental variables for habitual entrepreneurs and with left-censoring at 0 (in A(2) and B(2)); 3) the average of entrepreneurs' total assets managed (the *total assets of companies (end)*) in their owned companies between 2017 and 2019, using two-stage least squares (2SLS) of a linear regression and instrumental variables for habitual entrepreneurs (in A(3) and B(3)); and 4) the average of entrepreneurs' total assets owned (the *total assets of entrepreneur (end)*) in their owned companies between 2017 and 2019, using two-stage least squares (2SLS) of a linear regression and instrumental variables for habitual entrepreneurs (in A(4) and B(4)). The instrumental variables are: 1) the percentage of habitual entrepreneurs by the groups of entrepreneur's age in 2010; 2) the percentage of habitual entrepreneurs by the postcode of companies in 2010; and 3) the interaction term of the percentage of habitual entrepreneurs by industry in 2010 and the percentage of habitual entrepreneurs by the postcode in 2010. Unreported 'Control variables' include entrepreneur's age in 2010; gender; indicator variable for entrepreneurs having managerial experience before 2010; national full-time employee's annual income by age; GDHI by administrative region; and population by company's location. All regressions include industry fixed effects based on the entrepreneur's first company/ies in 2010. All the variables are defined in Appendix 2.1. Significance levels reported: *** p<0.01, ** p<0.05, * p<0.1.

	Average ownership (end)		**Weighted leverage (end)**		**Total assets of companies (end)**		**Total assets of entrepreneur (end)**	
Variables	A(1)	B(1)	A(2)	B(2)	A(3)	B(3)	A(4)	B(4)
Habitual	-0.084***	-0.084***	-0.064	-0.065	-0.492***	-0.494***	-0.783***	-0.785***
Gender diversity (start)	-0.339***	-0.378***	-0.255**	-0.171	0.086	0.296	-0.381	-0.228
Age diversity (start)	-0.048***	-0.051***	-0.027	-0.019	-0.152	-0.131	-0.138	-0.123
Co-founder's entrepreneurial experiences (start)	0.007	0.008	-0.002	-0.003	0.063	0.060	0.073*	0.070*
No. co-founders (start)	-0.152***		-0.090***		0.577***		0.263**	
No. non-family co-founders (start)		-0.156***		-0.082**		0.599***		0.278**
No. family co-founders (start)		-0.121***		-0.160***		0.403**		0.136
Constant	2.942**	2.810**	2.576	2.859	4.315	5.067	5.489	6.034
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1045	1045	971	971	971	971	971	971
R-squared					0.076	0.077	0.071	0.071
Mean VIF	1.35	1.44	1.34	1.44	1.34	1.44	1.34	1.44
Maximal VIF	2.13	2.34	2.13	2.33	2.13	2.33	2.13	2.33

Table 2.6: Determinants of becoming a high-growth entrepreneur

This table presents the marginal effects of independent variables on high-growth entrepreneurs, using Probit regression with instrumental variables for habitual entrepreneurs. High-growth entrepreneurs is an indicator variable which equals 1 if the total assets managed by entrepreneurs are at the first quartile of total assets managed by entrepreneurs at the end of the observation period (2017-2019), and 0 if the total assets managed by entrepreneurs are not at the first quartile. Note that the marginal effects are estimated by using the delta method. Unreported 'Control variables' are GDHI per head by region, national employee income by age and population. All the variables are defined in Appendix 2.1. Significance levels reported based on robust standard errors: *** p<0.01, ** p<0.05, * p<0.1.

Variables	A(1)	B(1)
Habitual entrepreneur	0.931***	0.932***
Age of entrepreneur (start)	-0.005	-0.005
Male entrepreneur (d)	0.120	0.124
Managerial experience (d)	-0.066	-0.069
Gender diversity (start)	0.024	-0.048
Age diversity (start)	-0.144	-0.153
Co-founder's entrepreneurial experience (start)	0.152*	0.151*
No. co-founders (start)	0.372***	
No. non-family co-founders (start)		0.365***
No. family co-founders (start)		0.436***
Control variables	YES	YES
Industry fixed effect	YES	YES
Observations	623	623

Table 2.7: The contribution of the first company in becoming a high-growth habitual entrepreneur

Panel A: This panel presents the regression results of the company growth within the group of high-growth habitual entrepreneurs, using the linear regression for panel data with generalized least square (GLS) random-effect estimation. The dependent variable is companies' average total assets in the first three years of operation. The interested explanatory variable is an indicator variable for the first company, which equals 1 if a company was created in 2010, and 0 for follow-up companies. Unreported 'Control variables' are GDHI per head by region, national employee income by age and population. All the variables are defined in Appendix 2.1. Significance levels reported based on robust standard errors: *** p<0.01, ** p<0.05, * p<0.1

Variables	A(1)	B(1)
First company (d)	3.226***	3.245***
Age of entrepreneur (start)	0.026	0.052*
Male entrepreneur (d)	-0.011	-0.075
Managerial experience (d)	0.240	0.169
Gender diversity (start)	1.951	2.918**
Age diversity (start)	-0.333	-0.167
Co-founder's entrepreneurial experience (start)	0.050	0.036
No. co-founders (start)	0.711***	
No. non-family co-founders (start)		0.714***
No. family co-founders (start)		-0.043
Constant	-24.075	-11.753
Control variables	YES	YES
Industry fixed effect	YES	YES
Year fixed effect	YES	YES
Observations	302	302
No. of subject	140	140
Between R-square	0.300	0.312

Panel B: This panel presents the regression results of the company growth within the group of high-growth habitual entrepreneurs, using the OLS estimation. The dependent variable is the company's average total assets in the first three years of operation. The interested explanatory variable is an indicator variable for the first company, which equals 1 if a company was created in 2010, and 0 for follow-up companies. Company year represents the year of an entrepreneur entering the company. Unreported 'Control variables' are GDHI per head by region, national employee income by age and population. All the variables are defined in Appendix 2.1. Significance levels reported based on robust standard errors: *** p<0.01, ** p<0.05, * p<0.1

Variables	A(1)	B(1)
First company (d)	2.302**	2.311**
Age of entrepreneur (start)	0.050*	0.068**
Male entrepreneur (d)	-0.433	-0.480
Managerial experience (d)	-0.265	-0.296
Gender diversity (start)	1.673	2.340
Age diversity (start)	-0.446	-0.358
Co-founder's entrepreneurial experience (start)	0.074	0.067
No. co-founders (start)	0.859***	
No. non-family co-founders (start)		0.873***
No. family co-founders (start)		0.378
Constant	8.953	17.012
Control variables	YES	YES
Industry fixed effect	YES	YES
Company Year fixed effect	YES	YES
Observations	145	145
R-square	0.358	0.363

Chapter 3

Entrepreneurial founding team evolution, equity ownership and ownership distribution in early-stage ventures

Entrepreneurial founding teams (EFTs) are key drivers of new ventures' success, and they tend to evolve across phases of ventures. Despite their importance, few studies have considered the sequence of evolutionary events in early-stage ventures. I argue that the sequence of the events in teams makes a difference. The issue was addressed by tracking 1,000 U.K. EFTs for the first ten years of their ventures. The data enable me to observe and identify two additional types of team evolutionary events (crowd-out and replacement) that are based on the sequence of founder departure and new member entry. The results reveal different antecedents (equity ownership, alternative entrepreneurial opportunity and ownership distribution) for founder departure and crowd-out, as well as for new member entry and replacement. Furthermore, equity redistribution after evolution is affected differently by evolutionary events in terms of magnitude. These findings shed light on the importance of the condition and sequence of EFT evolutionary events.

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3.1 Introduction

The majority of new ventures are founded and led by entrepreneurial founding teams (EFTs) rather than individuals (Reynolds & White, 1997; West, 2007). These team members contribute financial, social and human resources to new ventures, i.e. venture development and performance (Klotz et al., 2014). However, the composition of EFTs is not static (Chandler et al., 2005; Lazar et al., 2020; Loane et al., 2014; Patzelt et al., 2020; Ucbasaran et al., 2003). Patzelt et al. (2020) propose the double life-cycle framework that the life cycle of ventures and that of EFTs develop independently[29].

Understanding the EFTs evolution is essential because of the long-lasting effect[30] of early EFTs on ventures (Beckman & Burton, 2008; Rubenson & Gupta, 1997). Entrepreneurial events in the early phase of the venture (e.g., EFT evolution) influence ventures' development (Beckman & Burton, 2008), performance (Chandler et al., 2005)[31], and team diversity and productivity (Ko et al., 2021). This study aims to delve into ETF evolution in early-stage ventures at first the founder level and then the team level.

Notably, this study explores the temporal sequence of evolutionary events. No prior research has defined the phenomena of founder departure and new member entry based on the temporal sequence when both events take place in the same team[32]; thus,

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[29] That is, EFTs can evolve with the departure of team member (team dissolution) and/or entry of new members (team formation), even in the early phase of ventures. The framework emphasizes the dynamic team development in different stages of venture. The authors point out the venture can be young when a cofounder departs, so it is important to capture cofounders' joint journey (experience) in entrepreneurial activities.

[30] As Kimberly (1979, p. 438) notes, "The conditions under which an organization is born and the course of its development in infancy have nontrivial consequences for its later life".

[31] Beckman and Burton (2008) show that founding teams influence the speed with which firms achieve their milestones. In addition, the effect of founder departure is more profound as firms reach later stages of development (Chandler et al., 2005), which implies that team evolution accelerates the life-cycle stage in which the venture is positioned, as well as the imprinting effect of team evolution in early-stage ventures on their follow-up development and performance. Correspondingly, Beckman et al. (2007) find that the dynamic of founder departure and new member addition affect the likelihood that firms attain financing from venture capital and reach the initial public offering stage.

[32] This research gap may be present because researchers mainly collect data through surveys and/or interviews, such as in Ucbasaran et al. (2003); in these cases, participants' self-report data, and thus, the authors are less likely to observe the sequence of events.

researchers may have neglected a critical aspect of the nature of team evolution. Therefore, besides the conventionally defined entrepreneur exit and new member entry, I distinguish founder crowd-out [33] from founder departure, as well as replacement from new member entry. These definitions depend on the temporal sequence of founder departure and new member entry[34].

It is vital to make such distinctions based on temporal sequences, given that entrepreneurship is a process (Aldrich et al., 1986) and "temporal dynamics are the heart of entrepreneurship" (Bird & West III, 1998: 5). The antecedents are argued to be different in these types of team evolution, and the temporal sequence of evolutionary events differentiates their consequences. Accordingly, the question addressed in this study is, "Does the temporal sequence make the reasons and consequence of EFT evolution different?"

To be specific, this study compares the influence of founder's equity ownership and alternative entrepreneurial opportunity on founder departure and crowd-out, the effect of ownership distribution among team members on team evolution and the consequence of team evolution.

At the founder level, although entrepreneurs' strategy, intention and causes of exit from ventures have attracted abundant academic attention and exploration (see, e.g., Boeker & Karichalil, 2002; DeTienne, 2010; DeTienne & Cardon, 2008; DeTienne & Cardon, 2012; Hellerstedt et al., 2007; Parastuty et al., 2016; Wennberg & DeTienne, 2014), equity ownership seems out of scope.

Equity ownership signifies entrepreneurs' control over the venture, rewards and commitment to the venture (Boeker & Wiltbank, 2005; Breugst et al., 2015;

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[33] Because the empirical setting in this study is not able to distinguish founders' intention of departure (i.e., forced or voluntary departure). The term *crowd-out* was used only for distinguishing between founders' departure with and without prior new member entry.

[34] I argue that a founder's decision to depart and the remaining members' decisions to introduce a new member are made under different premises when a prior entrepreneurial evolutionary event has occurred. The decision to recruit a new member after the departure of a founder is affected by characteristics of remaining team members, whereas the decision to leave a venture after a new entry is determined by the characteristics of newly formed entrepreneurial teams. The introduction of a new member after a founder departure is considered a *replacement*, whereas a departure after a new member entry is considered a *crowd-out*.

Ucbasaran et al., 2003). It augments entrepreneurs' psychological ownership (Buchko, 1992) and willingness to work with other members productively (Rosen & Quarrey, 1987). Founders' decisions to depart are argued to result from the amount of equity ownership they have in the venture.

Likewise, an alternative opportunity (including a job opportunity, educational opportunity, or the identification of another new venture opportunity, i.e. alternative entrepreneurial opportunity) is considered a primary force that leads to an entrepreneur's departure from a venture (DeTienne, 2010; Parastuty et al. 2016). However, when turning to alternative entrepreneurial opportunities, it seems paradoxical given the prevailing phenomenon of portfolio entrepreneurship that entrepreneurs simultaneously own and manage more than one venture (Westhead and Wright, 1998). Also, few empirical studies have investigated the role of alternative entrepreneurial opportunities in founders' decision to depart from ventures. This study corroborates the impact of entrepreneurs' alternative entrepreneurial opportunities on their decision to depart conditional on prior new member entry.

At the team level, this study focuses on the ownership distribution among team members. This study examines what team characteristics determine different types of team evolution (i.e. team evolution derived from founder departure, crowd-out, new member entry and replacement) in early-stage ventures. It provides a balanced picture that considers both new member addition and cofounder departure (Lazar et al., 2020).

Conventionally, studies in this area focus on ownership distribution between entrepreneurs and outside investors (Breugst et al., 2015), while EFT members own the majority of their ventures in the early stage. This study aims to fill this gap by considering the ownership distribution among team members only, given that the ownership distributed among team members is more crucial in early-stage ventures when agent conflict is minor (Kroll et al., 2007). Boeker and Karichalil (2002) propose that a concentrated ownership distribution should be positively related to the likelihood of founder departure, while they lack empirical support.

Moreover, this study aims to demonstrate various effects of evolutionary events on follow-up ownership redistribution. Intuitively, one of the strategic consequences of team evolution is the redistribution of ownership among the remaining team members, which can lead to either a more concentrated or more well-dispersed equity distribution. If a team experiences founder departure, the remaining team members may change the subsequent contracting strategy of the ownership redistributed for safeguarding the future departures (Patzelt et al., 2020); however, how such distribution changes remain unexplored.

The research question is examined using manually collected data from Orbis – Bureau van Dijk. 1,000 British (U.K.) privately owned ventures that were created by EFTs in 2010 are randomly gathered and tracked for their evolution through 2019. Information is collected on venture's ownership structure, entrepreneurs' demographics (i.e., age, gender and nationality), their past experience (i.e., managerial experience before entry in the sampled venture, entrepreneurial experience before entry in the sampled venture, co-work experience with other cofounders before entry in the sampled venture) and their occupation/function in the sampled venture. Next, the team-level variables are constructed using entrepreneur-level data, such as heterogeneity of entrepreneurial experience and team familiarity. In total, 2,269 entrepreneurs were involved in these teams, including 2,189 founders and 80 new team members. Within the ten-year observation window, about 20% of EFTs experienced evolution.

Multivariate analyses were employed. First, the Cox proportional hazard model was adopted to examine (1) the effect of equity ownership on founders' decision to depart or crowd out and (2) the effect of disparity of ownership distribution on the four types of team evolution. In addition, dynamic panel data (DPD) analysis was conducted to examine how the ownership distribution strategy changes after team evolution.

The results suggest different determinants for founder departure and crowd-out at both the founder and team level, as well as for new member entry and replacement at the team level. Specifically, at the founder level, owning more equity decreases the

rate of founder departure and crowd-out from the focal ventures. Moreover, alternative entrepreneurial opportunity (concurrent holdings) increases the rate of founder crowd-out but not founder departure. These results highlight the meaningfulness of considering the premises of team evolutionary events and illustrate the different antecedents that determine founder departure and crowd-out. At the team level, the ownership distribution positively impacts the rate of team dissolution (i.e. founder departure), but not other evolutionary events.

As for consequences, team evolution consistently reduces the disparity of ownership distribution, which indicates that team evolution fosters a well-dispersed equity ownership distribution. In the meantime, the different types of evolution have varying effects on follow-up ownership distribution strategy in terms of magnitude, duration and timing. When comparing team evolution caused by founder crowd-out and replacement, the effects vary.

This study contributes to the field in three respects. First, it explores the under-studied field of EFT turnover in early-phase ventures and emphasises the importance of the temporal sequence of founder departure and new member entry. Embedded in the double life-cycle framework (Patzelt et al., 2020), this study is the first to illustrate the different antecedents of EFTs' complex dynamics in early-stage ventures. Second, this study provides new evidence for the role of founders' equity ownership and alternative entrepreneurial opportunity in their decision to depart. It corroborates the proposition that alternative entrepreneurial opportunity influences an entrepreneur's decision to depart conditional on prior new member entry. In addition, the role of ownership distribution among team members in early-stage ventures is investigated for the first time. Third, this study fills the research gap of the short-term strategic consequences of team evolution: this research is the first to show evidence that team evolution plays a significant role in setting a follow-up strategy of equity ownership distribution. It provides implications for the potential team evolutionary events in the next stage of ventures that can help attract and attain external financing in the long run (e.g., obtaining venture capital, going public).

The remainder of this paper proceeds as follows. In Section 3.2, I discuss and review prior studies in terms of why the temporal sequence of founder departure and new member entry is of significance. In addition, the literature is reviewed along with hypotheses development with respect to the role of founders' equity ownership, alternative entrepreneurial opportunity, and ownership distribution among team members in founders' decision to depart and team evolution. Next, the possible strategic consequences of team evolution and changes in ownership distribution are presented. The sample, methodology and variables are introduced in Section 3.3. Sections 3.4 and 3.5 present empirical results and the robustness tests. In the final section, I discuss the results and provide practical suggestions for EFT management.

3.2 Literature Review and Hypotheses Development

This section first discussed the importance of temporal sequence in team evolutionary events. And then, I review the literature with respect to the variables of interest: founder's equity ownership, alternative entrepreneurial opportunity and team-level ownership distribution and strategic consequences. The following sub-sections present the discussion of the relevant literature for each topic in turn.

3.2.1 The temporal sequence of evolutionary events

Entrepreneurial team members contribute financial, social and human resources to new ventures and to venture development and performance (Klotz et al., 2014). While entrepreneurship is a process (Aldrich et al., 1986) and "temporal dynamics are the heart of entrepreneurship" (Bird & West III, 1998: 5). EFT composition is dynamic over time (Chandler et al., 2005; Lazar et al., 2020; Loane et al., 2014; Patzelt et al., 2020; Ucbasaran et al., 2003).

The double life-cycle framework suggests that entrepreneurial teams can evolve at any phase (incorporation, mature or decay) of a venture. There can be potential nonlinear sequences within these venture phases. Although the "entrepreneurial team life cycle is embedded in the venture life cycle, it is still independent of it" (Patzelt et

al., 2020: 2). Just as chief executive officer (CEO) succession and TMT turnover can occur in the same large company (Tangpong et al., 2021), founder departure and new member entry can also occur in the same new venture. Founder departure signifies the dissolution of initial EFTs, and new member entry symbolises the reformation of EFTs.

Kang and Uhlenbruck (2006) note that the sequence of events in entrepreneurship shapes and modifies entrepreneurial activity. They further demonstrate that both internal and external factors determine an entrepreneur's transition; for example, EFT evolutionary events serve as internal factors that affect teams' and individual members' posterior decisions as well as ventures' subsequent performance.

In the entrepreneurial setting, founders' attitudes and future actions should be different between experiencing and not experiencing a new member entry. Introducing a new member to an existing EFT suggests reforming the team, and the diversity of a newly formed team can be considered a significant factor that leads to management turnover (Harrison et al. 1998). Changes in membership are likely to generate coordination difficulties (Kim et al., 2005), such that the changed characteristics and the working environment can alter initial team members psychologically (Patzelt et al., 2020).

New teams' diversity derived from new member entry can also lead to affective conflicts (Amason & Sapienza, 1997). Furthermore, the higher the level of conflict within a team, the greater the possibility that a team member departs (Ucbasaran et al., 2003), thus leading to another team evolutionary event: crowd-out. Founders may consider themselves creators, while newcomers may consider themselves reformers. This potential conflict is then likely to influence their performance and interpersonal attraction and can further lead to founders being crowded out. In such cases, the founder's departure occurs under a different premise than when a founder departs without previous new member entry.

In the meantime, if an EFT experienced a cofounder departure, the remaining founders may consider that everyone in the team, including themselves, is replaceable (Patzelt et al., 2020), which may lead to higher rates of future team member exit and entry. Also, a cofounder departure may change remaining team members' attitudes toward their teams (e.g., team satisfaction and viability; Foo et al., 2006).

On the other hand, the departure of a cofounder who has different beliefs is likely to bring convergence among the remaining team members' beliefs and vision (Loane et al., 2007). In this case, the remaining team is more likely to achieve harmonious decisions with respect to whether to recruit a new member. Thus, changes in the psychology of remaining team members differentiate the replacement of an EFT member (new member entry after founder departure) from a new member entry without prior founder departure. Therefore, I conjecture that founder crowd-out and founder departure, and new member entry and replacement should be distinguished because they are affected by different factors.

3.2.2 Equity ownership, founder departure and crowd-out

Previous researchers have investigated and documented antecedents of entrepreneurs' departure (Boeker & Karichalil, 2002; DeTienne, 2010; DeTienne & Cardon, 2012; Parastuty et al. 2016; Ucbasaran et al., 2003; Wennberg & DeTienne, 2014). They identify several factors that affect team turnovers, such as team size and heterogeneity of socio-demographic factors. However, these studies pay little attention to the effect of founders' equity ownership on EFT evolution.

Typically, EFT members hold partial or entire ownership of their new venture (Wasserman, 2003; Zhou & Rosini, 2015). Owning equity in a venture is an important motivation to commence entrepreneurial activities (Wasserman, 2012) and to contribute to the venture (Ucbasaran et al., 2003). Moreover, EFT members' ownership augments their willingness to work together productively (Rosen & Quarrey, 1987). Team members benefit and lose the most when they carry considerable risk of the venture (Hall & Woodward, 2010). Equity ownership also

increases members' commitment to a venture and enhances psychological ownership (Buchko, 1992), and both psychological and equity ownership can influence founders' decision to depart (Breugst et al., 2015).

Thus, these studies imply that equity ownership is highly valued in the phase of new venture creation and then declines over time (DeTienne, 2010), which emphasises the significance of founders' equity ownership in the early phase of ventures. Accordingly, equity ownership should not be neglected when analysing the factors that attract entrepreneurs, in terms of rewarding their effort (Cooney, 2005) and how they affect entrepreneurs' decision to exit, as well as their development and options for exit (DeTienne, 2010; DeTienne & Cardon, 2008).

Although Boeker and Karichalil (2002) show that the rate of founder departure decreases with founder ownership, their study was at the team level; therefore, their measurement of founder ownership pertains to the proportion of equity owned by founders collectively, and they focus on the proportion of equity held by founders and outside investors. On the individual level, having less ownership can lead to entrepreneurs who are less attached and committed to the venture and how the team works. The lower the emotional attachment to a team, the higher is the possibility that founders depart (Ucbasaran et al., 2003).

H1a: The founder's equity ownership is negatively related to the rate of their departure and crowd-out from the early phase of the venture.

DeTienne (2010) proposed that entrepreneur departure can result from identifying a new business opportunity or opting to pursue a better chance elsewhere (Bates, 2005; Loane et al., 2014). When such alternatives are perceived as more attractive, founders are more likely to depart (DeTienne, 2010; Ucbasaran et al., 2003). In addition, in the early stage of a venture, founders have not yet established a strong psychological commitment or invested resources in it.

Having alternatives can distract them from the focal venture, so the alternative opportunity is considered a primary reason for the founder departure (DeTienne,

2010), especially in the early stage of new ventures (Parastuty et al., 2016). The attractiveness of alternative entrepreneurial opportunities can be reflected by entrepreneurs' involvement: when entrepreneurs are both a shareholder and a manager in such an alternative, their attachment and commitment are greater than merely being an investor or a manager. Therefore, being an owner-manager in other companies should increase the likelihood of an entrepreneur's departure (DeTienne, 2010).

Pursuing alternative entrepreneurial opportunities by discontinuing or leaving successful ongoing firms may explain the phenomena of serial entrepreneurship, but not the portfolio entrepreneurship phenomenon in which they invest and hold stakes in more than one venture (Westhead and Wright, 1998). This paradox remains unsolved, so the hypothesis follows the mainstream theory. But it should also be possible that founders' alternative entrepreneurial opportunity may have no impact on their decision to depart an early-stage ongoing venture.

H1b: Having alternative entrepreneurial opportunities (concurrent holdings in other companies) is positively related to the rate of founders' departure and crowd-out in the early phase of the venture.

3.2.3 Ownership distribution and team evolution

The distribution of equity within a team can be a complicated and tension-filled decision for an entrepreneurial team (Wasserman, 2012), as ownership influences the power of entrepreneurs and groups in an organisation (Boeker & Wiltbank, 2005). An uneven ownership distribution can jeopardise the team's unity of purpose (Kroll et al., 2007).

Most prior research focuses on the effect of equity ownership distribution between managers and outside investors on team turnover (Breugst et al., 2015; Klotz et al. 2014), which does not account for the reality that entrepreneurial team members typically own the majority of equity in early-stage private ventures (Wasserman,

2003). In this scenario, the conflicts among agents decrease in importance, and the ownership distributed among team members becomes more crucial (Kroll et al., 2007).

Boeker and Karichalil (2002) propose that the rate of founding team turnover caused by founder departure should be lower in firms with low concentrated ownership distribution. Although they did not find supportive evidence in 78 early-phase semiconductor producers in Silicon Valley, their proposition is consistent with Kroll et al.'s (2007) claim that an evenly dispersed ownership enables members to achieve unity of purpose, function effectively, and pursue the focal venture's interest.

Similarly, Breugst et al.'s (2015) case study investigation of the impact of equity distribution on team interaction shows that low perceived justice of equity distribution generates a negative spiral in entrepreneurial team interaction over time in terms of team attraction and eventually leads to team member exit and undesirable levels of team and venture performance. Therefore, I hypothesise that the disparity of ownership distribution is positively related to founder departure.

That said, as mentioned previously, a new member entry is likely to generate new diversity in the team and could lead to affective conflicts among members (Amason & Sapienza, 1997). In this case, the higher the level of conflict within a team, the higher is the possibility that team members depart (Ucbasaran et al., 2003). In addition, the coordination thesis indicates the difficulties may be encountered when the team is diverse and unable to integrate different perspectives and backgrounds (Kim et al., 2005). The coordination difficulties may be more intense when adding a new team member. Thus, crowd-out may not be affected by the disparity of ownership distribution but rather by changes in team composition along with its characteristics, such as heterogeneity in experience and other features.

H2a: Disparity of ownership among team members is positively related to the rate of founders' departure, but not to that of founders' crowd-out.

The introduction of new members marks another milestone for teams and ventures (Forbes et al., 2006). Compared with the variety of explanations for founders'

departure, the reasons for introducing a new member in teams are consistent in prior studies: seeking resources (Forbes et al., 2006), needed skills or experience (Kim et al., 2005) and/or inheriting in the case of a family business (for a review, see Handler, 1994).

Although resources and skills can be accessed by hiring employees, recruiting new EFT members gives the team an edge in that new members have more incentives to leverage their human capital and improve venture performance (Ucbasaran et al., 2003). Doing so is essential for surviving, expanding and overcoming the disadvantages of smallness, newness and financial constraints in early-phase ventures (Forbes et al. 2006).

The scarcity of resources and capacities can be even more urgent to address in early-stage ventures when one or more founders depart. In this sense, a new member addition can be considered a measure of the venture's ability to overcome constraints. Hambrick and Crozier (1985) show that start-up ventures that successfully evolved to established firms had experienced some founder replacement. These firms did so with the aim to improve their managerial skill.

The introduction of new members requires the remaining members to give up or dilute part of their ownership and control. Giving up the ownership and control, even a portion, in the venture can be painful, like "giving up part of their 'baby'" (Lim et al., 2013: 53). However, this trade-off is necessary. Wasserman (2012) notes that a founder's refusal to give up ownership reduces the likelihood of attracting the resources the venture needs and its ability to pursue opportunities. To attract potential new EFT members and overcome the disadvantages of insufficient legitimacy and financial resources of early-stage ventures, EFTs can use equity ownership as a substantial incentive (Wasserman, 2012).

In addition to gaining human capital and financial resources, new ventures can gain non-financial resources, such as moral support (Kotha & George, 2012) and social-psychological needs (Forbes et al., 2006), by granting equities to new members. These

findings imply that EFTs make the decision to recruit a new member with the aim to expand the venture, exchanging for both financial and non-financial resources (Breugst et al., 2015) and/or passing the business to family members. So, although giving up and diluting ownership can be painful, teams are still likely to do so, regardless of the consideration of ownership or ownership distribution.

H2b: The disparity of ownership among team members has no relationship to the rate of a new member's entry and replacement in the early phase of the venture.

3.2.4 Ownership redistribution after evolution

The decision to distribute equity ownership among team members can be complex for an entrepreneurial team (Wasserman, 2012), particularly after experiencing the reformation of the EFT: the remaining members must redistribute and dilute the ownership. They may reconsider the strategy of equity ownership redistribution to prevent future exits (Patzelt et al., 2020), which may involve diluting an "acceptable" amount of equity to new members to recruit and motivate them. With founder departure and crowd-out, the follow-up ownership distribution can be more concentrated or dispersed to prevent further departure. After new member entry or replacement, the equity ownership distribution can be imbalanced if the remaining members do not use a contingent contract to specify other members' contributions to the venture (Wasserman, 2012).

Although the aforementioned propositions suggest a potential effect of team evolution on follow-up ownership distribution within teams, scant empirical research addresses the direction of ownership redistribution and which types of team evolution have effects on the discrepancy of ownership (Patzelt et al., 2020). The direction of and how equity distribution strategy changes remain valuable subjects to investigate, considering the positive effect of equal ownership distribution on ventures' performance at the initial public offering stage (Kroll et al., 2007). Therefore, I do not make a hypothesis and allow the data to make the connection between types of team evolution and equity distribution.

3.3 Sample and Methodology

3.3.1 Sample

The sample is collected from Orbis – Bureau van Dijk. I first filtered for ventures that were private limited corporate entities and incorporated in 2010. Then, because my interest is in EFT-created ventures, the sample was narrowed down by filtering owners who are individuals and managers. These criteria gave me 235,328 U.K. ventures. The final sample is obtained by first randomly sorting the full list of ventures and then manually checking whether the ventures were founded by more than one entrepreneur in the order they appeared in the randomly sorted list.

I used two criteria to identify EFT founders as defined in Ucbasaran et al. (2003): (1) they owned at least 10% of the equity in the venture, and (2) they held a key role in the strategic decision making of the venture. In my case, if one entrepreneur had equity ownership equivalent to or greater than 10% in 2010 and was a senior manager, he or she is considered a founder. When more than one founder was observed in the year of incorporation (i.e., 2010), the venture was included in the sample until reaching 1,000 ventures, meaning 1,000 EFTs[35]. For all EFTs, I tracked them until 2019, including ventures that dissolved. The ten-year cut-off (2010–2019) allows my sample to include new ventures at their early stage (Beckman et al. 2007).

As for new members, when they appeared in both the shareholders and director/senior management list and owned at least 10% of the equity in the venture before or in 2019[36]. Given the randomness of the sample selection, the sample is considered to

[35] After the full sample was collected, I checked and found 20 founders who had concurrent holdings in more than one venture that were included in the sample. One departed from all ongoing ventures, two departed from one venture, and other ventures dissolved; only one departed from one venture while continuing as owner-manager in the other. The rest of the 16 founders had not departed from the ongoing ventures. The concurrent holding takes these holdings into account, meaning that these founders had concurrent holdings in 2010 at the entrepreneur level. Although I surmise that these exceptional cases will not lead to biased conclusions, these cases were excluded as a robustness test and found similar results.

[36] Such relaxation of the 10% restriction is realistic because new members may not be distributed a significant amount of ownership in the first year of entry but may be distributed or acquired more and reached the threshold in the following years.

constitute a representative sample of the entire population. At the same time, the final sample size of 1,000 entrepreneurial teams is expected to be sufficiently large to ensure reliable statistical inference.

To calculate the team-level characteristics, such as disparity of ownership distribution, heterogeneity of team characteristics and co-work history, the data was first collected at the entrepreneur level, including all founders' and new members' information (i.e., name, age, gender, nationality, equity ownership, their position in the venture, entrepreneurial experience before entering in the sampled venture, senior managerial experience before entering in the sampled venture, the experience of dissolving a venture before entering in the sampled venture, the experience of co-work with other team members in the focal team, and concurrent holdings in other ventures in years when they were owners and managers in the focal ventures). Then, I calculated the following team-level characteristics: disparity of equity ownership distribution, the heterogeneity of age, gender, family, managerial experience, entrepreneurial experience, function and team familiarity. Last, the total assets and industry of the focal ventures were collected.

3.3.2 Variables of interest

Dependent variables

At the founder level, I was interested in the probability of founder departure and founder crowd-out, conditional on the duration of ten years. Founder departure is defined as an entrepreneur who was in the initial EFT and quit being both manager and shareholder from the ongoing venture[37], as well as when an entrepreneur quit being a shareholder from the ongoing venture. Founder crowd-out is defined as founder departure after a new member entry.

[37] Compared to the exit by closing poor-performance ventures, departure from ongoing ventures is considered proactive and planned departure exit strategies, which may be successful regardless of the exit. This type of exit strategy is "a proactive strategic decision entrepreneurs make, it is important to study what factors influence that decision" (DeTienne & Cardon, 2008: 8).

At the team level, the analyses were for: (1) the probability of four evolutionary events occurred, conditional on the duration of ten years, (2) disparity of ownership distribution after the team evolution, captured by calculating the range of largest and smallest proportion of shares owned by team members in a given team each year. The four interested team evolutionary events were based on founder departure, founder crowd-out, new member entry and replacement (i.e., new member entry with prior founder departure or crowd-out).

Variables of interest

For explanatory variables, the entrepreneur-level variables were first considered. This study is interested in the founders' equity ownership in the sampled ventures and whether they have alternative entrepreneurial opportunities (simultaneously owned and managed other companies).

Accordingly, a continuous variable was created for founder's ownership that is greater than 0.1 and less than 0.9 in 2010, and greater than zero and equivalent to or less than 1 in the following years. And new members' equity ownership is greater than zero and equivalent to or less than 1 after their entry. In addition, an indicator variable was created, *entrepreneur's concurrent holdings*, which measures whether an entrepreneur owns at least 10% and manages other ventures in the years when he or she owned and managed the sampled venture. It represents their alternative entrepreneurial opportunities.

Control variables

Control variables included entrepreneurs' age (*entrepreneur age*), gender (*male entrepreneur*)[38], nationality (*foreign entrepreneur*), managerial experience before entering the focal venture (*managerial experience*), entrepreneurial experience before entering the focal venture (*entrepreneurial experience*) and whether the entrepreneur

[38] Controlling for the gender and age is following the study of Rocha et al. (2015) who investigates the nascent entrepreneur's entry and exit.

dissolved any venture before entering the focal venture (*dissolution experience*). In addition, in line with Ucbasaran et al.'s (2003) and (Patzelt et al., 2020) 's implication of the importance of past joint experience among members before the focal venture, an indicator variable was introduced to identify whether a founder once owned and managed other ventures with other cofounders in the focal venture before 2010 (*co-work experience*).

With regard to the team- and venture-level characteristics, this study focused on the effect of ownership distribution on team evolution. The distribution of ownership was captured by calculating the range of the largest and smallest proportion of shares owned by team members in a given team each year. Furthermore, I controlled for the number of remaining founders (*team size*) and heterogeneity of existing members' age (*H_age*), gender (*H_gender*), nationality (*H_nation*), family status (*H_family*), senior managerial experience (*H_mexp*), entrepreneurial experience (*H_entexp*), the average of experience that each member has engaged in other ventures with other cofounders in the focal venture (*team_familiar*) and functional background (*H_function*). In addition, the venture's size[39] and industry fixed effects were included.

The *H_age* variable is based on the continuous variable *age*. I followed Westphal and Zajac's (1995) measurement, using the coefficient of variation, to measure the heterogeneity. The value of age heterogeneity reduces with time passing if an EFT experienced no evolution: the larger the value, the more heterogeneous is the remaining team. For other categorical variables such as *H_gender* (female/male), I calculated them using Blau's (1977) heterogeneity index, defined as $H = 1 - (\sum P_i)^2$, where P is the proportion of team members in a category and i is the number of different categories represented in the team. For example, *H_gender* is calculated as *P,*

[39] Controlling for the fixed effects of firm size is following the study of Rocha et al. (2015: 71) who stated that "prospective entrepreneurs may choose a job in a small firm, aiming at developing more diversified skills by engaging in broadly defined tasks, to then leave and establish (or acquire) their own business." The "small firm effect" was captured and categorized by dummy variable, based on the number of employees, in Rocha et al. (2015), while the limitation in the number of employees forced this study to use the natural logarithm of total assets as an alternative measurement for the size effect.

the proportion of team members in the category of male or female. The same approach was used for calculating the heterogeneity of family status (*H_family*), nationality (*H_nationality*), senior managerial experience (*H_mexp*), and entrepreneurial experience (*H_entexp*).

Specifically, *H_family* determines heterogeneity of members' family status. Whether members are from the same family depends on their surnames, as the methodology used in Kotlar et al. (2018). The more distinct family names appear in a team, the more categories are observed, which makes a larger heterogeneous team in terms of family status. For functional heterogeneity (*H_function*), categories in Ucbasaran et al. (2003) are used : (1) general management, (2) sales/marketing, (3) production and (4) finance. Last, the average of team members' *co-work experience* is used to measure team familiarity (*Team_familiar*). The value is between 0 and 1, as *co-work* is an indicator variable. Detailed information about the variables is available in Appendix 3.1.

3.3.3 Methodology

Multivariate regressions were applied to examine the hypotheses. First, at the founder level, the survival time model – Cox proportional hazard model is employed as in Boeker and Karichalil's (2002) study. All founders were at the time at risk of evolving in 2010. The Cox proportional hazard model allows me to investigate both whether and when the event of interest happened. Compared with the logit model Ucbasaran et al. (2003) use, this model estimates time-varying coefficients more effectively and handle the censoring issue considering the observation period. It means that founders who did not leave over the entire observation period (from 2010 to 2019) were coded as 0 and considered right-censored. The following codes were used for the events of interest: founder departure (value = 1) and founder departure after new entry (crowd-out) (value = 2).

The same approach was employed to examine the team-level evolutionary events. All EFTs are at the time at risk of evolving in 2010. The following codes were used for

the events of interest: team evolution caused by founder departure (value = 1), team evolution caused by founder crowd-out (value = 2), team evolution caused by new team member entry (value = 3) and team evolution caused by replacement (value = 4). All founders and teams were coded as 5 after ventures ceased to be independent entities (i.e., they were liquidated or sold) and dropped these teams from the sample. Note that the values were to distinguish the events; they have no ordinal meaning.

As for the results, the Cox proportional hazard model reports hazard ratios, rather than coefficients: hazard ratios greater than 1 suggest that the variable increases the rate of events of interest, such as entrepreneur's departure and team evolution through founders' departure, and hazard ratios less than 1 suggest that the variable decreases the rate of events of interest.

Second, DPD analysis was employed using the system generalised method of moments (GMM) estimation to examine the relationship between ownership distribution after team evolution. This study aimed to determine how different evolutionary events in the early-stage venture affect the follow-up equity distribution. This model is well suited for fewer periods and a large number of teams, as in my case. The predicted variable (the disparity of ownership distribution) is dependent on its past realisations, and independent variables are not strictly exogenous (Roodman, 2009), which fits my settings that fixed team characteristics have the potential to affect the dependent variable. The multivariate specification is as in Equation C:

$$Disparity\_ownership_{it} = \alpha_0 + \alpha_1 Disparity\_ownership_{it-1} + \alpha_2 Disparity\_ownership_{it-2} + \alpha_3 Team\ evolution_{it-1} + \alpha_4 Team\ evolution_{it-2} + \alpha_5 Team\ evolution_{it-3} + \alpha_6 Controls_{it}^{T} + \alpha_7 Z_t + \varepsilon_{it}$$

(Equation C)

in which $Disparity\_ownership_{it}$ is the disparity of ownership distribution in a team *i* in time *t*. The two lags, $Disparity\_ownership_{it-1}$ and $Disparity\_ownership_{it-2}$ capture the persistence of the disparity of ownership distribution over two lagged periods and take into account any serial correlation. *Team evolution* represents five indicator

variables, including general team evolution, founder departure, crowd-out, new entry and replacement. $Controls_{it}^{T}$ represents a matrix of control variables for the teams. Finally, Z_t is the vector for time dummies, and ε_{it} represents the random error term.

3.4 Empirical Results

3.4.1 Entrepreneur-level results

At the founder level, 2,189 founders were involved in venture incorporation, and the maximum number of founders in a team is 6. Over ten years, 188 founders departed from ventures entirely, and 31 founders stepped down as shareholders but continued managing the ventures. Eighty new entrepreneurs entered after 2010. The random sample captured various types of team evolution, even in the early stage of the venture.

Table 3.1 reports the descriptive statistics of variables for entrepreneurs in the year they entered into the scope (i.e. the founder in 2010 and new members statistics in the year they entered into the scope). The correlation matrix in Appendix 3.3 suggests no severe correlation between the ownership of the entrepreneur, alternative entrepreneurial opportunity and control variables, suggesting that multicollinearity is less likely to be a severe issue.

[Table 3.1 about here]

The statistics reveal that half the entrepreneurs were British males at their 44 years old when they started the sampled ventures. Half of them did not have an alternative entrepreneurial opportunity and held 50% of the equities of the focal venture. When decomposing all entrepreneurs into founders and new members, we can observe that new members were, in general, 2 years younger than founders and owned fewer equities than founders when they entered the sampled venture. In addition, the statistics indicate that new members are not expected to be more experienced in both management and entrepreneurship.

Table 3.2 presents the results from the survival analysis (Cox model) for the effect of equity ownership and alternative entrepreneurial opportunity (concurrent holdings) on the probability of founder departure and founder crowd-out. In other words, it suggests who departed from the teams and if their departure is conditional on prior new member entry. Model 2 shows the effect of founder's equity ownership on the rate of departure. The hazard ratio is less than 1, which suggests that the more equity owned by a founder, the less likely a founder left the venture. A similar effect is evidenced with respect to founder crowd-out (Model 5). In Model 1 and 4, the indicator variable for founders' alternative entrepreneurial opportunity is included. However, its effect only significantly increases the rate of founder crowd-out, but not founder departure.

The results suggest that the possibility that a founder left an EFT is decreased with the founder's equity ownership. At the same time, the founder's alternative entrepreneurial opportunity increases the possibility that the founder left an EFT who added a new member before. These findings remain the same when both equity ownership and alternative entrepreneurial opportunity are included. In short, the empirical evidence is in support of Hypothesis 1a. However, Hypothesis 1b is only partially supported.

[Table 3.2 about here]

3.4.2 Team-level results

There were 351 ventures dissolved during the observation period, in which 32 EFTs in these ventures experienced evolution. When only looking at the team level, 207 EFTs experienced at least one evolutionary event of interest in their early-stage ventures. When I scrutinised these teams, 175 of them experienced founder departure, 11 experienced founder crowd-out, 34 introduced new members and 29 introduced replacements.

Figure 3.1 is drawn after setting hazard estimates for different events and the time when the team evolution occurred. As observed, founder departure, new member entry and replacement occurred at very early stages of the ventures. The probabilities of founder departure and new member entry decreased with time, but founder departure had a higher prevalence than new member entry. These findings are consistent with DeTienne's (2010) proposition with respect to the high rate of exit in early-phase ventures. Replacement occurred early, but its prevalence stabilised over time. By contrast, crowd-out only came about in the later period of the early phase, between the sixth and eighth years.

Figure 3.1: Team evolution - hazards estimate

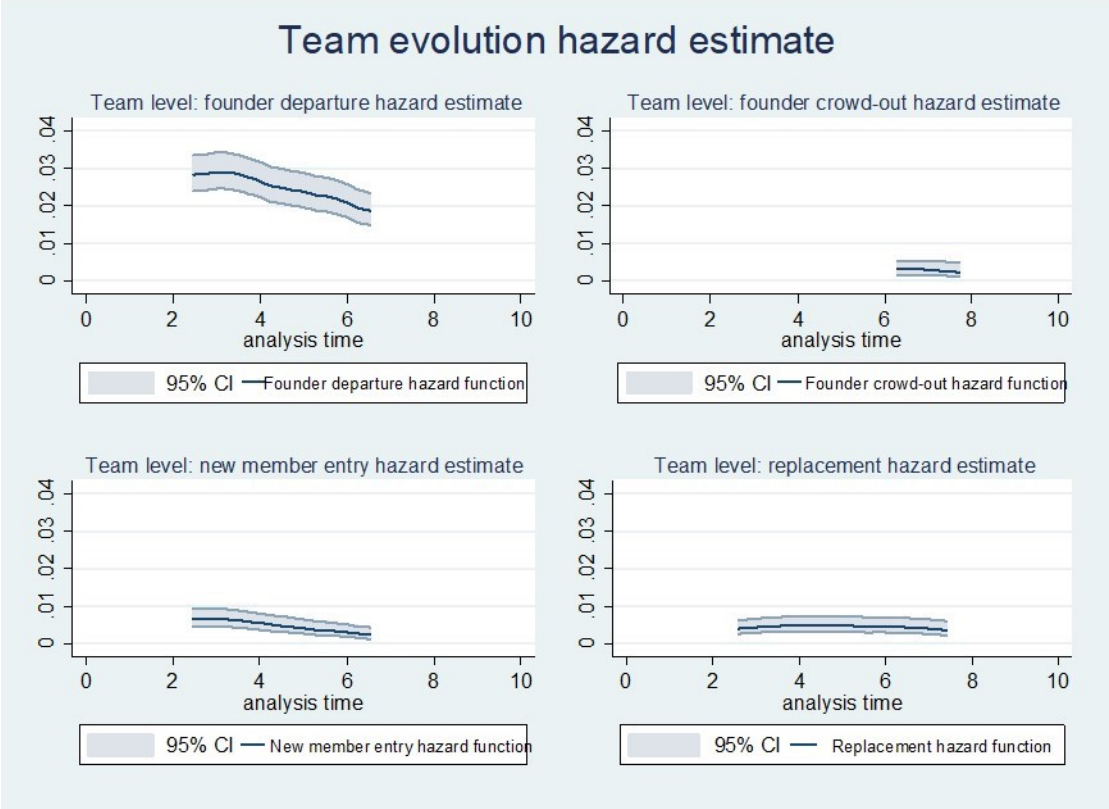

Table 3.3 reports the descriptive statistics of variables at the team level in 2010. It also compares the characteristics of evolved and non-evolved teams in 2010. Two-founder teams represented half the sample in 2010 and the early stage of ventures, which emphasises that the characteristics of the teams in this study are different from

those in prior studies with regard to team turnover in specific industries (e.g., Boeker & Karichalil, 2002; Ucbasaran et al. 2003).

The statistics also indicate that half the teams did not consist of only family members at the beginning, but the team-year statistics (Appendix 3.2) reveal the opposite trend with respect to the family status. Two reasons are expected to explain the discrepancy between these statistics.

First, more non-family firms were liquidated, meaning that the entire team exited during the early phase, and second, some ventures were not created by family members but evolved into family companies later on, suggesting the possibility that non-family members departed. According to the observation, the second reason is supported. The all-family-on-board teams have a higher ratio of survivorship (72.4%), while only did 57.6% of the counterpart survived in the first ten years of venture.

Teams that experienced at least one evolutionary event and those that did not experience any evolution were significantly different in the size of EFT, heterogeneity in age, gender, family, and team familiarity at the beginning of venture incorporation. The *p*-values of difference in means based on team-year observations (Appendix 3.2) suggest that significantly different characteristics of the team emerged with time and evolution. In addition, the correlation matrix in Appendix 3.3 suggests no severe correlation between ownership distribution and other control team characteristics at the team level, suggesting that multicollinearity is less likely to be a severe issue.

[Table 3.3 about here]

Table 3.4 reports the survival analysis at the team level for the role of ownership distribution in team evolution caused by founder departure, founder crowd-out, new member entry and replacement. The findings are consistent with Ucbasaran et al.'s (2003) that founding team size and family heterogeneity increase the probability of founder departure. The novel finding that team familiarity decreases the rate of founder departure corroborates the double life-cycle framework and indicates that past joint experience helps retain founders in the early phase. The heterogeneity in gender

prevents founders from departure, and logically, prevents a team from recruiting new members for replacement.

As for our variable of interest, the disparity of ownership distribution shows a significant and positive effect on the rate of founder departure. It suggests that the greater the disparity of ownership distribution, the more likely a founder departs from the ongoing focal venture. In contrast, the disparity of ownership distribution shows no effect on other evolutionary events. These findings are in support of Hypothesis 2a and 2b.

[Table 3.4 about here]

Then, the effect of team evolution on follow-up equity distribution among members was examined. Table 3.5 reports the results of regressing ownership distribution on one, two and three lags of team evolutionary events: general team evolution regardless of the types, founder departure, founder crowd-out, new member entry and replacement. The system GMM estimation was applied that contained one and two periods of lag of ownership distribution in the regressors. The results show a short-term effect of general team evolution on follow-up equity distribution; specifically, teams that experienced evolution, regardless of the type, decreased their disparity of ownership by 4% only in the following year. In other words, ownership was distributed more equally in the first year after the team evolved.

The results indicate that teams that experienced founder departure reduced the disparity of ownership by approximately 5.4% and 1.6% in the following year and the second year after, respectively, which implies that the ownership distribution became more dispersed two years after the founder departure but had no continuous effects in the third year. A negative effect is observed for crowd-outs, though they had shorter and less influence: the negative effect was 3.9% in the first year after. On the other hand, new member entry and replacements showed no significant effect on ownership distribution. These findings illustrate the different influences of four types of team

evolutionary events on ownership distribution strategy in terms of magnitude, duration and time.

To answer the question that if the temporal sequence of events makes a difference, one should compare the consequences of founder crowd-out and replacement. The empirical evidence indicates that the difference in the temporal sequence of evolutionary events leads to different outcomes. It also emphasises that the sequence of evolutionary events is essential when determining the imprinting effects of evolutionary events on a venture's prospect strategy setting.

[Table 3.5 about here]

3.5 Robustness Analysis

To check the robustness of prior findings, I conducted the following robustness analysis. First, an alternative measurement was considered for ownership distribution in teams. Instead of using *Disparity_ownership* among team members at the team level, I recalculated the mean absolute deviation of team members' ownership (*Dev_ownership*) in each year.

Table 3.6 Panel A displays the results at the team level and indicates the same conclusion I came to originally: ownership distribution reduces the rate of founder departure but not crowd-out, new entry and replacement. With regard to the consequence of evolutionary events, the conclusions remain the same except for the second-year effect of founder departure. Although the effect of founder departure in the second year after evolution on ownership redistribution disappears, the results still confirm the different effects when comparing founder crowd-out and replacement.

[Table 3.6 about here]

Third, as mentioned before, there are 20 of 2,189 founders who had concurrent roles in other ventures in the sample, though only one departed from one venture while continuing as owner-manager in the other. Although the results should not be biased due to such a sole case, a robustness check was still conducted by excluding these 20

founders from the sample (Table 3.7 Panel A). The findings are consistent with the prior conclusion that owning more equity ownership significantly reduces the rate of founders' departure and crowd-out. The concurrent holdings enhance the rate of founder crowd-out but not founder departure.

For team-level analysis (Table 3.7 Panel B), teams were excluded from the analysis when the founders created other ventures in the sample. The finding is robust that disparity of ownership distribution increases the rate of founder departure, but not other evolutionary events.

[Table 3.7 about here]

3.6 Discussion and Conclusion

The evolution of entrepreneurial founding teams (EFTs) has received growing attention from scholars, practitioners and policy makers. Embedded in the double life-cycle framework (Patzelt et al., 2020), this study examines the antecedents and consequences of different team evolutionary events in early-stage ventures. Building on implications observed from established firms, the temporal sequence of entrepreneurial events should be emphasised and valued. I conjectured that different sequences of events could have various psychological implications on entrepreneurs. This study sheds light on the complexity of team evolution and the different determinants for these four types of team evolution.

Although abundant research has focused on causes of founder departure and the imprinting effect of team evolution on venture development and performance, few studies have empirically shown equity ownership, alternative entrepreneurial opportunity (concurrent holdings) and ownership distribution as causes of founder departing from the team and then causing team evolution, and how this results in the strategic outcome of ownership redistribution strategic outcomes in early-phase ventures.

In addition, most studies focus on either founder departure or new member addition at the team level; this neglect of entrepreneur-level characteristics limits realising a fully fleshed-out picture. Studies have identified equity ownership as a motivation, which shows the rewards as well as the risks of being an entrepreneur. It influences an entrepreneur's psychological ownership, attachment and commitment to the venture.

To bridge these gaps, this study presents equity ownership and alternative entrepreneurial opportunity as antecedents of founder departure at the founder level. In particular, this study examined whether founders' departure from a focal venture can be predicted by their equity ownership in the focal venture and concurrent holdings in other ventures. This is the first study to statistically show the effect of equity ownership and alternative entrepreneurial opportunities on founders' decisions to depart.

Also, this study addresses whether different types of team evolution are influenced by the disparity of ownership distribution and how the equity is distributed in ventures after different types of evolution. The result shows that ownership distribution is shown to be a cause of team dissolution at the team level. As for consequence, a well-dispersed ownership redistribution is a short-term consequence of evolutionary events at the team level.

This study was conducted using a manually collected random sample comprised of 1,000 U.K. ventures founded by EFTs in 2010. The survival analysis (Cox proportional hazard model) was applied to determine the role of equity ownership and alternative entrepreneurial opportunity and that of ownership distribution in founder departure at both the entrepreneur and team levels. The results reveal that founders who owned fewer equities had a higher rate of departure and crowd-out. This finding corroborates previous findings that increasing equity ownership raises the attachment of founders to their focal venture. By contrast, alternative entrepreneurial opportunity (concurrent owning and managing other ventures) significantly increases the rate of founder crowd-out but does not affect founder departure. The results suggest that

founders are more likely to leave the ongoing venture when they have alternative opportunities elsewhere, and their team has a prior new member entry. In other words, this finding provides conditions to Ucbasaran et al.'s (2003) and DeTienne's (2010) propositions that alternative opportunities can explain why entrepreneurs depart from focal ventures conditional on prior new member entry. Future research should also consider additionally controlling for alternative employment opportunities, given that "a more attractive job leads to exit more often than another business opportunity" (Parastuty et al., 2016).

The statistics further show that new members are generally younger when they join the team than the founders who created the venture. Moreover, the majority of new members are not as experienced in management and entrepreneurship, which suggests that these nascent entrepreneurs start their entrepreneurial activity by joining an existing team. By doing so, they exchange their "sweat" for equity, experience and network. The data indicate that half these new members had no co-work experience with initial team members, which may cause substantial coordination difficulties and intense conflict after entry. In addition, they owned a lower proportion of equity ownership when they entered the team compared with founders who created the venture, which implies that founders decided to grant a small proportion of equity to new members at the beginning. I would advise caution in interpreting these results; however, given the limitation of settings in analysis, the antecedents for new member entry were not able to be measured at the entrepreneur level.

At the team level, this study demonstrates that the disparity of ownership distribution predicts the rate of founder departure. This finding indicates that the more dispersed the ownership is among team members, the lower is the rate at which founders depart. However, the role of ownership distribution appeared to be insignificant in explaining crowd-out, which suggests that a founder's decision to depart after a new member entry is more likely to be caused by founders' psychological or emotional factors than inequivalent equity distribution. I also find no evidence of the importance of ownership distribution in the introduction of new members or replacement in EFTs.

This finding implies that the decision to recruit a new member is not based on ownership distribution disparity but rather on the team and venture's characteristics.

Given different types of team evolution, the equity ownership among team members often must be redistributed, so the team must consider its strategy carefully. One or more remaining team members will acquire more equities after founder departure and crowd-out or give up part of equity ownership after new member entry and replacement. The follow-up ownership distribution may be more concentrated or equitable. Yet, no extant studies provide evidence showing the direction of ownership distribution after team evolution.

This study answered this question by running the dynamic model for DPD using system GMM two-stage estimation and detected the various influences of team evolution on follow-up ownership distribution with respect to magnitude, duration and time. In general, teams that experienced evolution decreased the disparity of ownership, meaning that the equity is more equally distributed among the team members, only in the year following the evolution. After distinguishing four types of team evolution, both founder departure and crowd-out had a positive effect on equal ownership distribution, but crowd-out had a greater effect. In addition, new member entry and replacement showed a significant impact on follow-up ownership distribution strategy only in the third year.

The observations and findings corroborate the double life-cycle framework regarding entrepreneurial teams and ventures: EFTs can be at the mature phase when they create new ventures, and teams can experience dissolution and/or reformation in early-stage ventures. This research illustrates the complex dynamic of EFT composition in early-stage ventures. By showing different causes of founder departure and crowd-out, as well as those of new member entry and replacement, this study signifies the importance of the sequence of evolutionary events in EFT-created ventures. Considering the imprinting effect of team evolution of early-stage ventures, future

research should examine different effects of evolutionary events on the rate of reaching financial milestones, such as attaining venture capital.

This study identifies the vital effect of equity ownership, alternative entrepreneurial opportunity and ownership distribution on retaining EFT members in early-stage ventures. When the evolution occurs as a result of founder departure and crowd-out, longer-term effects on follow-up ownership distribution strategy are evident. Thus, equity ownership can be viewed as a safeguard strategy to retain members on board, as the ownership is more evenly distributed.

If a new member is added to a team, founders should focus more on harmonising the team's interpersonal conflict and disentangling the coordination difficulties to keep the EFT from experiencing founder departure in early-stage ventures, as stability in a diverse team can facilitate the progress of building a successful venture (Kim et al., 2005). Moreover, the effects of different types of team evolution on equity distribution strategies should not be neglected because they can determine a member's decision to depart in subsequent stages of the venture.

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Table 3.1 Descriptive statistics at the entrepreneur-level

This table presents the descriptive statistics (obs., mean, SD, and median) for entrepreneur-level variables in their entry year: statistics on all entrepreneurs in the year they entered teams, founders in 2010 and new members in the year they entered teams. The *p*-value indicates the significant level of difference in means between founders and new members in terms of corresponding variables. All the variables are defined in Appendix 3.1.

	Full sample				Founders				New members				p-value
	N	mean	SD	median	N	mean	SD	median	N	mean	SD	median	
Entrepreneur age	2,213	43.698	11.204	43.000	2,134	43.792	11.214	43.000	79	41.152	10.678	41.000	0.040
Male entrepreneur	2,269	0.662	0.473	1.000	2,189	0.659	0.474	1.000	80	0.725	0.449	1.000	0.222
Foreign entrepreneur	2,240	0.093	0.291	0.000	2,160	0.094	0.291	0.000	80	0.088	0.284	0.000	0.856
Entrepreneur managerial experience	2,269	0.417	0.493	0.000	2,189	0.425	0.494	0.000	80	0.200	0.403	0.000	0.000
Entrepreneur entrepreneurial experience	2,269	0.350	0.477	0.000	2,189	0.357	0.479	0.000	80	0.163	0.371	0.000	0.000
Entrepreneur dissolution experience	2,269	0.186	0.390	0.000	2,189	0.19	0.392	0.000	80	0.088	0.284	0.000	0.021
Co-work experience	2,269	0.152	0.359	0.000	2,189	0.156	0.363	0.000	80	0.038	0.191	0.000	0.004
Entrepreneur concurrent holdings	2,269	0.315	0.464	0.000	2,189	0.315	0.465	0.000	80	0.313	0.466	0.000	0.966
Entrepreneur ownership	2,269	0.437	0.141	0.500	2,189	0.442	0.138	0.500	80	0.288	0.142	0.250	0.000

Table 3.2 Survival analysis: founder departure and crowd-out

This table reports the results from applying survival analysis (Cox hazard model) at the entrepreneur level for the effects of founder's equity ownership and concurrent holdings in other ventures on the rate of founder departure (Model 1-3) and crowd-out (Model 4-6). The hazard ratios are reported along with the robust standard errors that cluster by company in parentheses. *** $p < 0.01$.

	Founder departure			Founder crowd-out		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Entrepreneur age	0.989	0.990	0.990	1.004	0.997	1.007
	(0.007)	(0.007)	(0.007)	(0.035)	(0.035)	(0.036)
Male entrepreneur	1.211	1.246	1.259	0.413	0.568	0.409
	(0.206)	(0.215)	(0.215)	(0.217)	(0.311)	(0.223)
Foreign entrepreneur	1.071	1.114	1.125	2.724	4.194	4.098
	(0.265)	(0.276)	(0.280)	(2.109)	(3.824)	(3.308)
Entrepreneur managerial experience	1.439	1.451	1.464	1.869	1.965	1.614
	(0.391)	(0.394)	(0.400)	(1.729)	(2.090)	(1.621)
Entrepreneur entrepreneurial experience	1.021	0.923	0.991	0.427	0.561	0.300
	(0.332)	(0.294)	(0.326)	(0.449)	(0.653)	(0.372)
Entrepreneur dissolution experience	0.772	0.844	0.825	0.618	0.748	0.910
	(0.190)	(0.205)	(0.200)	(0.840)	(1.131)	(1.436)
Co-work experience	0.694	0.630	0.631	0.612	0.467	0.483
	(0.205)	(0.187)	(0.170)	(0.779)	(0.563)	(0.639)
Entrepreneur concurrent holdings	0.953		0.876	4.380**		4.932***
	(0.182)		(0.170)	(2.760)		(2.908)
Entrepreneur ownership		0.033***	0.032***		0.0002***	0.0001***
		(0.016)	(0.016)		(0.0004)	(0.0003)
Industry fixed effect	Included	Included	Included	Included	Included	Included
Venture size fixed effect	Included	Included	Included	Included	Included	Included
Wald chi-square	18.80	64.16	65.35	1497.20	1086.63	112.54
No. of observations	13,464	13,464	13,464	13,464	13,464	13,464
No. of subjects	1,851	1,851	1,851	1,851	1,851	1,851
No. of events	196	196	196	12	12	12

Table 3.3 Descriptive statistics at the team-level

This table presents the descriptive statistics (obs., mean, SD, and median) for team-level variables in 2010, teams who experienced different evolutionary events (Evolved team) and teams who did not experience any evolutionary events (Non-evolved team). The p-value indicates the significant level of difference in means between evolved teams and non-evolved teams in terms of corresponding variables. All the variables are defined in Appendix 3.1.

	Team-level				Evolved team				Non-evolved team				p-value
	N	mean	SD	median	N	mean	SD	median	N	mean	SD	median	
Team size	1,000	2.209	0.542	2.000	205	2.371	0.720	2.000	795	2.167	0.477	2.000	0.000
Disparity_ownership	1,000	0.088	0.189	0.000	205	0.106	0.202	0.000	795	0.084	0.186	0.000	0.128
H_age	945	0.12	0.128	0.074	198	0.139	0.134	0.096	747	0.115	0.127	0.069	0.024
H_gender	1,000	0.305	0.239	0.500	205	0.228	0.243	0.000	795	0.325	0.235	0.500	0.000
H_family	1,000	0.270	0.270	0.444	205	0.360	0.268	0.500	795	0.246	0.266	0.000	0.000
H_nation	955	0.043	0.138	0.000	198	0.049	0.148	0.000	757	0.041	0.135	0.000	0.459
H_mexp	1,000	0.153	0.226	0.000	205	0.176	0.232	0.000	795	0.147	0.224	0.000	0.105
H_entexp	1,000	0.147	0.223	0.000	205	0.168	0.228	0.000	795	0.141	0.222	0.000	0.132
H_function	1,000	0.228	0.333	0.000	205	0.213	0.338	0.000	795	0.232	0.332	0.000	0.469
Team_familiarity	1,000	0.147	0.344	0.000	205	0.097	0.277	0.000	795	0.160	0.358	0.000	0.018

Table 3.4 Team-level: ownership distribution and team evolution

This table reports the results for the results from applying survival analysis (Cox hazard model) at the team level for the effect of the disparity of ownership distribution on the rate of the evolutionary events resulting from founder departure (Models 1), founder crowd-out (Model 2), new member entry (Model 3) and replacement (Models 4). The hazard ratios are reported along with the robust standard errors that cluster by company in parentheses. All the variables are defined in Appendix 3.1. *** $p < 0.01$, ** $p < 0.5$ and * $p < 0.1$.

	Founder departure	Founder crowd-out	New member entry	Replacement
Team size	1.403***	1.310	1.378*	0.041***
	(0.163)	(0.571)	(0.252)	(0.020)
H_age	2.752	622.5176**	0.524	51.338*
	(1.710)	(1780.004)	(0.824)	(110.310)
H_gender	0.368**	2.800	0.444	1.652
	(0.145)	(2.834)	(0.392)	(1.572)
H_family	2.713***	208.122*	5.327**	29.638***
	(1.020)	(620.135)	(3.913)	(35.840)
H_mexperience	0.666	1.015	3.374	10.093*
	(0.370)	(1.742)	(3.227)	(12.227)
H_entexp	0.906	4.213	0.913	0.145*
	(0.503)	(5.020)	(0.907)	(0.167)
H_nationality	1.417	10.912	0.464	1.449
	(0.768)	(15.877)	(0.584)	(1.757)
H_function	0.960	1.476	0.885	1.145
	(0.220)	(1.150)	(0.533)	(0.887)
Team_familiarity	0.405***	0.351	0.857	1.315
	(0.117)	(0.439)	(0.531)	(0.651)
Disparity_ownership	1.887*	0.691	2.843	1.315
	(0.645)	(1.114)	(2.296)	(1.092)
Industry fixed effect	Included	Included	Included	Included
Venture size fixed effect	Included	Included	Included	Included
Wald chi-square	88.55	57.80	65.18	2442.53
No. of observations	6,344	6,344	6,344	6,344
No. of subjects	816	816	816	816
No. of events	171	12	35	30

Table 3.5 Ownership distribution after team evolution

This table reports the results from applying the dynamic model with two-step system generalised method of moments specifications for panel data (DPD), in which the dependent variable is *Disparity_ownership*, and the variables of interest are the one-, two- and three-year lagged indicator variables for general team evolution, founder departure, crowd-out, entry and replacement. These results included but did not report one- and two-lagged *Disparity_ownership* in the regression. Unreported control variables include *Team size*, *H_age*, *H_gender*, *H_family*, *H_nationality*, *H_mexperience*, *H_entre_exp*, *H_function* and *Team_familiarity*. The instrumented variables are one- and two-lagged *Disparity_ownership* and one lagged team evolution indicators. The instruments are one and two lagged instrumented variables for the transformed equation and lag 1 for the levels equation. Two lagged control variables were used for instrumental variables. The robust standard errors are reported in parentheses. All the variables are defined in Appendix 3.1. *** $p < 0.01$, ** $p < 0.5$ and * $p < 0.1$.

	Model 1	Model 2	Model 3	Model 4	Model 5
Lag team evolution (1)	-0.040**				
	(0.015)				
Lag team evolution (2)	-0.010				
	(0.008)				
Lag team evolution (3)	-0.012				
	(0.007)				
Lag departure (1)		-0.051***			
		(0.015)			
Lag departure (2)		-0.014			
		(0.010)			
Lag departure (3)		-0.008			
		(0.009)			
Lag crowd-out (1)			-0.039**		
			(0.018)		
Lag crowd-out (2)			-0.005		
			(0.007)		
Lag crowd-out (3)			-0.002		
			(0.006)		
Lag entry (1)				-0.008	
				(0.021)	
Lag entry (2)				-0.004	
				(0.010)	
Lag entry (3)				-0.020	
				(0.014)	
Lag replacement (1)					-0.002
					(0.018)
Lag replacement (2)					0.003
					(0.024)
Lag replacement (3)					0.002
					(0.020)
Constant	0.003	0.005	0.005	0.004	0.003
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Control variables	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included
No. of observations	4,715	4,715	4,715	4,715	4,715
No. of teams	755	755	755	755	755
Wald chi-square	2534.93	2507.01	2574.85	1716.49	2388.67
Auto-correlation	$p = 0.434$	$p = 0.568$	$p = 0.536$	$p = 0.482$	$p = 0.508$
Overidentification test	$p = 0.186$	$p = 0.435$	$p = 0.234$	$p = 0.086$	$p = 0.440$
No. of instruments	67	67	55	67	67

Table 3.6 Robustness test: Alternative measurement of ownership distribution

Panel A: This table reports the results for the robustness test by applying survival analysis (Cox hazard model) at the team level for the effect of ownership distribution on the rate of four types of evolutionary events. Instead of using the range to measure disparity of ownership, the mean absolute deviation of ownership (*Dev_ownership*) in teams is recalculated. The hazard ratios are reported along with the robust standard errors that cluster by company in parentheses. All the variables are defined in Appendix 3.1. *** $p < 0.01$, ** $p < 0.5$ and * $p < 0.1$.

	Founder departure	Founder crowd-out	New member entry	Replacement
Team size	1.418*** (0.163)	1.306 (0.572)	1.387* (0.256)	0.041*** (0.255)
H_age	2.760 (1.708)	626.109** (1780.916)	0.554 (0.446)	50.806* (109.181)
H_gender	0.361** (0.143)	2.806 (2.841)	0.446 (0.397)	1.648 (1.575)
H_family	2.685*** (1.008)	206.651* (613.124)	5.282** (3.971)	28.998*** (35.250)
H_mexperience	0.664 (0.369)	1.022 (1.752)	3.368 (3.222)	10.071* (12.225)
H_entexp	0.906 (0.502)	4.230 (5.047)	0.910 (0.903)	0.145* (0.167)
H_nationality	1.423 (0.771)	10.916 (15.876)	0.465 (0.587)	1.433 (1.739)
H_function	0.954 (0.219)	1.474 (1.142)	0.892 (0.537)	1.142 (0.885)
Team_familiarity	0.404*** (0.117)	0.350 (0.435)	0.853 (0.528)	1.307 (0.645)
Dev_ownership	4.381** (3.098)	0.369 (1.271)	7.357 (12.524)	1.322 (2.780)
Industry fixed effect	Included	Included	Included	Included
Venture size fixed effect	Included	Included	Included	Included
Wald chi-square	89.44	57.37	57.26	3759.92
No. of observations	6,343	6,343	6,343	6,343
No. of subjects	816	816	816	816
No. of events	171	12	35	30

Panel B: This table reports the robustness test by applying the dynamic model with a two-step system generalised method of moments specifications for panel data (DPD), in which the dependent variable is the alternative measurement of ownership distribution (*Dev_ownership*), mean absolute deviation, and the variables of interest are the one-, two- and three-year lagged indicator variables for general team evolution, founder departure, crowd-out, entry and replacement. These results included but did not report one- and two-lagged ownership distributions in the regression. Unreported control variables include *Team size*, *H_age*, *H_gender*, *H_family*, *H_nationality*, *H_mexperience*, *H_entre_exp*, *H_function* and *Team_familiarity*. The instrumented variables are one- and two-lagged *Dev_ownership* and one lagged team evolution indicators. The instruments are one and two lagged instrumented variables for the transformed equation and lag 1 for the levels equation. Two lagged control variables were used for instrumental variables. The robust standard errors are reported in parentheses. All the variables are defined in Appendix 3.1. *** $p < 0.01$, ** $p < 0.5$ and * $p < 0.1$.

	Model 1	Model 2	Model 3	Model 4	Model 5
Lag team evolution (1)	-0.020**				
	(0.008)				
Lag team evolution (2)	-0.005				
	(0.005)				
Lag team evolution (3)	-0.007				
	(0.005)				
Lag departure (1)		-0.025***			
		(0.009)			
Lag departure (2)		-0.009			
		(0.008)			
Lag departure (3)		-0.005			
		(0.008)			
Lag crowd-out (1)			-0.013***		
			(0.004)		
Lag crowd-out (2)			-0.002		
			(0.003)		
Lag crowd-out (3)			-0.001		
			(0.003)		
Lag entry (1)				-0.006	
				(0.010)	
Lag entry (2)				-0.000	
				(0.006)	
Lag entry (3)				-0.007	
				(0.006)	
Lag replacement (1)					0.000
					(0.009)
Lag replacement (2)					0.003
					(0.011)
Lag replacement (3)					-0.002
					(0.008)
Constant	0.003	0.003	0.002	0.003	0.002
	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
Control variables	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included
No. of observations	4,715	4,715	4,715	4,715	4,715
No. of teams	755	755	755	755	755
Wald chi-square	2069.01	2870.22	2794.82	2003.55	2281.72
Auto-correlation	p =0.453	p = 0.586	p = 0.544	p = 0.429	p = 0.491
Overidentification test	p = 0.292	p = 0.418	p = 0.249	p = 0.060	p = 0.474
No. of instruments	67	67	55	67	67

Table 3.7 Robustness test: Subsample analysis

Panel A: This panel reports the robustness test by excluding founders who founded more than one company in the sample. The survival analysis (Cox hazard model) is applied as the main analysis (at the entrepreneur level) for the effects of entrepreneurs' ownership and concurrent holdings in other ventures on the rate of founder departure and crowd-out. The hazard ratios are reported along with the robust standard errors that cluster by company in parentheses. All the variables are defined in Appendix 3.1. *** $p < 0.01$, ** $p < 0.5$ and * $p < 0.1$.

	Founder departure	Founder crowd-out
Entrepreneur age	0.990	1.008
	(0.007)	(0.036)
Entrepreneur gender	1.238	0.424
	(0.212)	(0.229)
Entrepreneur nationality	1.153	4.210*
	(0.289)	(3.386)
Entrepreneur managerial experience	1.386	1.532
	(0.389)	(1.539)
Entrepreneur entrepreneurial experience	1.044	0.303
	(0.389)	(0.374)
Entrepreneur dissolution experience	0.824	0.939
	(0.203)	(1.493)
Co-work experience	0.627	0.457
	(0.186)	(0.613)
Entrepreneur concurrent holdings	0.916	5.221***
	(0.180)	(3.107)
Entrepreneur ownership	0.034***	0.0001***
	(0.017)	(0.0003)
Industry fixed effect	Included	Included
Venture size fixed effect	Included	Included
Wald chi-square	60.79	111.95
No. of observations	13,225	13,225
No. of subjects	1.818	1.818
No. of events	192	12

Panel B: This panel reports the robustness test by excluding ventures founded by entrepreneurs who founded other companies in the sample. The survival analysis (Cox hazard model) is applied as the main analysis (at the team level) for the effects of ownership distribution on the rates of four types of evolutionary events. The hazard ratios are reported along with the robust standard errors that cluster by company in parentheses. All the variables are defined in Appendix 3.1. *** $p < 0.01$, ** $p < 0.5$ and * $p < 0.1$.

	Founder departure	Founder crowd-out	New member entry	Replacement
Team size	1.333**	1.273	1.396*	0.038***
	(0.158)	(0.574)	(0.262)	(0.020)
H_age	3.489**	526.351**	0.505	16.548
	(2.160)	(1466.392)	(0.806)	(38.291)
H_gender	0.415**	2.572	0.447	1.754
	(0.164)	(2.564)	(0.398)	(1.658)
H_family	3.020***	230.146*	5.334**	30.363***
	(1.127)	(691.046)	(3.878)	(36.659)
H_mexperience	0.578	1.086	3.124	15.409**
	(0.315)	(1.815)	(2.943)	(19.636)
H_entexp	1.134	4.441	0.899	0.121*
	(0.607)	(5.123)	(0.895)	(0.142)
H_nationality	1.340	11.921*	0.528	0.816
	(0.742)	(16.782)	(0.661)	(0.970)
H_function	0.954	1.353	0.888	1.351
	(0.223)	(1.035)	(0.536)	(1.029)
Team_familiarity	0.390***	0.317	0.879	1.383
	(0.117)	(0.407)	(0.544)	(0.754)
Disparity_ownership	1.939*	0.743	3.859	1.605
	(0.711)	(1.205)	(3.291)	(1.613)
Industry fixed effect	Included	Included	Included	Included
Venture size fixed effect	Included	Included	Included	Included
Wald chi-square	87.70	57.30	53.88	206.59
No. of observations	6,166	6,166	6,166	6,166
No. of subjects	793	793	793	793
No. of events	166	12	34	27

Appendices

Appendix 1.1: Country, prevalently spoken official language(s) and linguistic features

Country	Prevalently spoken official language(s)	IF	FTR	LANG(x)
Albania	Albanian	0	Strong	1
Algeria	Arabic	1	Strong	3
Argentina	Spanish	1	Strong	3
Armenia	Armenian	0		2
Australia	English	0	Strong	1
Austria	German	0	Weak	2
Azerbaijan	Azerbaijani	1	Strong	3
Bahrain	Arabic	1	Strong	3
Bangladesh	Bengali	1		3
Belarus	Russian	0	Strong	1
Belgium	Dutch and French, German1			
Benin	French	1	Strong	3
Bolivia	Spanish	1		3
Bosnia and Herzegovina	Bosnian, Serbian and Croatian			
Botswana	English and Setswana	0		2
Brazil	Portuguese	1	Weak	4
British Virgin Islands	English	0	Strong	1
Bulgaria	Bulgarian	0	Strong	1
Burkina Faso	French	1	Strong	3
Burundi	Kirundi and French	1		3
Cambodia	Khmer	0		2
Canada1	English and French			
Chile	Spanish	1	Strong	3
China	Mandarin Chinese	0	Weak	2
Colombia	Spanish	1	Strong	3
Costa Rica	Spanish	1	Strong	3
Croatia	Croatian	0	Strong	1
Cyprus	Greek	0	Strong	1
Czech Republic	Czech	1	Strong	3
Denmark	Danish	0	Weak	2
Djibouti	French	1	Strong	3
Egypt	Arabic	1	Strong	3
Equatorial Guinea	Spanish	1	Strong	3
Estonia	Estonian	0	Weak	2
Ethiopia	Amharic	0		2
Finland	Finnish	0	Weak	2
France	French	1	Strong	3
Gabon	French	1	Strong	3
Gambia	English	0	Strong	1
Georgia	Georgian	1		3
Germany	German	0	Weak	2
Ghana	English	0	Strong	1
Gibraltar	English	0	Strong	1
Greece	Greek	0	Strong	1
Guinea	French	1	Strong	3
Guinea Bissau	Portuguese	1		3
Hong Kong S.A.R.	Cantonese	0		2
Hungary	Hungarian	0	Strong	1
Iceland	Icelandic	0		2
India	Hindi	1		3

Indonesia	Indonesian	0		2
Iran	Persian	0		2
Iraq	Arabic	1	Strong	3
Ireland	English	0	Strong	1
Israel	Hebrew	1		3
Italy	Italian	1	Strong	3
Jamaica	English	0	Strong	1
Jordan	Arabic	1	Strong	3
Kenya	English	0	Strong	1
Kosovo	Albanian	0	Strong	1
Kuwait	Arabic	1	Strong	3
Kyrgyzstan	Kyrgyz	0		2
Latvia	Latvian	1	Strong	3
Lebanon	Arabic	1	Strong	3
Lesotho	Sesotho	0		2
Libya	Arabic	1	Strong	3
Liechtenstein	German	0	Weak	2
Lithuania	Lithuanian	1	Strong	3
Luxembourg	Luxembourgish	0		2
Madagascar	French	1	Strong	3
Malawi	English	0	Strong	1
Malaysia	Malay	0		2
Mali	French	1		3
Malta	Maltese	0	Strong	1
Mauritania	Arabic	1	Strong	3
Mauritius	Mauritian Creole	1		3
Mexico	Spanish	1	Strong	3
Moldova	Romanian	0	Strong	1
Monaco	French	1	Strong	3
Mongolia	Mongolian	0		2
Montenegro	Montenegrin	0		2
Morocco	Arabic	1	Strong	3
Mozambique	Portuguese	1		3
Myanmar	Burmese	0		2
Namibia	English	0	Strong	1
Netherlands	Dutch	0	Weak	2
New Zealand	English	0	Strong	1
Nigeria	English	0	Strong	1
North Macedonia	Macedonian	0		2
Norway	Norwegian	0	Weak	2
Oman	Arabic	1	Strong	3
Pakistan	Urdu	1		3
Panama	Spanish	1	Strong	3
Papua New Guinea	English	0	Strong	1
Paraguay	Spanish	1	Strong	3
Peru	Spanish	1	Strong	3
Philippines	Phillipino	1		3
Poland	Polish	0	Strong	1
Portugal	Portuguese	1	Strong	3
Qatar	Arabic	1	Strong	3
Republic of Serbia	Serbian	1		3
Republic of the Congo	French	1	Strong	3
Romania	Romanian	0	Strong	1
Russia	Russian	0	Strong	1
S. Sudan	English	0	Strong	1
Saudi Arabia	Arabic	1	Strong	3
Senegal	French	1	Strong	3

Seychelles	French	1	Strong	3
Sierra Leone	English	0	Strong	1
Singapore	English and Chinese	0		2
Slovakia	Slovakian	1		3
Slovenia	Slovene	1		3
Somalia	Somali	1		3
South Africa	English	0	Strong	1
South Korea	Korean	0	Strong	1
Spain	Spanish	1	Strong	3
Sri Lanka	Sinhala	0		2
Sudan	Arabic	1	Strong	3
Sweden	Swedish	0	Weak	2
Switzerland	German, French and Italian			
Syrian Arab Republic	Arabic	1	Strong	3
Tajikistan	Tajik	0		2
Thailand	Thai	0		2
Togo	French	1	Strong	3
Tunisia	Arabic	1	Strong	3
Turkey	Turkish	1	Strong	3
Ukraine	Ukrainian	1		3
United Arab Emirates	Arabic	1	Strong	3
United Kingdom	English	0	Strong	1
United Republic of Tanzania	Swahili	1		3
Uruguay	Spanish	1	Strong	3
Uzbekistan	Uzbek	0		2
Vietnam	Vietnamese	0	Strong	1
Yemen	Arabic	1	Strong	3
Zambia	English	0	Strong	1
Zimbabwe	English	0	Strong	1

Appendix 1.2: Variable Descriptions and Sources

Denotation	Representation	Source
Dependent Variables		
Ln (N_SME)	The natural logarithm of the number of newly established private limited or sole proprietorship SMEs in which the owner is individual and is the manager.	BvD- Orbis
N_SME	The number of newly established private limited or sole proprietorship SMEs in which the owner is individual and is the manager. These data are collected for regression of regional-level entrepreneurial propensity.	
Variables of Interest		
IF	An indicator variable which equals 1 if the prevalently spoken official language contains inflectional morphology for the future tense and 0 for otherwise	WALS (2013) and https://cooljugator.com/ https://www.greekgrammar.eu/verbs.php and other sources for different languages
FTR	An indicator variable which equals 1 if the prevalently spoken official language is coded as strong future time reference language in Chen (2013)'s index and 0 for weak future time reference.	Chen (2013)
LANG(x)	The categorical variable of the linguistic feature. LANG1 represents the majorly spoken official language is categorized as non-IF and strong FTR. LANG2 represents the majorly spoken official language is categorized as non-IF and weak FTR or categorized as non-IF, but FTR categorization is missing from Chen (2013) FTR table. LANG3 represents the majorly spoken official language is categorized as IF and strong FTR or categorized as IF, but FTR categorization is missing from Chen (2013) FTR table. Note that since there is only Brazilian Portuguese categorized as LANG4, which is IF and weak FTR. The regressions do not	WALS (2013) and https://cooljugator.com/ https://www.greekgrammar.eu/verbs.php Other internet sources for different languages and Chen (2013) online FTR ratio (Appendix 1.1)

	contain this indicator variable.	
Macro Control Variables		
GDP PPP	Gross Domestic Production (GDP) purchasing power parity (PPP). GDP expressed in current international dollars converted by purchasing power parity (PPP) conversion factor.	The World Bank Group https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD
GDP growth	Gross Domestic Production growth rate. The annual percentage growth rate of GDP at market prices is based on constant local currency.	The World Bank Group https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG
Ln_pop	The natural logarithm of the total population of a country. The total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates.	The World Bank Group https://data.worldbank.org/indicator/SP.POP.TOTL
Unemployment	The share of the labour force that is without work but available for and seeking employment.	The World Bank Group https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
HDI	Human Development Index	United Nations development programme-Human development reports http://hdr.undp.org/en/data
EDB	Ease of doing a business score	https://www.doingbusiness.org/en/data/doing-business-score
Civil Law	An indicator variable which equals 1 if the country belongs to the civil-law tradition (French, German, and Scandinavian codes) and 0 for otherwise (namely, English common law)	LaPorta, Lopez-de-Silanes and Shleifer (2008) https://scholar.harvard.edu/shleifer/publications/economic-consequences-legal-origins
Entrepreneurial		

Ecosystem Control Variables		
Fin_access	Financing for entrepreneurs. The availability of financial resources (equity and debt) to small and medium enterprises (SMEs) (including grants and subsidies)	Global Entrepreneurship Monitor – Entrepreneurial framework conditions https://www.gemconsortium.org/data/key-nes
Gov_support	Governmental support and policies. The extent to which public policies support entrepreneurship - entrepreneurship as a relevant economic issue	
Tax_bureau	Taxes and bureaucracy. The extent to which public policies support entrepreneurship - taxes or regulations are either size-neutral or encourage new and SMEs	
Gov_program	Governmental programs. The presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal)	
Basic_training	Basic school entrepreneurial education and training. The extent to which training in creating or managing SMEs is incorporated within the education and training system at primary and secondary levels	
Post_training	Post school entrepreneurial education and training. The extent to which training in creating or managing SMEs is incorporated within the education and training system in higher education such as vocational, college, business schools, etc.	
Rd_transfer	R&D transfer. The extent to which national research and development will lead to new commercial opportunities and is available to SMEs	
Commerce_infra	Commercial and professional infrastructure. The presence of property rights, commercial, accounting and other legal and assessment services and institutions that support or promote SMEs	
Internal_dynamic	Internal market dynamics. The level of change in markets from year to year	
Internal_openness	Internal market openness. The extent to which new firms are free to enter existing markets	
Physic_infra	Physical and services infrastructure. Ease of access to physical resources (communication, utilities, transportation, land or space) at a price that does not discriminate against SMEs	
Cultural_norms	Cultural and social norms. The extent to which social and cultural norms encourage or	

	allow actions leading to new business methods or activities that can potentially increase personal wealth and income	
Robustness Check variables		
UA	Hofstede uncertainty avoidance score	Culture Dimension data matrix (2015). https://geerthofstede.com/research-and-vsm/dimension-data-matrix/
LT	Hofstede long-term orientation score	
PD	Hofstede power distance score	
IND	Hofstede individualism score	
MAS	Hofstede masculism score	
UK_law	Indicator variable for British law origin. which equals 1 if the country belongs to the British law origin and 0 for otherwise	LaPorta, Lopez-de-Silanes and Shleifer (2008) https://scholar.harvard.edu/shleifer/publications/economic-consequences-legal-origins
FR_law	Indicator variable for French law origin. which equals 1 if the country belongs to the French law origin and 0 for otherwise	
GE_law	Indicator variable for German law origin. which equals 1 if the country belongs to the German law origin and 0 for otherwise	
SC_law	Indicator variable for Scandinavian law origin. which equals 1 if the country belongs to the Scandinavian law origin and 0 for otherwise	
NBD	New business entry density. It is the number of newly registered corporations per 1,000 working-age people aged 15 to 64. Corporations are defined as private, formal sector companies with limited liability.	The World Bank Group (2020) https://www.doingbusiness.org/en/data/exploretopics/entrepreneurship

Appendix 1.3: Pairwise correlation

	1	2	3	4	5	6	7	8	9	10	11	12
1. Ln (N_SME)	1.000											
2. IF	-0.282***	1.000										
3. FTR	-0.306***	0.451***	1.000									
4. GDP_PPP	0.320***	-0.096***	-0.296***	1.000								
5. GDP_growth	-0.112***	-0.021	0.031	-0.067**	1.000							
6. Unemployment	0.008	-0.020	0.127***	-0.162***	-0.163***	1.000						
7. HDI	0.540***	-0.175***	-0.358***	0.745***	-0.118***	0.047	1.000					
8. EDB	0.560***	-0.293***	-0.432***	0.638***	-0.134***	-0.020	0.826***	1.000				
9. Civil_law	-0.017	0.321***	-0.129***	-0.056*	-0.045	0.035	0.065**	-0.145***	1.000			
10. Ln_pop	0.169***	0.084***	-0.133***	-0.203***	0.048*	-0.231***	-0.147***	-0.078***	-0.072**	1.000		
11. Fin_access	0.217***	-0.149***	-0.402***	0.344***	0.141***	-0.271***	0.289	0.421***	-0.275***	0.090*	1.000	
12. Gov_support	0.052	-0.090*	-0.154***	0.338***	0.173***	-0.227***	0.171***	0.303***	-0.117**	0.100**	0.499***	1.000
13. Tax_bureau	0.010	-0.165***	-0.254***	0.427***	0.164***	-0.289***	0.207***	0.403***	-0.097**	-0.199***	0.383***	0.643***
14. Gov_program	0.059	-0.010	-0.349***	0.543***	0.098**	-0.289***	0.427***	0.466***	0.046	-0.161***	0.467***	0.711***
15. Basic_training	-0.020	-0.229***	-0.291***	0.299***	0.061	-0.147***	0.205***	0.327***	-0.166***	-0.172***	0.488***	0.408***
16. Post_training	-0.138***	0.085*	-0.037	0.177***	0.096**	-0.265***	0.072	0.109**	-0.025	-0.088*	0.366***	0.452***
17. Rd_transfer	0.137***	-0.141***	-0.384***	0.576***	0.003	-0.245***	0.520***	0.436***	-0.025	-0.105**	0.604***	0.584***
18. Commerce_infra	0.153***	-0.099**	-0.292***	0.423***	-0.060	-0.088*	0.341***	0.407***	-0.141***	-0.284***	0.530***	0.297***
19. Internal_dynamic	0.214***	-0.306***	-0.150***	-0.159***	0.067	-0.070	-0.148***	-0.056	-0.034	0.370***0	0.202***	0.173***
20. Internal_openness	0.129***	-0.199***	-0.422***	0.407***	0.114**	-0.284***	0.289***	0.384***	-0.168***	-0.114**	0.554***	0.466***
21. Physic_infra	0.097**	-0.130***	-0.340***	0.447***	0.029	-0.242***	0.534***	0.563***	0.070	-0.192***	0.398***	0.355***
22. Cultural_norms	-0.130***	-0.068	-0.126**	0.151***	0.179***	-0.381***	0.066	0.260***	-0.397***	0.164***	0.443***	0.405***

Appendix 1.3: Pairwise correlation (Continued)

	13	14	15	16	17	18	19	20	21	22
13. Tax_bureau	1.000									
14. Gov_program	0.659***	1.000								
15. Basic_training	0.424***	0.390***	1.000							
16. Post_training	0.405***	0.535***	0.601***	1.000						
17. Rd_transfer	0.542***	0.749***	0.543***	0.595***	1.000					
18. Commerce_infra	0.426***	0.489***	0.480***	0.436***	0.588***	1.000				
19. Internal_dynamic	-0.090**	-0.160***	0.111**	-0.129***	-0.024	-0.199***	1.000			
20. Internal_openness	0.570***	0.608***	0.557***	0.468***	0.640***	0.620***	-0.084*	1.000		
21. Physic_infra	0.507***	0.493***	0.182***	0.177***	0.471***	0.432***	-0.063	0.388***	1.000	
22. Cultural_norms	0.398***	0.351***	0.528***	0.487***	0.405***	0.263***	0.108**	0.403***	0.200***	1.000

*** p<0.01, ** p<0.05, * p<0.1.

Appendix 1.4 Robustness test for FTR and the indicator variables of languages with alternative measurements of legal origins

Panel A: This panel represents the robustness test results for FTR by applying Tobit regression for panel data. The dependent variable is the natural logarithm of the number of SMEs recorded on country-level on Orbis from 2010 to 2018. The indicator variable of civil law is replaced by four indicator variables, namely the British (UK_law), French (FR_law), German (GE_law), and Scandinavian (SC_law) in Model (1), (2), (3) and (4), respectively. Unreported macro control variables are GDP PPP, GDP growth, unemployment, the human development index, and scores of ease of doing business. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)
FTR	-1.165	-0.072	-0.582	-1.741
	(1.279)	(1.243)	(1.180)	(1.469)
UK_law	0.778			
	(1.755)			
FR_law		-2.681**		
		(1.098)		
GE_law			2.848***	
			(1.076)	
SC_law				-1.911
				(2.148)
Constant	-13.942**	-11.320*	-13.905**	-13.327**
	(6.276)	(6.102)	(5.887)	(6.278)
Macro Control variables	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Observations	265	265	265	265
Number of groups	49	49	49	49
Wald chi2	45.86	54.45	56.11	46.81

Panel B: This panel represents the robustness test results for the indicator variables of weak perception of uncertainty and a strong preference to the present time (LANG1) by applying Tobit regression for panel data. The dependent variable is the natural logarithm of the number of SMEs recorded on country-level on Orbis from 2010 to 2018. The indicator variable of civil law is replaced by four indicator variables, namely the British (UK_law), French (FR_law), German (GE_law), and Scandinavian (SC_law) in Model (1), (2), (3) and (4), respectively. Unreported macro control variables are GDP PPP, GDP growth, unemployment, the human development index, and scores of ease of doing business. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)
LANG1	2.160**	1.233	1.382	1.720*
	(1.027)	(1.013)	(0.928)	(0.977)
UK_law	-1.367			
	(1.055)			
FR_law		-1.167		
		(0.945)		
GE_law			2.823***	
			(1.049)	
SC_law				0.586
				(1.782)
Constant	-12.164**	-10.738**	-11.397**	-12.201**
	(4.720)	(4.865)	(4.554)	(4.744)
Macro Control variables	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Observations	381	381	381	381
Number of groups	75	75	75	75
Wald chi2	48.10	49.03	56.14	46.68

Panel C: This panel represents the robustness test results for the indicator variables of weak perception of uncertainty and weak preference to the present time (LANG2) by applying Tobit regression for panel data. The dependent variable is the natural logarithm of the number of SMEs recorded on country-level on Orbis from 2010 to 2018. The indicator variable of civil law is replaced by four indicator variables, namely the British (UK_law), French (FR_law), German (GE_law), and Scandinavian (SC_law) in Model (1), (2), (3) and (4), respectively. Unreported macro control variables are GDP PPP, GDP growth, unemployment, the human development index, and scores of ease of doing business. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)
LANG2	-0.025	-0.285	0.034	-0.025
	(1.011)	(0.996)	(0.961)	(1.107)
UK_law	-0.581			
	(1.020)			
FR_law		-1.609*		
		(0.909)		
GE_law			3.013***	
			(1.059)	
SC_law				0.094
				(1.972)
Constant	-11.882**	-10.046**	-11.080**	-11.947**
	(4.906)	(4.910)	(4.666)	(4.899)
Macro Control variables	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Observations	381	381	381	381
Number of groups	75	75	75	75
Wald chi2	42.03	46.93	49.09	47.54

Panel D: This panel represents the robustness test results for the indicator variables of intense perception of uncertainty and a strong preference to the present time (LANG3) by applying Tobit regression for panel data. The dependent variable is the natural logarithm of the number of SMEs recorded on country-level on Orbis from 2010 to 2018. The indicator variable of civil law is replaced by four indicator variables, namely the British (UK_law), French (FR_law), German (GE_law), and Scandinavian (SC_law) in Model (1), (2), (3) and (4), respectively. Unreported macro control variables are GDP PPP, GDP growth, unemployment, the human development index, and scores of ease of doing business. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Variables	(1)	(2)	(3)	(4)
LANG3	-1.853**	-1.144	-1.396*	-1.636*
	(0.878)	(0.929)	(0.816)	(0.869)
UK_law	-1.155			
	(1.014)			
FR_law		-1.054		
		(0.976)		
GE_law			2.864***	
			(1.041)	
SC_law				-0.651
				(1.791)
Constant	-9.512*	-9.255*	-9.409**	-10.018**
	(4.884)	(4.886)	(4.665)	(4.864)
Macro Control variables	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Observations	381	381	381	381
Number of groups	75	75	75	75
Wald chi2	48.58	49.09	57.33	47.54

Appendix 1.5: Subsample robustness check

This table represents the results of Tobit regression for panel data. The dependent variable is the natural logarithm of the number of SMEs recorded on country-level on Orbis from 2010 to 2014 and from 2015 to 2018. Unreported macro control variables are GDP PPP, GDP growth, unemployment, the human development index, scores of ease of doing business, and the indicator variable of civil law. Unreported entrepreneurial ecosystem control variables include 12 variables of GEM NES entrepreneurial framework condition measures. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

	Subsample: 2010-2014					Subsample: 2015-2018				
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IF	-1.724**					-2.314**				
	(0.797)					(1.098)				
FTR		-1.442					-1.632			
		(1.265)					(1.396)			
LANG1			2.486***					1.704		
			(0.942)					(1.234)		
LANG2				-0.053					0.202	
				(1.003)					(1.229)	
LANG3					-2.019***					-1.902*
					(0.765)					(1.115)
Constant	-15.535***	-10.754	-18.003***	-17.128***	-14.672***	-4.442	-13.223*	-8.188	-8.087	-4.494
	(4.520)	(7.530)	(4.472)	(5.250)	(3.922)	(7.114)	(7.764)	(6.970)	(7.112)	(7.265)
Macro Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Entrepreneurial Ecosystem Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	208	139	208	208	208	173	126	173	173	173
Number of groups	66	43	66	66	66	58	41	58	58	58
Wald chi2	63.00	44.54	65.18	49.44	75.42	26.80	35.81	23.74	21.43	24.88

Appendix 2.1: Definition and sources of variables

Variable	Description and formula	Source
Entrepreneur-level variables:		
Habitual	Indicator variable for habitual entrepreneurs, which equals 1 if an entrepreneur created more than 1 company between 2010 and 2019, and 0 for single entrepreneurs.	
Portfolio	Indicator variable which equals 1 if an entrepreneur held more than one company between 2010 and 2019, and the number of overlapping years is equivalent to or more than 2 years; and if an entrepreneur created more than one company in 2010 are coded as portfolio entrepreneurs, even if the number of overlapping years is less than 2 years; 0 for otherwise.	
Serial	Indicator variable which equals 1 if an entrepreneur held more than one company between 2010 and 2019 and the number of overlapping years is less than 2 years; 0 for otherwise.	
Age of entrepreneur (start)	The age of entrepreneurs in 2010 when they created their first company.	BvD Orbis
Male entrepreneur (d)	Indicator variable for the gender of the entrepreneur, which equals 1 if the entrepreneur is a man, and 0 if a woman.	
Managerial experience (d)	Indicator variable for the entrepreneur's managerial experience before 2010, which equals 1 if the entrepreneur had a senior management position in other companies which they did not own before 2010, and 0 for otherwise.	
No. companies (start)	The number of companies that were created by the entrepreneur in 2010.	
No. companies (overall)	The total number of companies that were created by the entrepreneur between 2010 and 2019.	
No. non-family co-founders (start)	The number of non-family entrepreneur's partners/co-founders in the first company or companies in 2010. When the entrepreneur created more than one company in 2010, we added them up across the different companies as long as the founders are not the same. For instance, if the entrepreneur creates 3 companies with one partner in 2010, the total number of	BvD Orbis

	the entrepreneur's partners equals 1, while if the entrepreneur creates 3 companies with an different partner in each company in 2010, the total number of the entrepreneur's partners equals 3.	
No. family co-founders (start)	The number of entrepreneur's family members who participated in founding, purchasing, or inheriting the company in 2010 and were listed as shareholder in 2010.	
No. co-founders (start)	The total number of co-founders who participated in founding, purchasing, or inheriting the company in 2010 and were listed as shareholder in 2010.	
Age diversity (start)	The natural logarithm of the standard deviation of all co-founders' ages, including the considered entrepreneur (Ko et al., 2021). To avoid losing many observations due to sole proprietorships (where the entrepreneur is alone and thus standard deviation equals zero), we use the following specification for our calculation: $Age\ diversity = \ln(standard\ deviation\ of\ all\ founders' age + 1)$	
Gender diversity (start)	The gender diversity of all cofounders and entrepreneur. The Blau's heterogeneity index (1977) is calculated (Ko et al. 2021). The following specification is used for calculation: $H = 1 - \sum P_i^2$ For this index, *P* is the proportion of team members in a category, saying male/female, and *i* is the number of different categories represented in the team.	
Co-founder's entrepreneurial experiences (start)	The maximal number of co-founder's entrepreneurial experiences. For instance, an entrepreneur in the sample has three co-founders in total. One of the co-founders owned three companies before 2010, and the other two owned one company before 2010; the maximum number of entrepreneurial experience of co-founders is three.	
First company (d)	Indicator variable for the first company that entrepreneurs entered, which equals 1 if the company is the one that entrepreneur entered in 2010, and 0 for follow-up companies.	

Control variables:		
GDHI per head by region	The natural logarithm of the gross disposable household income per head by region of the first company in 2010. We first matched the city of the first company with the NUT3 code (Nomenclature of territorial units for statistics), then using NUT3 matching with LAU1 region (local administrative units) in the UK. With the LAU1 code, we obtain the value of GDHI per head.	Office for National Statistics UK
Full-time employee income by age	The natural logarithm of the income of full-time employee by age of entrepreneur in 2010.It is the median gross annual earnings in British pounds by age, regardless of location.	
Population	The natural logarithm of the number of usual residents by the first section of postcode of the first company in 2010. For instance, the postcode of a company is SO23 0LD, and we collect the number of usual residents of SO23. It is based on the census in 2011. The number of usual residents is recorded in persons for units.	
Company-level variables:		
Entrepreneur's ownership	Fraction of all outstanding shares that the entrepreneur owns in the company.	BvD Orbis
Company total assets	Total assets of company, in GBP.	
Company equity	Total shareholders' equity of company.	
Company liability	Total liability of the company, which is the sum of current liabilities and non-current liabilities.	
Company leverage	Book leverage of the company, i.e., the ratio of total liability over total assets.	
Company weight	The proportion of the total assets of entrepreneur's one company to that of all his/her companies. It is to divide the total assets in one company by the sum of total assets of all companies that are held by entrepreneurs. For habitual entrepreneurs, we calculate the sum (Shown in the formulas below). $Company\_weight_{j,t} = \frac{Total\ assets\ of\ entrepreneur_{i,j,t}}{Total\ assets\ of\ entrepreneur_{i,t}}$ In which	

	$Total\ assets\ of\ entrepreneur_{i,j,t} = Entrepreneur's\ ownership_{i,j,t} * company\ total\ assets_{j,t}$ and $Total\ assets\ of\ entrepreneur_{i,t} = \sum (Entrepreneur's\ ownership_{i,j,t} * company\ total\ assets_{j,t})$ where i, j and t represent entrepreneur, owned company and year, respectively. Note that we exclude entrepreneurs who have companies with missing information in any holding companies. It is to say that for habitual entrepreneurs, if there is any company having no information about total assets, there is no weight calculated.	
Entrepreneur's ownership (end)	The average fraction of shares that the entrepreneur owns in the company between 2017 and 2019.	
Company leverage (end)	The weighted average leverage of company between 2017 and 2019.	
Company total assets (end)	The weighted average total assets of company between 2017 and 2019. It reflects the total assets managed by entrepreneurs in each company in which entrepreneurs have stakes.	
Total assets of entrepreneur in each company (end)	The weighted average total assets owned by the entrepreneur in each company between 2017 and 2019. It is based on the entrepreneur's ownership and the company's total assets.	
Total assets of companies (first)	The total assets of companies for the first three operating years. For companies that were created or joined by entrepreneurs after 2010, for example, in 2012, the total assets of the company are for the year 2012, 2013 and 2014.	
Average total assets of companies (first)	The unweighted average of total assets of companies for the first three operating years.	
Entrepreneur's Decision proxies:		
Average	The average percentage of shares that an entrepreneur owns in all	

ownership (end)	companies from 2017 to 2019.	
Weighted leverage (end)	The winsorized weighted average leverage owned by entrepreneurs in all companies from 2017 to 2019. In which, the 5% of the observations in the highest values were winsorized, and the weighted average of leverage of entrepreneurs is calculated as follows: $Weighted\ leverage_{i,t}$ $= \sum company\_weight_{j,t} * [Entrepreneur's\ ownership_{i,j,t} * (^{company\ liability}/_{company\ total\ assets})_{j,t}] / \sum (company\_weight_{j,t})$ Note that if there is any company having no information about assets and the entrepreneur quit before 2017, there is no average leverage calculated on the level of entrepreneurs.	
Total assets of companies (end)	The natural logarithm of the average total assets of company or companies in which entrepreneurs had stakes between 2017 and 2019. The 5% of the observations in the highest values were winsorized. It reflects the total assets <u>managed</u> by entrepreneurs. Note that we exclude entrepreneurs who have companies with missing information in any holding companies.	
Total assets of entrepreneur (end)	The winsorized natural logarithm of the average total assets owned by an entrepreneur between 2017 and 2019. The 5% of the observations in the highest values were winsorized. It reflects the total assets <u>owned</u> by entrepreneurs. Note that we exclude entrepreneurs who have companies with missing information in any holding companies.	
High-growth entrepreneur (end)	The high-growth entrepreneur in terms of the total assets of companies (end). It is an indicator variable that equals 1 if the total assets <u>managed</u> by entrepreneurs is in the top (fourth) quartile, and 0 if the total assets <u>managed</u> by entrepreneurs is in the first, second and third quartile.	
Instrumental variables		
The percentage of habitual	$\frac{\text{The number of habitual entrepreneurs in age group (x)}}{\text{Total number of entrepreneurs in age group (x)}}$ The age is based on entrepreneur's age in 2010. There are in total 7 groups: 1) age<=20; 2) 20 <age<= 30; 3) 30<age<=40; 4)	

entrepreneurs by the groups of entrepreneur's age in 2010	40<age<=50; 5) 50<age<=60; 6) 60<age<=70 and 7) age>70.	
The percentage of habitual entrepreneurs by the postcode of companies in 2010	$\frac{\text{The number of habitual entrepreneurs in the same postcode (x)}}{\text{Total number of entrepreneurs in the same postcode (x)}}$ Considering that some habitual entrepreneurs have more than one company that was located in different postcodes in 2010, they are counted in the number of habitual entrepreneurs in more than one postcode.	
The percentage of habitual entrepreneurs by industry 2010	$\frac{\text{The number of habitual entrepreneurs in the same industry (x)}}{\text{Total number of entrepreneurs in the same industry (x)}}$ Considering that some habitual entrepreneurs have more than one company that operated in different industries in 2010, they are counted in the number of habitual entrepreneurs in more than one industry.	
Variables used in figures for yearly decision proxies:		
The ratio of survivorship of all entrepreneurs	The ratio of the number of entrepreneurs who had still held at least one company at the end of each year to the total number of entrepreneurs, i.e. 1000.	
The ratio of survivorship of all	The ratio of the number of active companies which were created in 2010, including ones that were sold by entrepreneurs, at the end of each year to the total number of companies in the same	

first companies	year.	
2010 company total assets	The yearly total assets of individual company which were created in 2010. Companies were excluded after being sold or liquidated.	
Total assets of entrepreneur in each company	The total assets owned by entrepreneur in each company each year.	
Total assets of entrepreneur	The sum of total assets owned by entrepreneur in all companies each year. If there is information missing for any one company's total assets in single or habitual entrepreneurs' holdings in a certain year, the entrepreneur's total assets are recorded as missing.	
Total liabilities of entrepreneur	The sum of total liabilities owned by entrepreneur in all companies each year. If there is information missing for any one company's total assets in single or habitual entrepreneurs' holdings in a certain year, the entrepreneur's total liabilities are recorded as missing.	

Appendix 2.2: Pairwise correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.Age of entrepreneur (start)	1																		
2.Male entrepreneur (d)	-0.022	1																	
3.No. companies (overall)	-0.112*	0.105*	1																
4.No. companies (start)	-0.039	0.036	0.349*	1															
5.Managerial experience (d)	0.137*	0.084*	0.113*	0.091*	1														
6.No. co-founders (start)	0.107*	-0.005	0.078*	0.239*	0.031	1													
7.No. non-family co-founders (start)	0.028	0.060	0.100*	0.211*	0.001	0.825*	1												
8.No. family co-founders (start)	0.143*	-0.105*	-0.025	0.077*	0.054	0.414*	-0.173*	1											
9.Gender diversity (start)	0.172*	-0.257*	-0.056	0.044	0.039	0.354*	0.030	0.569*	1										
10.Age diversity (start)	0.107*	-0.085*	0.025	0.098*	0.040	0.695*	0.434*	0.439*	0.446*	1									
11.Co-founder's entrepreneurial experiences (start)	0.007	-0.008	0.099*	0.189*	0.011	0.529*	0.518*	0.088*	0.042	0.273*	1								
12.GDHI per head by region	-0.002	-0.003	0.120*	0.026	0.086*	-0.031	-0.015	-0.032	0.027	0.015	-0.024	1							
13.National income by age	0.323*	-0.084*	-0.066*	-0.019	0.031	-0.037	-0.025	-0.024	0.086*	-0.081*	-0.018	-0.010	1						
14.Population	-0.014	-0.004	-0.030	-0.022	-0.109*	-0.066*	-0.060	-0.017	-0.017	-0.062	-0.061	-0.341*	0.032	1					
15.Average ownership (end)	-0.090*	0.121*	0.019	0.035	0.013	-0.450*	-0.308*	-0.287*	-0.347*	-0.448*	-0.138*	-0.026	0.002	0.041	1				
16.Weighted leverage (end)	0.022	0.025	0.025	0.009	-0.002	-0.204*	-0.122*	-0.140*	-0.137*	-0.146*	-0.061	-0.109*	-0.013	0.073*	0.381*	1			
17.Total assets of companies (end)	0.010	0.002	0.252*	0.080*	0.029	0.260*	0.228*	0.082*	0.105*	0.182*	0.167*	0.112*	0.032	-0.095*	-0.279*	-0.493*	1		
18.Total assets of entrepreneur (end)	-0.025	0.046	0.209*	0.088*	0.016	0.081*	0.114*	-0.033	-0.020	0.021	0.114*	0.090*	0.041	-0.054	0.027	-0.382*	0.934*	1	
19. High-growth entrepreneur (end)	0.031	0.011	0.234*	0.082*	-0.018	0.251*	0.227*	0.069*	0.063	0.150*	0.187*	0.102*	0.035	-0.105*	-0.240*	-0.266*	0.731*	0.666*	1

* Significant level at 5%

Appendix 2.3: Extension to portfolio and serial entrepreneurs

Panel A: This panel presents the marginal effects of independent variables on portfolio and serial entrepreneur, based on multinomial Probit regressions. Note that the marginal effects are estimated by using the delta method and compared to the baseline classification of single entrepreneurs. 'Control variables' are GDHI per head by region, national employee income by age and population. All the variables are defined in Appendix 2.1. Significance levels reported based on robust standard errors: *** p<0.01, ** p<0.05, * p<0.1

Variables	Portfolio	Serial	Portfolio	Serial	Portfolio	Serial
Age of entrepreneur (start)	-0.003**	-0.002*	-0.004**	-0.002	-0.004***	-0.002
Male entrepreneur (d)	0.063**	0.007	0.103***	0.008	0.100**	0.009
Managerial experience (d)	0.112***	0.035*	0.122***	0.036*	0.121***	0.037*
Gender diversity (start)	0.007	0.004	0.030	0.006	0.027	0.036
Age diversity (start)	-0.021	-0.015	-0.018	-0.026*	-0.018	-0.024*
Co-founder's entrepreneurial experience (start)	0.042***	-0.005	0.049**	0.003	0.048**	0.003
No. co-founders (start)	0.040*	0.026*	0.032	0.023		
No. non-family co-founders (start)					0.032	0.022*
No. family co-founders (start)					0.034	-0.002
Control variables	NO	NO	YES	YES	YES	YES
Industry fixed effect	NO	NO	YES	YES	YES	YES
Observations	908	908	759	759	759	759

Panel B: This panel reports the results of the following regressions: 1) the average of entrepreneurs' ownership (the *average ownership (end)*) in their owned companies between 2017 and 2019, using Tobit regression with instrumental variables for portfolio and serial entrepreneurs, and with left-censoring at 0 and right-censoring at 1 (in A(1) and B(1)); 2) the average of entrepreneurs' company leverage (the *weighted leverage (end)*) in their owned companies between 2017 and 2019, using Tobit regression with instrumental variables for portfolio and serial entrepreneurs, and with left-censoring at 0 (in A(2) and B(2)); 3) the average of entrepreneurs' total assets managed (the *total assets of companies (end)*) in their owned companies between 2017 and 2019, using two-stage least squares (2SLS) of a linear regression and instrumental variables for portfolio and serial entrepreneurs (in A(3) and B(3)); and 4) the average of entrepreneurs' total assets owned (the *total assets of entrepreneur (end)*) in their owned companies between 2017 and 2019, using two-stage least squares (2SLS) of a linear regression and instrumental variables for portfolio and serial entrepreneurs (in A(4) and B(4)).
The instrumental variables are: 1) the percentage of habitual entrepreneurs by the groups of entrepreneur's age in 2010; 2) the percentage of habitual entrepreneurs by the postcode of companies in 2010; and 3) the interaction term of the percentage of habitual entrepreneurs by industry in 2010 and the percentage of habitual entrepreneurs by the postcode in 2010. Unreported 'Control variables' include entrepreneur's age in 2010; gender; indicator variable for entrepreneurs having managerial experience before 2010; national full-time employee's annual income by age; GDHI by administrative region; and population by company's location. All regressions include industry fixed effects that are based on the entrepreneur's first company/ies in 2010. All the variables are defined in Appendix 2.1. Significance levels reported: *** p<0.01, ** p<0.05, * p<0.1.

	Average ownership (end)		**Weighted leverage (end)**		**Total assets of companies (end)**		**Total assets of entrepreneur (end)**	
	A(1)	B(1)	A(2)	B(2)	A(3)	B(3)	A(4)	B(4)
Portfolio entrepreneur	-0.088	-0.508	0.074	0.066	1.373***	1.398***	1.400**	1.445***
Serial entrepreneur	0.148	2.642	-0.171	-0.019	-2.609	-3.248	-6.299	-7.450
Gender diversity (start)	-0.186*	-0.337	-0.068	-0.028	-0.079	0.065	-0.315	-0.023
Age diversity (start)	-0.062	-0.018	-0.020	0.013	-0.130	-0.133	-0.318	-0.321
Co-founder's entrepreneurial experiences (start)	0.021	0.043	-0.0002	0.001	0.074	0.067	0.047	0.036
No. co-founders (start)	-0.176**		-0.111		0.529		0.388	
No. non-family co-founders (start)		-0.232		-0.113		0.575		0.475
No. family co-founders (start)		-0.130		-0.149**		0.428*		0.180
Constant	2.844**	2.592	3.796	2.594	-6.576	-5.428	-1.570	0.626
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	759	759	623	623	623	623	623	623
R-squared	-	-	-	-	0.135	0.113	.	.

Panel C: This panel presents the marginal effects of independent variables on the top quartile of total assets managed by entrepreneurs at the end of observation period (2017-2019) using Probit regression with instrumental variables for portfolio and serial entrepreneurs. Top quartile of total assets managed by entrepreneurs is an indicator variable which equals 1 if the total assets managed by entrepreneur is at the first quartile, and 0 for otherwise. Note that the marginal effects are estimated by using the delta method. Unreported 'Control variables' are GDHI per head by region, national employee income by age and population. All the variables are defined in Appendix 2.1. Significance levels reported based on robust standard errors: *** p<0.01, ** p<0.05, * p<0.1

Variables	A(1)	B(1)	A(2)	B(2)
Portfolio entrepreneur	1.287**	1.406**	1.325**	1.338**
Serial entrepreneur	-6.788	-9.514	-7.035	-7.447
First company average assets (start)			0.296***	0.300***
Age of entrepreneur (start)	-0.004	-0.003	-0.006	-0.005
Male entrepreneur (d)	-0.031	-0.096	0.014	-0.006
Managerial experience (d)	-0.126	-0.131	-0.240	-0.231
Gender diversity (start)	-0.051	0.174	-0.312	-0.048
Age diversity (start)	-0.347	-0.396	-0.394	-0.378
Co-founder's entrepreneurial experience (start)	0.081	0.056	0.043	0.042
No. co-founders (start)	0.708		0.708	
No. non-family co-founders (start)		0.860		0.758
No. family co-founders (start)		0.607*		0.492*
Control variables	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES
Observations	623	623	623	623

Appendix 3.1 Definition of variables

Variables of interest	Definition
Team evolution	The following codes are used when defining events in the setting of Cox proportional hazard regression: Ventures that did not experience any changes in the team over the entire observation period (from 2010 to 2019) are coded as 0 and considered right-censored. Departure of a founder (code = 1). Founder departure after new member entry, defined as crowd-out (code = 2). Entry of a new team member (code = 3). New entry after departure, defined as replacement (code = 4). Ventures were coded as 5 if no initial team members remained, meaning that ventures were dissolved, in liquidation, or sold. These events are considered subjects exit from the experiment.
Disparity_Ownership	The difference between the largest proportion of equity and the smallest proportion of equity owned by entrepreneurs in the venture. Note that when only one member remained in the team, the disparity is 0.
Entrepreneur-level variables	
Entrepreneur age	Continuous variable indicating the age of entrepreneurs.
Male entrepreneur	Indicator variable that equals 1 if an entrepreneur is male and 0 if female.
Foreign entrepreneur	Indicator variable that equals 1 if an entrepreneur is not of British nationality or holds dual citizenship and 0 for British.
Entrepreneur managerial experience	Indicator variable that equals 1 if an entrepreneur was a senior manager but not a shareholder in other ventures before being owner-manager in the focal venture and 0 otherwise.
Entrepreneur entrepreneurial experience	Indicator variable that equals 1 if an entrepreneur was a senior manager and also owned at least 10% of shares in other ventures before being owner-manager in the focal venture and 0 otherwise.
Entrepreneur dissolution experience	Indicator variable that equals 1 if an entrepreneur had dissolved other ventures before being owner-manager in the focal venture and 0 otherwise.
Co-work experience	Indicator variable that equals 1 if a founder owned and managed ventures with the other cofounders before being owner-manager in the focal venture and 0 otherwise. For example, Jones, Brown and Smith are the current EFT members. Jones and Brown jointly owned and managed

	other ventures created before 2010, and Smith had no such joint experience with either. The values of co-work experience for Jones, Brown and Smith are 1, 1 and 0, respectively.
Entrepreneur concurrent holdings	Indicator variable that equals 1 if an entrepreneur is simultaneously a senior manager and also owned at least 10% of shares in other ventures. Note that this variable can be a yearly variate variable.
Entrepreneur ownership	The proportion of equities owned by the entrepreneur.
Team-level variables	
Team size	The number of remaining initial EFT members in teams.
H_age	The heterogeneity of remaining members' age, measured by the coefficient of variation: $H\_age = \frac{standard\ deviation\ (all\ team\ member's\ age)}{mean\ (all\ team\ member's\ age)}$
H_gender	The heterogeneity of members' gender, measured using Blau's (1977) heterogeneity index: $H = 1 - \sum P_i^2$ For this index, P is the proportion of team members in a category, say male/female, and i is the number of different categories represented in the team. Note that when only one member remained in the EFT, the heterogeneity is zero.
H_nation	The heterogeneity of members' nationality, measured similar to H_gender but replaced the categories with the U.K. and non-U.K. nationality. Note that when only one member remained in the EFT, the heterogeneity is zero.
H_family	I measured the heterogeneity of members' family status as H_gender. The categories depend on the number of family names of team members, and the family member is determined by the entrepreneur's family name. For example, if the family names in a team are McCoy, D'Monte and Biddlecombe, the heterogeneity of family status equals 0.667 ($1 - [(1/3)^2+(1/3)^2+(1/3)^2]$). In contrast, if the EFT has two members from the McCoy family and one from the Biddlecombe family, the heterogeneity of family status equals 0.444 ($1 - ((2/3)^2+(1/3)^2)$). The larger the value is, the more non-family members are on the team. Note that when only one member remained in the EFT, the heterogeneity is zero.

H_mexp	The heterogeneity of members' senior managerial experience measured similarly to H_gender but using the categories senior managerial experiences before being owner-manager in the focal venture and no such experience. Note that when only one member remained in the EFT, the heterogeneity is zero.
H_entexp	The heterogeneity of members' entrepreneurial experience measured similarly to H_gender, except using the categories entrepreneurial experiences before being owner-manager in the focal venture. Note that entrepreneurial experience is defined as holding 10% of the equity of a venture and being a manager in the venture.
Team_familiarity	Team familiarity; calculated using the average of members' *co-work experience*. The value is between 0 and 1. The greater the value is, the more familiar among team members in the focal team.
Control variables	
Venture size fixed effect	The size of the venture, a categorical variable with three classifications based on the natural logarithm of the venture's total assets in each year, and then I classified them by size. Note that to eliminate the effect of outliers, 5% of observations from the tail with the highest values are winsorised, and the classifications can change yearly.
Venture industry fixed effect	The industry of venture, a categorical variable that contains three types of industry according to the Nomenclature of Economic Activities Rev.2 sector code: (1) Information and communication (J), and Professional, scientific and technical (M); (2) Financial and insurance (K) and (3) other sectors.
Robustness test variables	
Dev_ownership	The mean absolute deviation of equity ownership in a team.

Appendix 3.2 Team-year descriptive statistics

This table presents the full-sample descriptive statistics (obs., mean, SD, min/max and median). The statistics are based on team-year observations. The *p-value* indicates the significant level of difference in means between evolved teams and non-evolved teams in terms of corresponding variables. All the variables are defined in Appendix 3.1.

	Full-sample						Evolved team			Non-evolved team			*p-value*
	N	mean	SD	min	median	max	N	mean	SD	N	mean	SD	
Team size	10,000	1.677	0.984	0.000	2.000	6.000	2050	1.760	0.933	7950	1.656	0.996	0.000
Disparity_ownership	10,000	0.073	0.180	0.000	0.000	0.998	2050	0.080	0.180	7950	0.071	0.180	0.034
H_age	7,647	0.098	0.115	0.000	0.055	0.707	1865	0.096	0.123	5782	0.098	0.112	0.570
H_gender	8,030	0.304	0.240	0.000	0.500	0.500	1918	0.168	0.231	6112	0.347	0.227	0.000
H_family	8,030	0.228	0.267	0.000	0.000	0.833	1918	0.263	0.287	6112	0.217	0.260	0.000
H_nation	7,739	0.039	0.131	0.000	0.000	0.500	1882	0.037	0.129	5857	0.039	0.132	0.565
H_mexp	8,030	0.15	0.224	0.000	0.000	0.500	1918	0.145	0.217	6112	0.152	0.227	0.212
H_entexp	8,030	0.141	0.22	0.000	0.000	0.500	1918	0.132	0.211	6112	0.143	0.223	0.045
H_function	8,030	0.218	0.328	0.000	0.000	1.386	1918	0.173	0.315	6112	0.232	0.331	0.000
Team_familiarity	8,030	0.134	0.329	0.000	0.000	1.000	1918	0.084	0.254	6112	0.149	0.348	0.000

Appendix 3.3 Pairwise correlation

Panel A: This panel represents a pairwise correlation matrix of all variables at the entrepreneur-year level. * 1% significance level.

	1	2	3	4	5	6	7	8	9
1. Entrepreneur age	1.000								
2. Male entrepreneur	0.009	1.000							
3. Foreign entrepreneur	-0.041*	-0.030*	1.000						
4. Entrepreneur managerial experience	0.178*	0.233*	-0.026*	1.000					
5. Entrepreneur entrepreneurial experience	0.160*	0.235*	-0.026*	0.856*	1.000				
6. Entrepreneur dissolution experience	0.151*	0.165*	-0.013	0.546*	0.635*	1.000			
7. Co-work experience	0.103*	0.077*	-0.051*	0.501*	0.583*	0.391*	1.000		
8. Entrepreneur concurrent holdings	0.044*	0.190*	0.016	0.452*	0.503*	0.252*	0.295*	1.000	
9. Entrepreneur ownership	-0.007	0.027*	0.010	-0.025*	-0.037*	-0.001	-0.079*	-0.067*	1.000

Panel B: This panel represents a pairwise correlation matrix of all variables at the team-year level. * 1% significance level.

	1	2	3	4	5	6	7	8	9	10
1. Team size	1.000									
2. Disparity_ownership	0.204*	1.000								
3. H_age	0.333*	0.057*	1.000							
4. H_gender	0.089*	0.117*	-0.144*	1.000						
5. H_family	0.358*	-0.035*	0.202*	-0.405*	1.000					
6. H_nation	0.063*	0.006	0.098*	0.001	0.201*	1.000				
7. H_mexp	0.213*	0.032*	0.178*	0.014	0.158*	0.104*	1.000			
8. H_entexp	0.195*	0.035*	0.137*	-0.003	0.164*	0.090*	0.741*	1.000		
9. H_function	0.131*	0.109*	-0.022	0.167*	-0.005	0.047*	0.083*	0.074*	1.000	
10. Team_familiarity	0.112*	-0.044*	-0.002	-0.088*	0.040*	-0.042*	-0.180*	-0.161*	-0.023	1.000